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

COMPREHENSIVE STORMWATER MANAGEMENT PERMIT

HIGH DENSITY DEVELOPMENT

SECTION 1 – APPROVAL

Having reviewed the application and all supporting materials, the City of Wilmington has determined that the application is complete and the proposed development meets the requirements of the City of Wilmington's Comprehensive Stormwater Ordinance.

PERMIT HOLDER: **GHK Cape Fear Development, LLC**
PROJECT: **Woodlands Landing at Echo Farms**
ADDRESS: **4114 Echo Farms Boulevard**
PERMIT #: **2019036**
DATE: **June 27, 2019**

Therefore, the above referenced site is hereby approved and subject to all conditions set forth in Section 2 of this approval and all applicable provisions of the City of Wilmington Comprehensive Stormwater Management Ordinance.

This permit shall be effective from the date of issuance until June 27, 2029 and shall be subject to the following specified conditions and limitations:

Section 2 - CONDITIONS

1. This approval is valid only for the stormwater management system as proposed on the approved stormwater management plans dated June 27, 2019.

2. The project will be limited to the amount and type of built-upon area indicated in Section IV of the Stormwater Management Application Form submitted as part of the approved stormwater permit application package, and per the approved plans.

3. This permit shall become void unless the facilities are constructed in accordance with the approved stormwater management plans, specifications and supporting documentation, including information provided in the application and supplements.

4. The runoff from all built-upon area within any permitted drainage area must be directed into the permitted stormwater control system for that drainage area.

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5. The permittee shall submit a revised stormwater management application packet to the City of Wilmington and shall have received approval prior to construction, for any modification to the approved plans, including, but not limited to, those listed below:
    a. Any revision to any item shown on the approved plans, including the stormwater management measures, built-upon area, details, etc.
    b. Redesign or addition to the approved amount of built-upon area or to the drainage area.
    c. Further subdivision, acquisition, lease or sale of any part of the project area.
    d. Filling in, altering, or piping of any vegetative conveyance shown on the approved plan.
    e. Construction of any permitted future areas shown on the approved plans.

6. A copy of the approved plans and specifications shall be maintained on file by the Permittee.

7. During construction, erosion shall be kept to a minimum and any eroded areas of the system will be repaired immediately.

8. If the stormwater system was used as an Erosion Control device, it must be restored to design condition prior to operation as a stormwater treatment device, and prior to issuance of any certificate of occupancy for the project.

9. All areas must be maintained in a permanently stabilized condition. If vegetated, permanent seeding requirements must follow the guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual unless an alternative is specified and approved by the City of Wilmington.

10. All applicable operation & maintenance agreements and easements pertaining to each stormwater treatment system shall be referenced on the final plat and recorded with the Register of Deeds upon final plat approval. If no plat is recorded for the site the operation and maintenance agreements and easements shall be recorded with the Register of Deeds so as to appear in the chain of title of all subsequent purchasers under generally accepted searching standards.

11. The stormwater management system shall be constructed in its entirety, vegetated and operational for its intended use prior to the construction of any built-upon surface unless prior approval is obtained. City Staff must be notified of any deviation prior to construction of the built-upon surface. Any deviation request shall include justification and must propose an alternative timeline or construction sequence. Notification shall not constitute approval. Any alternative timeline approved by City staff shall become an enforceable component of this permit.

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12. The permittee shall at all times provide the operation and maintenance necessary to assure the permitted stormwater system functions at optimum efficiency. The approved Operation and Maintenance Agreement must be followed in its entirety and maintenance must occur at the scheduled intervals including, but not limited to:
    a. Scheduled inspections (interval noted on the agreement).
    b. Sediment removal.
    c. Mowing and revegetation of slopes and the vegetated areas.
    d. Maintenance of landscape plants, including those within the landscape buffer and on the vegetated shelf.
    e. Immediate repair of eroded areas, especially slopes.
    f. Debris removal and unclogging of outlet structure, orifice device, flow spreader, catch basins and/or piping.
    g. Access to the outlet structure must be available at all times.

13. Records of inspection, maintenance and repair for the permitted stormwater system must be kept by the permittee for at least 5 years from the date of record and made available upon request to authorized personnel of the City of Wilmington. The records will indicate the date, activity, name of person performing the work and what actions were taken.

14. Upon completion of construction, before a Certificate of Occupancy shall be granted, and prior to operation or intended use of this permitted facility, the applicant shall submit to the City of Wilmington as-built plans for all stormwater management facilities. The plans shall show the final design specifications and the field location, type, depth, invert and planted vegetation of all measures, controls and devices, as-installed. A certification shall be submitted, along with all supporting documentation that specifies, under seal that the as-built stormwater measures, controls and devices are in compliance with the approved stormwater management plans. A final inspection by City of Wilmington personnel will be required prior to issuance of a certificate of occupancy or operation of the permitted facility.

15. This permit is not transferable except after application and approval by the City of Wilmington. In the event of a change of ownership, name change or change of address the permittee must submit a completed Name/Ownership Change form to the City of Wilmington at least 30 days prior to the change. It shall be signed by all applicable parties, and be accompanied by all required supporting documentation. Submittal of a complete application shall not be construed as an approved application. The application will be reviewed on its own merits by the City of Wilmington and may or may not be approved. The project must be in compliance with the terms of this permit in order for the transfer request to be considered. The permittee is responsible for compliance with all permit conditions until such time as the City of Wilmington approves the transfer request. Neither the sale of the project nor the conveyance of common area to a third party should be considered as an approved transfer of the permit.

16. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to enforcement action by the City of Wilmington, in accordance with Sections 18-52 and 18-53 and any other applicable section of the Land Development Code.

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17. The City of Wilmington may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the City of Wilmington for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the City of Wilmington that the changes have been made.

18. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) having jurisdiction.

19. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by the City of Wilmington, such as the construction of additional or replacement stormwater management systems.

20. The permittee grants City of Wilmington Staff permission to enter the property during normal business hours for the purpose of inspecting all components of the permitted stormwater management facility.

21. The permit issued shall continue in force and effect until revoked or terminated by the City of Wilmington. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and re-issuance or termination does not stay any permit condition.

22. The approved stormwater management plans and all documentation submitted as part of the approved stormwater management permit application package for this project are incorporated by reference and are enforceable parts of the permit.

23. The permittee shall submit a renewal request with all required forms and documentation at least 180 days prior to the expiration date of this permit.

24. If any one or more of the conditions of this permit is found to be unenforceable or otherwise invalidated, all remaining conditions shall remain in full effect.

Stormwater Management Permit issued this the 27th day of June, 2019.

for Sterling Cheatham, City Manager
City of Wilmington

CITY OF WILMINGTON
NORTH CAROLINA

*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.):

   Woodlands Landing at Echo Farms

2. Location of Project (street address):

   4114 Echo Farms Boulevard

   City: Wilmington County: New Hanover Zip: 28412

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

   Located 0.80 miles south of the intersection of Hwy. 421 (Carolina Beach Road) and Independence Boulevard (S.R. 1209). Project site is on the SE side of Independence Boulevard.

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:

   _____

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: GHK Cape Fear Development, LLC

   Signing Official & Title: William W. Schoettelkotte - Manager

   a. Contact information for Applicant / Signing Official:

   Street Address: 1051 Military Cutoff Road STE 200

   City: Wilmington State: NC Zip: 28405

   Phone: 910-344-1000 Fax: _____ Email: bill@capefearcommercial.com

   Mailing Address (if different than physical address): same

   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: Echo Farms, LLC C/O Matrix Development Group

   Signing Official & Title: Joseph S. Taylor - Manager

   a. Contact information for Property Owner:

   Street Address: 3 CENTRE DRIVE

   City: MONROE TWP. State: NJ Zip: 08831

   Phone: 732-521-2900 Fax: _____ Email: bstapleton@matrixcompanies.com

   Mailing Address (if different than physical address): CN 4000 FORSGATE DRIVE

   City: CRANBURY State: NJ Zip: 08512

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: JOSEPH S. TAYLOR, MANAGER

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 storm water runoff to the wet detention ponds with forebays.
2. Total Property Area: 807,945 square feet
3. Total Coastal Wetlands Area: 0 square feet
4. Total Surface Water Area: 36,441 square feet
5. Total Property Area (2) – Total Coastal Wetlands Area (3) – Total Surface Water Area (4) = Total Project Area: 771,504 square feet.
6. Existing Impervious Surface within Property Area: 20,860 square feet
7. Existing Impervious Surface to be Removed/Demolished: 20,860 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	111,100
Impervious Pavement	150,000
Pervious Pavement (adj. total, with % credit applied)	0
Impervious Sidewalks	56,064
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe)	0
Future Development	63,081
Total Onsite Newly Constructed Impervious Surface	380,245

10. Total Onsite Impervious Surface
    (Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 380,245 square feet
11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 49 %

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

Impervious Pavement	2,357
Pervious Pavement (adj. total, with % credit applied)	0
Impervious Sidewalks	1,056
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe)	0
Total Offsite Newly Constructed Impervious Surface	3,413

13. Total Newly Constructed Impervious Surface
(Total Onsite + Offsite Newly Constructed Impervious Surface) = 383658 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 Pond BMP # 3A-1	Wet Pond BMP # 3A-2	Wet Pond BMP # 3A-3
Receiving Stream Name	Barnards Creek	Barnards Creek	Barnards Creek
Receiving Stream Index Number	18-80	18-80	18-80
Stream Classification	C;Sw	C;Sw	C;Sw
Total Drainage Area (sf)	256133	268950	589732
On-Site Drainage Area (sf)	256133	265947	157543
Off-Site Drainage Area (sf)	0	3003	432189
Total Impervious Area (sf)	151800	167590	268938
Buildings/Lots (sf)	48200	51060	14740
Impervious Pavement (sf)	82700	92530	35270
Pervious Pavement, % credit (sf)	0	0	0
Impervious Sidewalks (sf)	17764	24000	8545
Pervious Sidewalks, % credit (sf)	0	0	0
Other (sf)	0	0	37733
Future Development (sf)	3136	0	20000
Existing Impervious to remain (sf)	0	0	0
Offsite (sf)	0	0	152650
Percent Impervious Area (%)	59.3%	62.4%	45.6%

15. How was the off-site impervious area listed above determined? Provide documentation:
Off-site impervious area is from Tract 3B and the proposed multi-use path constructed in NHC Parks' property surrounding Tract 3A and draining to Pond 3A-3 (previously titled Pond 3.1-B).

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: Branch Smith, 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: bsmith@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*) Joseph S. Taylor, 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*) William W. Schoettelkotte with (*print or type name of organization listed in Contact Information, item 1*) GHK Cape Fear Development, LLC 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: 11.6.2018

SEAL

I, Lisa Balasic, a Notary Public for the State of NEW JERSEY, County of MERCER, do hereby certify that JOSEPH S. TAYLOR personally appeared before me this day of NOVEMBER 6, 2018, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

Lisa Balasic

My commission expires: _____

LISA BALASIC
NOTARY PUBLIC OF NEW JERSEY
ID# 2115642
MY COMMISION EXPIRES SEPT. 15, 2023

CITY OF WILMINGTON ENGINEERING

VIII. APPLICANT'S CERTIFICATION

I, *(print or type name of person listed in Contact Information, item 1)* , William W. Schoettelkotte 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: _____ Date: 4/22/19

SEAL

PENNY S. MILLIS
NOTARY PUBLIC
PENDER COUNTY, NC

I, Penny S. Millis, a Notary Public for the State of North Carolina, County of Pender, do hereby certify that William W. Schoettelkotte personally appeared before me this 22, April day of 2019, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

_____

My commission expires: 10/19/22

SUPPLEMENT-EZ FORM COVER PAGE

Please indicate the types, quantities and locations of SCMs that will be used on this project:

	Quantity	Location(s)
Infiltration System		
Bioretention Cell		
Wet Pond	3	3A-1, 3A-2, & 3A-3 on Tract 3A
Stormwater Wetland		
Permeable Pavement		
Sand Filter		
Rainwater Harvesting		
Green Roof		
Level Spreader-Filter Strip		
Disconnected Impervious Surface		
Treatment Swale		
Dry Pond		

Project Name:

Woodlands Landing at Echo Farms

Address

4114 Echo Farms Blvd, Wilmington, NC

City / Town

Wilmington

Designer information for this project:

Name and Title:	J. Branch Smith, PE
Organization:	Paramounte Engineering, Inc.
Street address:	122 Cinema Drive
City, State, Zip:	Wilmington, NC 28403
Phone number(s):	910-791-6707
Email:	bsmith@paramounte-eng.com

Applicant:

Company:	Echo Farms LLC. c/o Matrix Development Group
Contact:	B. Stapleton
Mailing Address:	CN 400 Forsgate Drive
City, State, Zip:	Cranbury, NJ 08512
Phone number(s):	732-521-2900
Email:	bstapleton@matrixcompanies.com

Designer

NORTH CAROLINA PROFESSIONAL SEAL 034354 ENGINEER JAMES BRANCH SMITH

Seal

Signature of Designer

3/29/2019

Date

Certification Statement:

I certify, under penalty of law: that this Supplement-EZ form and all supporting information were prepared under my direction or supervision;

- that the information provided in the form is, to the best of my knowledge and belief, true, accurate, and complete; and

- that the engineering plans, specifications, operation and maintenance agreements and other supporting information are consistent with the information provided here.

I am aware that there are significant penalties for submitting false information including the possibility of fines and imprisonment for knowing violations as well as a report being made to my professional board.

RECEIVED APR - 1 2019 ENGINEERING

WET POND

Woodlands Landing at Echo Farms

THE DRAINAGE AREA

Drainage area number	3A-1	**Break down of BUA in the drainage area (both new and existing):**	
Total coastal wetlands area (sq ft)	sf	- Parking / driveway (sq ft)	59,100
Total surface water area (sq ft)	sf	- Sidewalk (sq ft)	16,700
Total drainage area (sq ft)	256,133	- Roof (sq ft)	48,200
BUA associated with existing development (sq ft)	sf	- Roadway (sq ft)	23,600
Proposed new BUA (sq ft)	151,800	- Other, please specify in the comment box below (sq ft)	4,200
Percent BUA of drainage area	59.3%	**Total BUA (sq ft)**	151,800

COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM

Stormwater program(s) that apply (please specify):	Design rainfall depth (in)	1.5 in
MDC [15A NCAC 02H.1053] - North Carolina coastal stormwater rules	Minimum volume required (cu ft)	18,655
	Design volume of SCM (cu ft)	21,155

GENERAL MDC FROM 02H .1050

#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the mainetenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?	(3:1)	#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a singfe family lot, does the plat comply with General MDC (10)?	No
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	Yes

WET POND MDC FROM 02H .1053

#1 Method used	SA/DA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	15,096	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	42,025	#6 Elevation of top of shelf (fmsl)	12 ft
#2 Average depth of the main pool (feet)	3.8 ft	#6 Elevation of bottom of shelf (fmsl)	11 ft
#2 Was the vegetated shelf included in the calculation of average depth?	No	#6 Slope of vegetated shelf (H:V)	(6:1)
#2 Elevation of the bottom of the permanent pool (fmsl)	6.0 ft	#7 Diameter of drawdown orifice (inches)	2.0 in
#2 Elevation of the top of the permanent pool (fmsl)	12.0 ft	#7 Drawdown time for the temporary pool (hours)	101 hrs
#2 Elevation of the top of the temporary pool (fmsl)	13.0 ft	#7 Does the orifice drawdown from below the top surface of the permanent pool?	Yes
#3 Depth provided for sediment storage (inches)	12 in	#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	Yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	Yes	#9 Are fountains proposed?	No
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	No
		#10 Is a trash rack or other device provided to protect the outlet system?	Yes
#5 Volume of the forebay (cubic feet)	7917	#11 Are the dam and embankment planted in non-clumping turf grass?	No
#5 Is this 15-20% of the volume in the main pool?	Yes	#11 Species of turf that will be used on the dam and embankment	see below
#5 Depth of forebay at entrance (inches)	60 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	48 in	Bermuda Sod. Contractor to install a minimum of 3 species on the sloped shelf in a 6' x33' area (200sf) based on plant material and water depths. Suitable plants (plugs) will follow the pond details on the drawings.	
#5 Does water flow out of the forebay in a non-erosive manner?	Yes		
#5 Clean-out depth for forebay (inches)	48 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	Yes		

ADDITIONAL INFORMATION

Please use this space to provide any additional information about this wet pond that you think is relevant to the review:

WET POND

Woodlands Landing at Echo Farms

THE DRAINAGE AREA				2
Drainage area number	3A-2	**Break down of BUA in the drainage area (both new and existing):**		
Total coastal wetlands area (sq ft)	sf	- Parking / driveway (sq ft)		71,430
Total surface water area (sq ft)	sf	- Sidewalk (sq ft)		24,000
Total drainage area (sq ft)	268,950	- Roof (sq ft)		51,060
BUA associated with existing development (sq ft)	sf	- Roadway (sq ft)		21,100
Proposed new BUA (sq ft)	167,590	- Other, please specify in the comment box below (sq ft)		-
Percent BUA of drainage area	62.3%	**Total BUA (sq ft)**		167,590

COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM			
Stormwater program(s) that apply (please specify):		Design rainfall depth (in)	1.5 in
MDC [15A NCAC 02H.1053] - North Carolina coastal stormwater rules		Minimum volume required (cu ft)	20,864
		Design volume of SCM (cu ft)	23,222

GENERAL MDC FROM 02H .1050			
#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the mainetenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?	(3:1)	#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	No
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	Yes

WET POND MDC FROM 02H .1053			
#1 Method used	SA/DA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	13,069	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	41,301	#6 Elevation of top of shelf (fmsl)	11 ft
#2 Average depth of the main pool (feet)	3.9 ft	#6 Elevation of bottom of shelf (fmsl)	10 ft
#2 Was the vegetated shelf included in the calculation of average depth?	No	#6 Slope of vegetated shelf (H:V)	(6:1)
#2 Elevation of the bottom of the permanent pool (fmsl)	6.0 ft	#7 Diameter of drawdown orifice (inches)	2.5 in
#2 Elevation of the top of the permanent pool (fmsl)	11.0 ft	#7 Drawdown time for the temporary pool (hours)	64 hrs
#2 Elevation of the top of the temporary pool (fmsl)	12.25 ft	#7 Does the orifice drawdown from below the top surface of the permanent pool?	Yes
#3 Depth provided for sediment storage (inches)	12 in	#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	Yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	Yes	#9 Are fountains proposed?	No
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	No
		#10 Is a trash rack or other device provided to protect the outlet system?	Yes
#5 Volume of the forebay (cubic feet)	7816	#11 Are the dam and embankment planted in non-clumping turf grass?	No
#5 Is this 15-20% of the volume in the main pool?	Yes	#11 Species of turf that will be used on the dam and embankment	see below
#5 Depth of forebay at entrance (inches)	48 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	36 in	Bermuda Sod. Contractor to install a minimum of 3 species on the sloped shelf in a 6' x33' area (200sf) based on plant material and water depths. Suitable plants (plugs) will follow the pond details on the drawings.	
#5 Does water flow out of the forebay in a non-erosive manner?	Yes		
#5 Clean-out depth for forebay (inches)	36 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	Yes		

ADDITIONAL INFORMATION

Please use this space to provide any additional information about this wet pond that you think is relevant to the review:

- "Other" for breakdown of BUA is offsite sidewalk and roadway to be constructed for Tract 3A and draining to Pond 3A-2

WET POND

Woodlands Landing at Echo Farms

3

THE DRAINAGE AREA			
Drainage area number	3A-3	**Break down of BUA in the drainage area (both new and existing):**	
Total coastal wetlands area (sq ft)	sf	- Parking / Driveway / Roadway (sq ft)	35,270
Total surface water area (sq ft)	sf	- Sidewalk (sq ft)	8,545
Total drainage area (sq ft)	589,732	- Roof (sq ft)	14,740
BUA associated with existing development (sq ft)	sf	- Future (sq ft)	20,000
Proposed new BUA (sq ft)	268,938	- Other, please specify in the comment box below (sq ft)	190,383
Percent BUA of drainage area	45.6%	**Total BUA (sq ft)**	268,938

COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM		
Stormwater program(s) that apply (please specify):	Design rainfall depth (in)	1.5 in
2017 Coastal SW Rules	Minimum volume required (cu ft)	33,437
	Design volume of SCM (cu ft)	40,461

GENERAL MDC FROM 02H .1050			
#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the mainetenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?	3:1, 6:1, 2:1	#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	No
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	Yes

WET POND MDC FROM 02H .1053			
#1 Method used	SA/DA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	13,944	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	53,483	#6 Elevation of top of shelf (fmsl)	10 ft
#2 Average depth of the main pool (feet)	5.1 ft	#6 Elevation of bottom of shelf (fmsl)	9 ft
#2 Was the vegetated shelf included in the calculation of average depth?	No	#6 Slope of vegetated shelf (H:V)	(6:1)
#2 Elevation of the bottom of the permanent pool (fmsl) - SEDIMENT REMOVAL ELEV.	3.0 ft	#7 Diameter of drawdown orifice (inches)	3.0 in
#2 Elevation of the top of the permanent pool (fmsl)	10.0 ft	#7 Drawdown time for the temporary pool (hours)	55 hrs
#2 Elevation of the top of the temporary pool (fmsl)	12.00 ft	#7 Does the orifice drawdown from below the top surface of the permanent pool?	Yes
#3 Depth provided for sediment storage (inches)	12 in	#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	Yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	Yes	#9 Are fountains proposed?	No
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	No
N/A		#10 Is a trash rack or other device provided to protect the outlet system?	Yes
#5 Volume of the forebay (cubic feet)	8386	#11 Are the dam and embankment planted in non-clumping turf grass?	Yes
#5 Is this 15-20% of the volume in the main pool?	Yes	#11 Species of turf that will be used on the dam and embankment	Bermuda
#5 Depth of forebay at entrance (inches)	60 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	48.00 in	Bermuda Sod. Contractor to install a minimum of 3 species on the sloped shelf in a 6' x33' area (200sf) based on plant material and water depths. Suitable plants (plugs) will follow the pond details on the drawings.	
#5 Does water flow out of the forebay in a non-erosive manner?	Yes		
#5 Clean-out depth for forebay (inches)	48 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	Yes		

ADDITIONAL INFORMATION

Please use this space to provide any additional information about this wet pond that you think is relevant to the review:

- "Other" listed in BUA above is impervious that is in Tract 3B of Echo Farms and the proposed multi-use path in the NHC Parks property surrounding the Tract 3A property. This BUA will drain to Pond 3A-3 in Tract 3A of Echo Farms.

Operation & Maintenance Agreement

Project Name:	**Woodlands Landing at Echo Farms**
Project Location:	**4114 Echo Farms Boulevard**

Cover Page

Maintenance records shall be kept on the following BMP(s). This maintenance record shall 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 pollutant removal efficiency of the BMP(s).

The BMP(s) on this project include (check all that apply & corresponding O&M tables will be added automatically):

Bioretention Cell	Quantity:		Location(s):	
Dry Detention Basin	Quantity:		Location(s):	
Grassed Swale	Quantity:		Location(s):	
Green Roof	Quantity:		Location(s):	
Infiltration Basin	Quantity:		Location(s):	
Infiltration Trench	Quantity:		Location(s):	
Level Spreader/VFS	Quantity:		Location(s):	
Permeable Pavement	Quantity:		Location(s):	
Proprietary System	Quantity:		Location(s):	
Rainwater Harvesting	Quantity:		Location(s):	
Sand Filter	Quantity:		Location(s):	
Stormwater Wetland	Quantity:		Location(s):	
Wet Detention Basin	Quantity:	3	Location(s):	
Disconnected Impervious Area	Present:	No	Location(s):	
User Defined BMP	Present:	No	Location(s):	

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed for each BMP above, and attached O&M tables. I agree to notify NCDENR of any problems with the system or prior to any changes to the system or responsible party.

* Responsible Party:	**Woodlands Landing, LLC**
Title & Organization:	**William W. Schoettelkotte - Manager**
Street address:	**1051 Military Cutoff Road, Suite 200**
City, state, zip:	**Wilington, NC 28405**
Phone number(s):	**910-344-1000**
Email:	**bill@capefearcommercial.com**

Signature: _____ Date: 4/22/19

I, Penny S. Millis, a Notary Public for the State of North Carolina

County of Pender, do hearby certify that William W. Schoettel Kotte

personally appeared before me this 22 day of April, 2019 and

acknowledge the due execution of the Operations and Maintenance Agreement .

Witness my hand and official seal, _____.

My Commission expires 10/19/22

PENNY S. MILLIS NOTARY PUBLIC PENDER COUNTY, NC

RECEIVED APR 24 2019 ENGINEERING

Wet Detention Pond Maintenance Requirements

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

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 1.0 inches (or 1.5 inches if in a Coastal County)**. 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 perimeter of the BMP	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.
The inlet device	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.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and replace with clean stone.
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
	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.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.

Wet Detention Pond Maintenance Requirements (Continued)

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.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).
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 Department of Environment and Natural Resources Regional Office.
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.		

Wet Detention Pond Design Summary

Wet Pond Diagram

WET POND ID	FOREBAY		MAIN POND	
3A-1	Permanent Pool El.	12	Permanent Pool El.	12
	Temporary Pool El:	13	Temporary Pool El:	13
Pretreatment other than forebay? No	Clean Out Depth:	4	Clean Out Depth:	6
	Sediment Removal El:	8	Sediment Removal El:	6
Has Veg. Filter? No	Bottom Elevation:	7	Bottom Elevation:	5
WET POND ID	**FOREBAY**		**MAIN POND**	
3A-2	Permanent Pool El.	11	Permanent Pool El.	11
	Temporary Pool El:	12.25	Temporary Pool El:	12.25
Pretreatment other than forebay? No	Clean Out Depth:	3	Clean Out Depth:	5
	Sediment Removal El:	8	Sediment Removal El:	6
Has Veg. Filter? No	Bottom Elevation:	7	Bottom Elevation:	5
WET POND ID	**FOREBAY**		**MAIN POND**	
3A-3	Permanent Pool El.	10	Permanent Pool El.	10
	Temporary Pool El:	12	Temporary Pool El:	12
Pretreatment other than forebay? No	Clean Out Depth:	4	Clean Out Depth:	7
	Sediment Removal El:	6	Sediment Removal El:	3
Has Veg. Filter? No	Bottom Elevation:	5	Bottom Elevation:	2