



**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: **The Offices at Airlie, LLC**  
PROJECT: **The Offices at Airlie**  
ADDRESS: **1613 Military Cutoff Rd.**  
PERMIT #: **2015026**  
DATE: **September 10, 2015**

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 September 10, 2025 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 9/3/2015.
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.
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.



**Public Services**

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

- 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.
  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



**Public Services**

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

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 Engineering 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.
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.



**Public Services**

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

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 10<sup>th</sup> day of September, 2015

A handwritten signature in black ink, appearing to read "Rolf Y. Cheatham".

---

for Sterling Cheatham, City Manager  
City of Wilmington



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

**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.):

Airlie Offices

2. Location of Project (street address):

1613 Military Cutoff Road

City: Wilmington County: New Hanover Zip: 28405

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

Site is located at the northeast corner of the intersection of SR 1409 (Military cutoff Road) and SR 2782 (Wrightsville Avenue).

**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):

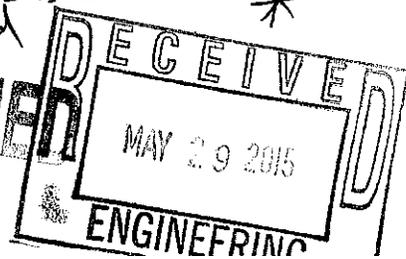
CAMA Major  Sedimentation/Erosion Control

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:

*Unless otherwise noted*

**SCANNED**



**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: The Offices at Airlie, LLC

Signing Official & Title: John S. Anderson, Member Manager

- a. Contact information for Applicant / Signing Official:

Street Address: 10 S. Cardinal Drive

City: wilmington State: NC Zip: 28403

Phone: 616-0483 Fax: \_\_\_\_\_ Email: sa@ec.rr.com

Mailing Address (if different than physical address): \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

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

The property owner (Skip to item 3)

Lessee\* (Attach a copy of the lease agreement and complete items 2 and 2a below)

Purchaser\* (Attach a copy of the pending sales agreement and complete items 2 and 2a below)

Developer\* (Complete items 2 and 2a below.)

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

Property Owner / Organization: Vernell Green

Signing Official & Title: Owner

- a. Contact information for Property Owner:

Street Address: 55 Hyde Park Drive #344

City: Inselin State: NY Zip: 08830

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

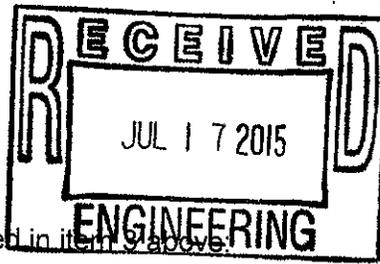
Mailing Address (if different than physical address): \_\_\_\_\_

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 9 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.

Pervious concrete pavement including curbing and concrete sidewalk to be treated through pervious pavement. Roof runoff to be treated through infiltration basin.

2. Total Property Area: 78,683 square feet

3. Total Coastal Wetlands Area: 0 square feet

4. Total Surface Water Area: 0 square feet

5. Total Property Area (2) – Total Coastal Wetlands Area (3) – Total Surface Water Area (4) = Total Project Area: 78,683 square feet.

6. Existing Impervious Surface within Property Area: 1,562 square feet

7. Existing Impervious Surface to be Removed/Demolished: 1,562 square feet

8. Existing Impervious Surface to Remain: 0 square feet

9. Total Onsite (within property boundary) Newly Constructed Impervious Surface (*in square feet*):

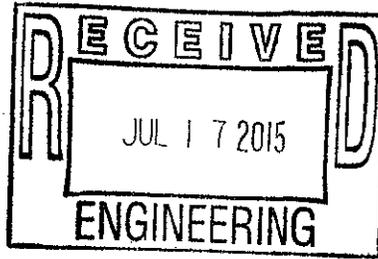
Buildings/Lots	10,000
Impervious Pavement	0
Pervious Pavement (adj. total, with 75 % credit applied)	7,201
Impervious Sidewalks	2,455
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe) curb & gutter	2,760
Future Development	0
<b>Total Onsite Newly Constructed Impervious Surface</b>	<b>22,416</b>

10. Total Onsite Impervious Surface

(Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 24,416 square feet

11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 28.5 %

**SCANNED**



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

Impervious Pavement	1,325
Pervious Pavement (adj. total, with % credit applied)	0
Impervious Sidewalks	4,880
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe) curb & gutter	180
<b>Total Offsite Newly Constructed Impervious Surface</b>	<b>6,285</b>

13. Total Newly Constructed Impervious Surface

(Total Onsite + Offsite Newly Constructed Impervious Surface) = 28,701 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 #
Receiving Stream Name	UT Bradley Creek	UT Bradley Creek	
Receiving Stream Index Number	18-87-24-4-(1)	18-87-24-4-(1)	
Stream Classification	SC; HQW:#	SC; HQW:#	
Total Drainage Area (sf)	64,850	13,833	
On-Site Drainage Area (sf)	64,850	13,833	
Off-Site Drainage Area (sf)	0	0	
<b>Total Impervious Area (sf)</b>	<b>21,159</b>	<b>10,000</b>	
Buildings/Lots (sf)	0	10,000	
Impervious Pavement (sf)	0	0	
Pervious Pavement (sf)	7,201	0	
Impervious Sidewalks (sf)	2,455	0	
Pervious Sidewalks (sf)	0	0	
Other (sf) curb & gutter	2,760	0	
Future Development (sf)	0	0	
Existing Impervious to remain (sf)	0	0	
Offsite (sf)	0	0	
Percent Impervious Area (%)	34.6	72.3	

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

N/A

---

## 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: Phillip G. Tripp, P.E.

Consulting Firm: Tripp Engineering

- a. Contact information for consultant listed above:

Mailing Address: 419 Chestnut Street

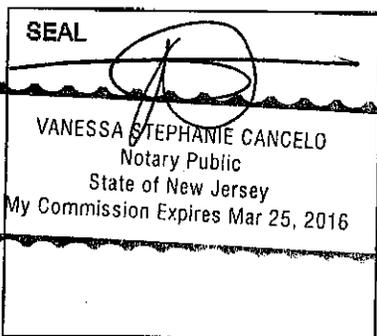
City: Wilmington State: NC Zip: 28401

Phone: 910-763-6100 Fax: 910-763-5631 Email: trippeng@ec.rr.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) vernell Green, 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) John S. Anderson with (print or type name of organization listed in Contact Information, item 1) The Offices at Airlie, 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: [Handwritten Signature]  
Date: 5/19/15

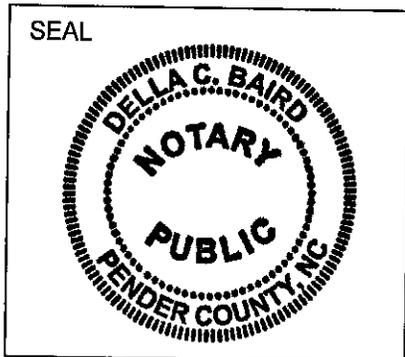
I, Vanessa Cancelo, a Notary Public for the State of NS, County of Middlesex, do hereby certify that Vernell Green personally appeared before me this day of May 19, 2015.

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) John S. Anderson 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: *J S Anderson*

Date: 5/19/15

I, Della C. Baird, a Notary Public for the State of North Carolina, County of Pender, do hereby certify that John S. Anderson personally appeared before me this 19 day of May, 2015, and acknowledge the due execution of the application for a stormwater

permit. Witness my hand and official seal,

*Della C. Baird*

My commission expires: 10-15-16



STORMWATER MANAGEMENT PERMIT APPLICATION FORM  
 401 CERTIFICATION APPLICATION FORM  
**PERMEABLE PAVEMENT SUPPLEMENT**



*This form must be completely 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: Airfile Offices  
 Contact Person: Phillip G. Tripp, PE  
 Phone Number: 910-763-5100  
 Date: 7/16/2015  
 Drainage Area: 1

**II. DESIGN INFORMATION**

**Soils Report Summary**

Hydrologic soil group (HSG) of subgrade: B  
 Infiltration rate: 2.50 in/hr

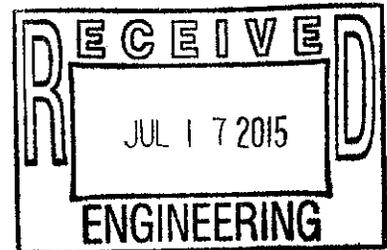
**Pavement Design Summary**

Permeable Pavement (PP) design type: Infiltration - HSG A/B

SA of PP being proposed (A <sub>p</sub> )	28,805	ft <sup>2</sup>	
Resulting BUA counted as impervious for main application form	7,201	ft <sup>2</sup>	
Adjacent BUA directed to PP (A <sub>c</sub> )	5,215	ft <sup>2</sup>	OK
Ratio of A <sub>c</sub> to A <sub>p</sub>	0.18	(unitless)	
Flow from pervious surfaces is directed away from PP?	Yes		OK
Design rainfall depth	1.5"	in	
Permeable pavement surface course type	PC		
Layer 1 - Washed aggregate size (ex. No. 57)	No. 57		
Layer 1 - Aggregate porosity (n)	0.40	(unitless)	OK
Layer 2 - Washed aggregate size (ex. No. 57)	-		
Layer 2 - Aggregate porosity (n)	-	(unitless)	Please verify; Must be between 0 & 1
Minimum total aggregate depth for design rainfall (D <sub>wq</sub> )	4.4	in	
Drawdown/infiltration time for D <sub>wq</sub>	0.1	days	OK
How is 10-yr, 24-hr storm handled?	infiltrated		
Aggregate depth to infiltrate 10-yr, 24-hr storm (D <sub>10</sub> )	9.3	in	
Drawdown/infiltration time of 10-yr, 24-hr storm	0.69	days	
Actual provided total aggregate depth	9.0	in	OK
Top of aggregate base layer elevation	26.0-26.5	fmsl	
Storage elevation of design rainfall depth	25.625-26.125	fmsl	
Overflow elevation	26.50	fmsl	
Bottom elevation at subgrade	25.25-25.75	fmsl	
SHWT elevation	23.50	fmsl	
Underdrain diameter	-	in	

BUA Credit for Permeable Pavement Footprint:  
**75% BUA Credit**

#REF!

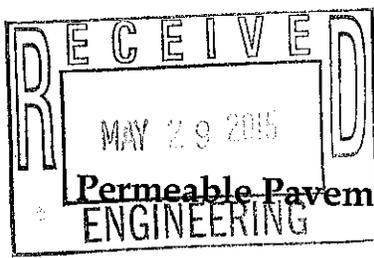


**Detention Systems** (skip for infiltration systems)

Diameter of orifice	_____	in
Coefficient of discharge ( $C_D$ )	_____	(unitless)
Driving head ( $H_o$ )	_____	ft
Storage volume discharge rate (through discharge orifice)	_____	ft <sup>3</sup> /sec
Storage volume drawdown time	_____	days
Pre-development 1-yr, 24-hr peak flow	_____	ft <sup>3</sup> /sec
Post-development 1-yr, 24-hr peak flow	_____	ft <sup>3</sup> /sec

**Additional Information**

Slope of soil subgrade at bottom of permeable pavement	0.00	%	OK
Slope of the permeable pavement surface	0.00	%	OK
Construction sequence minimizes compaction to soils?	Yes		OK
Subsoil preparation specified (must select one)	scarified		
Meets industry standards for structural requirements?	Yes		OK
Washed stone is specified for the aggregate?	Yes		OK
Required signage specified on plans?	Yes		OK
Number of observation wells provided	4		OK
Distance to structure	40.00	ft	
Distance to surface waters	30+	ft	OK
Distance to water supply well(s)	100+	ft	OK



Permit Number: \_\_\_\_\_  
 (to be provided by City of Wilmington)  
 Drainage Area / Lot Number: \_\_\_\_\_

**Permeable Pavement Operation and Maintenance Agreement**

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

**Important operation and maintenance procedures:**

- Stable groundcover will be maintained in the drainage area to reduce the sediment load to the permeable pavement.
- The area around the perimeter of the permeable pavement will be stabilized and mowed, with clippings removed.
- Any weeds that grow in the permeable pavement will be sprayed with pesticide immediately. Weeds will not be pulled, since this could damage the fill media.
- Once a year, the permeable pavement surface will be vacuum swept.
- At no time shall wet sweeping (moistening followed by sweeping) be allowed as a means of maintenance.
- There shall be no repair or treatment of Permeable Pavement surfaces with other types of pavement surfaces. All repairs to Permeable Pavement surfaces must be accomplished utilizing permeable pavement which meets the original pavement specifications.
- Concentrated runoff from roof drains, piping, swales or other point sources, directly onto the permeable pavement surface shall not be allowed. These areas must be diverted away from the permeable pavement.

**Initial Inspection:** Permeable Pavements shall be inspected monthly for the first three months for the following:

<b>BMP element:</b>	<b>Potential problem:</b>	<b>How to remediate the problem:</b>
<b>The perimeter of the permeable pavement</b>	Areas of bare soil and/or erosive gullies have formed.	In the event that rutting or failure of the groundcover occurs, the eroded area shall be repaired immediately and permanent groundcover re-established. Appropriate temporary Erosion Control measures (such as silt fence) shall be installed in the affected area during the establishment of permanent groundcover, and any impacted area of permeable pavement is to be cleaned via vacuum sweeping.
<b>The surface of the permeable pavement</b>	Rutting / uneven settlement	This indicates inadequate compaction of the pavement base / sub-base. If rutting or uneven settlement on the order of 1/2 inch or greater occurs, permeable pavement shall be removed and base / sub-base re-compacted, smoothed, and permeable pavement shall then be re-installed. Base and sub-base compaction shall be monitored by a licensed geotechnical engineer to ensure that infiltration capacity of base and sub-base are not compromised by compaction and smoothing processes.
	The pavement does not dewater between storms, or water is running off.	Vacuum sweep the pavement. If the pavement still does not dewater, consult a professional.

Permit Number: \_\_\_\_\_  
 (to be provided by City of Wilmington)  
 Drainage Area / Lot Number: \_\_\_\_\_

The permeable pavement will be inspected **once a quarter and within 24 hours after every storm event greater than 1.5 inches**. Records of operation and maintenance will be kept in a known set location and will be available upon request.

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

<b>BMP element:</b>	<b>Potential problem:</b>	<b>How to remediate the problem:</b>
<b>The perimeter of the permeable pavement</b>	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 3 to 6 inches (remove clippings).
<b>The surface of the permeable pavement</b>	Trash/debris is present.	Remove the trash/debris.
	Weeds are growing on the surface of the permeable pavement.	Do not pull the weeds (may pull out media as well). Spray them with pesticide.
	Sediment is present on the surface.	Vacuum sweep the pavement.
	The structure is deteriorating or damaged.	Consult an appropriate professional. Damaged areas of the pavement shall be removed and repaired.
	The pavement does not dewater between storms.	Vacuum sweep the pavement. If the pavement still does not dewater, consult a professional. Permanently clogged pavement shall be removed and repaired.

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 City of Wilmington of any problems with the system or prior to any changes to the system or responsible party.

Project name: Airlie Offices

BMP drainage area or lot number: 1

Print name: John S. Anderson

Title: Member Manager

Address: 10 S. Cardinal Drive, Wilmington, NC 28403

Phone: 910-616-0483

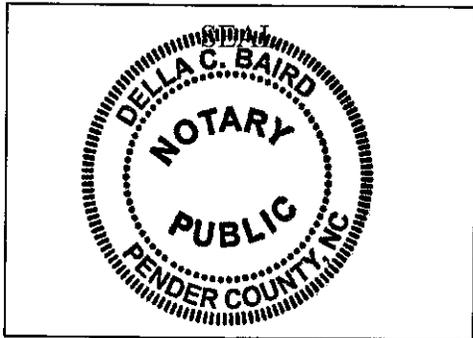
Signature: *John S. Anderson*

Date: 5/19/15

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, Della C Baird, a Notary Public for the State of North Carolina, County of Pender, do hereby certify that John S. Anderson personally appeared before me this 19 day of May, 2015, and acknowledge the due execution of the forgoing permeable pavement maintenance requirements. Witness my hand and official seal,

*Della C. Baird*



My commission expires 10-15-16

STORMWATER MANAGEMENT PERMIT APPLICATION FORM  
401 CERTIFICATION APPLICATION FORM  
**INFILTRATION 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	Airline Offices
Contact Person	Phillip G. Tripp, PE
Phone Number	910-763-5100
Date	5/19/2015
Drainage Area Number	2

II. DESIGN INFORMATION	
------------------------	--

**Site Characteristics**

Drainage area	13,833.00	ft <sup>2</sup>
Impervious area	10,000.00	ft <sup>2</sup>
Percent impervious	0.72	%
Design rainfall depth	1.50	in

**Peak Flow Calculations**

1-yr, 24-hr rainfall depth		in
1-yr, 24-hr intensity		in/hr
Pre-development 1-yr, 24-hr discharge		ft <sup>3</sup> /sec
Post-development 1-yr, 24-hr discharge		ft <sup>3</sup> /sec
Pre/Post 1-yr, 24-hr peak flow control		ft <sup>3</sup> /sec

**Storage Volume: Non-SA Waters**

Minimum design volume required	1,212.00	ft <sup>3</sup>
Design volume provided	3,072.00	ft <sup>3</sup>

OK for non-SA waters

**Storage Volume: SA Waters**

1.5" runoff volume		ft <sup>3</sup>
Pre-development 1-yr, 24-hr runoff volume		ft <sup>3</sup>
Post-development 1-yr, 24-hr runoff volume		ft <sup>3</sup>
Minimum required volume		ft <sup>3</sup>
Volume provided		ft <sup>3</sup>

**Soils Report Summary**

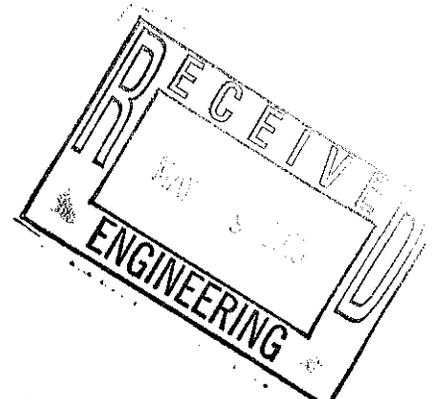
Soil type	sand	
Infiltration rate	2.50	in/hr
SHWT elevation	23.50	fmsl

**Basin Design Parameters**

Drawdown time	0.09	days	OK
Basin side slopes	3.00	:1	OK
Basin bottom elevation	25.50	fmsl	OK
Storage elevation	26.50	fmsl	
Storage Surface Area	3,313.00	ft <sup>2</sup>	
Top elevation	27.50	fmsl	

**Basin Bottom Dimensions**

Basin length	73.90	ft
Basin width	38.00	ft
Bottom Surface Area	2,831.00	ft <sup>2</sup>



**Additional Information**

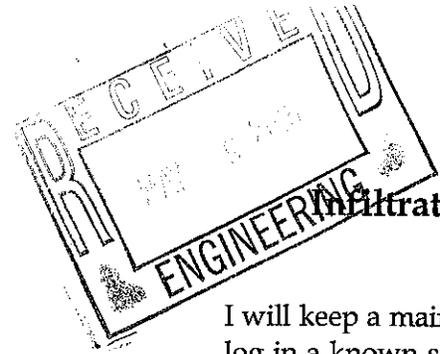
Maximum runoff to each inlet to the basin?	2.00	ac-in	OK
Length of vegetative filter for overflow	-	ft	OK
Distance to structure	105.00	ft	OK
Distance from surface waters	30+	ft	OK
Distance from water supply well(s)	100+	ft	OK
Separation from impervious soil layer	2.00	ft	OK
Naturally occurring soil above shwt	2.00	ft	OK
Bottom covered with 4-in of clean sand?	y	(Y or N)	OK
Proposed drainage easement provided?	y	(Y or N)	OK
Captures all runoff at ultimate build-out?	y	(Y or N)	OK
Bypass provided for larger storms?	N	(Y or N)	Must provide bypass for larger flows
Pretreatment device provided	manhole		

## Infiltration Basin

Please indicate the page or plan sheet numbers where the supporting documentation can be found. An incomplete submittal package will result in a request for additional information. This will delay final review and approval of the project. Initial in the space provided to indicate the following design requirements have been met. If the applicant has designated an agent, the agent may initial below. If a requirement has not been met, attach justification.

Initials	Page/ Plan Sheet No.	Version 1
<u>MV</u>	C3, C5	<p>Plans (1" - 50' or larger) of the entire site showing:</p> <ul style="list-style-type: none"> <li>- Design at ultimate build-out,</li> <li>- Basin dimensions,</li> <li>- Pretreatment system,</li> </ul> <p>1. - High flow bypass system,</p> <ul style="list-style-type: none"> <li>- Maintenance access,</li> <li>- Proposed drainage easement and public right of way (ROW),</li> <li>- Overflow device, and</li> <li>- Boundaries of drainage easement.</li> </ul>
<u>MV</u>	C3, C5	<p>Partial plan (1" = 30' or larger) and details for the infiltration basin showing:</p> <ul style="list-style-type: none"> <li>- Bypass structure,</li> <li>- Maintenance access,</li> </ul> <p>2. - Basin bottom dimensions,</p> <ul style="list-style-type: none"> <li>- Basin cross-section with benchmark for sediment cleanout,</li> <li>- Flow distribution detail for inflow,</li> <li>- Vegetated filter, and</li> <li>- Pretreatment device.</li> </ul>
<u>MV</u>	C3, C5	<p>Section view of the infiltration basin (1" = 20' or larger) showing:</p> <p>3. - Pretreatment and treatment areas, and</p> <ul style="list-style-type: none"> <li>- Inlet and outlet structures.</li> </ul>
<u>MV</u>	attached	<p>4. A table of elevations, areas, incremental volumes &amp; accumulated volumes to verify the volume provided.</p>
<u>MV</u>	attached	<p>A soils report that is based upon an actual field investigation, soil borings, and</p> <p>5. infiltration tests. County soil maps are not an acceptable source of soils information.</p>
<u>MV</u>	C4	<p>6. A construction sequence that shows how the infiltration basin will be protected from sediment until the entire drainage area is stabilized.</p>
<u>MV</u>	attached	<p>7. The supporting calculations.</p>
<u>MV</u>	attached	<p>8. A copy of the signed and notarized operation and maintenance (O&amp;M) agreement.</p>
<u>MV</u>	n/a	<p>9. A copy of the deed restrictions (if required).</p>

- |           |          |   |
|-----------|----------|---|
| <u>MV</u> | attached | 10. 25-yr Discharge < Pre-development Rate  |
| <u>MV</u> | attached | 11. 25-yr Retention Water Elevation _____ < Pond Bank _____                         |
| <u>MV</u> | attached | 12. 100-yr Storm Level _____ < FFE _____  |
| <u>MV</u> | C5       | 13. Outlet structure detail   |
| <u>MV</u> | C3       | 15. Appropriate Outlet to public system   |
| <u>MV</u> | attached | 16. Analysis for the 100-yr Storm   |
| <u>MV</u> | attached | 17. Detailed Calculations for Pre-development & Post-development Discharges         |
| <u>MV</u> | C3, C5   | 18. Emergency spillway elevation _____ 0.5 ft > riser _____                         |
| <u>MV</u> | attached | 19. Detail Calculations of Stage-storage, include. Table                            |
| <u>MV</u> | attached | 20. Detail Computations of Routing Showing at least Time, Storage, Stage, Discharge |
| <u>MV</u> | attached | 21. Emergency Spillway Calculations & Design Data for the 100-yr Storm              |
| <u>MV</u> | attached | 22. Energy Dissipaters Design Data and Calcs. for 25-yr Storms                      |
| <u>MV</u> | C5       | 23. Outlet structures concrete or masonry and minimum barrel size 12 inches         |
| <u>MV</u> | C2, C3   | 24. Utilities greater than 5 feet from pond bank                                    |
| <u>MV</u> | attached | 25. Basin must drawdown in 2 to 5 days.   |



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

## Infiltration Basin Operation and Maintenance Agreement

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

Important maintenance procedures:

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

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

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

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

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

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

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

Project name: Airlie Offices

BMP drainage basin number: 1

Print name: John S. Anderson

Title: Member Manager

Address: 10 S. Cardinal Drive, Wilmington, NC 28403

Phone: 910-616-0483

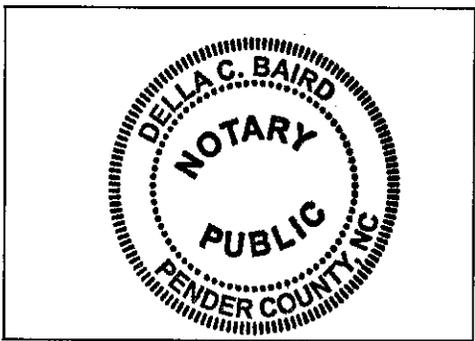
Signature: *John S. Anderson*

Date: 5/19/15

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, Della C. Baird, a Notary Public for the State of North Carolina, County of Pender, do hereby certify that John S. Anderson personally appeared before me this 19 day of May, 2015, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,

*Della C Baird*



SEAL

My commission expires 10-15-16