



## **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: **BRC Wilmington, LLC**  
PROJECT: **Annexe at the Reserve**  
ADDRESS: **315 Covil Ave**  
PERMIT #: **2015035**  
DATE: **Oct 20, 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 10/20/2025 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 10/8/2015.
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.
  - e. Construction of any permitted future areas shown on the approved plans.



**Engineering**

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

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.



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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 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.



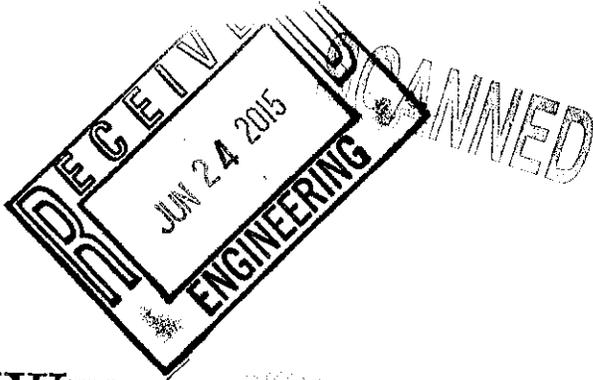
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21. The permit issued shall continue in force and effect until revoked or terminated by the City of Wilmington. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation 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 20<sup>th</sup> day of October, 2015

for Sterling Cheatham, City Manager  
City of Wilmington



Public Services  
 Engineering  
 414 Chestnut St, Suite 200  
 Wilmington, NC 28401  
 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.):

ANNEXE AT THE REVERSE

2. Location of Project (street address):

315 AND 323 COVIL AVE.

City: Wilmington County: New Hanover Zip: \_\_\_\_\_

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

JOINT ON COVIL AVE FROM MARKET STREET

**II. PERMIT INFORMATION**

1. Specify the type of project (check one):  Low Density  High Density  
 Drains to an Offsite Stormwater System  Drainage Plan  Other

If the project drains to an Offsite System, list the Stormwater Permit Number(s):

City of Wilmington: \_\_\_\_\_ State - NCDENR/DWQ: \_\_\_\_\_

2. Is the project currently covered (whole or in part) by an existing City or State (NCDENR/DWQ) Stormwater Permit?  Yes  No

If yes, list all applicable Stormwater Permit Numbers:

City of Wilmington: \_\_\_\_\_ State - NCDENR/DWQ: \_\_\_\_\_

3. Additional Project Permit Requirements (check all applicable):

CAMA Major  Sedimentation/Erosion Control

NPDES Industrial Stormwater  404/401 Permit: Proposed Impacts: 0

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:

\_\_\_\_\_

**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: BRC WILMINGTON LLC

Signing Official & Title: CHRISTOPHER T. DUNBAR, MANAGER

- a. Contact information for Applicant / Signing Official:

Street Address: 5826 JAMET DRIVE, SUITE 105

City: HIGH POINT State: N.C. Zip: 27265

Phone: 336-889-1512 Fax: 336-889-1501 Email: JGUDICH@BLUERIDGECOMPANIES.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: \_\_\_\_\_

Signing Official & Title: \_\_\_\_\_

- a. Contact information for Property Owner:

Street Address: \_\_\_\_\_

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

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

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

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

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

Other Contact Person / Organization: JIM GUDICH

Signing Official & Title: \_\_\_\_\_

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

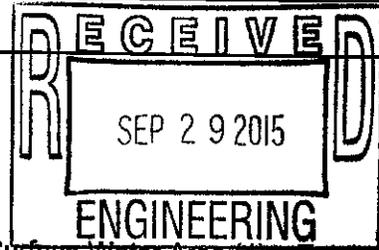
Street Address: 5826 JAMET DRIVE, SUITE 105  
 City: HIGH POINT State: NC. Zip: 27265  
 Phone: 336-889-1512 Fax: 336-889-1507 Email: JGRIKOR@BEVELINECOMPANIES.COM  
 Mailing Address (if different than physical address): \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**IV. PROJECT INFORMATION**

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

STORMWATER WILL BE TREATED BY USE OF PERVIOUS CONCRETE

2. Total Property Area: 278,784 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: 278,784 square feet.  
 6. Existing Impervious Surface within Property Area: 14,039 square feet  
 7. Existing Impervious Surface to be Removed/Demolished: 14,039 square feet  
 8. Existing Impervious Surface to Remain: 0 square feet  
 9. Total Onsite (within property boundary) Newly Constructed Impervious Surface (in square feet):



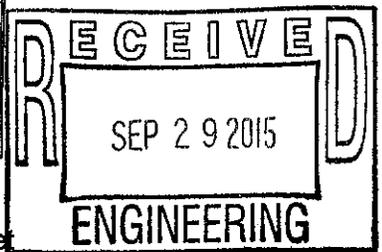
Buildings/Lots	58,2305.F.
Impervious Pavement	1,9045.F.
Pervious Pavement (adj. total, with 75 % credit applied)	22,2132 S.F.
Impervious Sidewalks	13,512 J.F.
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe) <u>CULLS AND GUTTER</u>	7,198 S.F.
Future Development	
<b>Total Onsite Newly Constructed Impervious Surface</b>	<b>103,057</b>

10. Total Onsite Impervious Surface  
 (Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 103,057 square feet

11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 37.0 %

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

Impervious Pavement	
Pervious Pavement (adj. total, with % credit applied)	
Impervious Sidewalks <i>AND CONC. DILUTE APPLICAS</i>	<i>10,336 S.F.</i>
Pervious Sidewalks (adj. total, with % credit applied)	
Other (describe)	
<b>Total Offsite Newly Constructed Impervious Surface</b>	<b><i>10,336</i></b>



13. Total Newly Constructed Impervious Surface  
(Total Onsite + Offsite Newly Constructed Impervious Surface) = *10,336* 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	<i>PERVIOUS CONCRETE</i>	<i>PERVIOUS CONCRETE</i>	<i>PERVIOUS CONCRETE</i>
	(Type of BMP) BMP # 1	(Type of BMP) BMP # 2	(Type of BMP) BMP # 3
Receiving Stream Name	<i>← BURNT MILL CREEK</i>		<i>→</i>
Receiving Stream Index Number	<i>← 18-</i>	<i>74-63-2</i>	<i>→</i>
Stream Classification	<i>← C; SW</i>		<i>→</i>
Total Drainage Area (sf)	<i>19,297.0</i>	<i>162,915.0</i>	<i>21,562.0</i>
On-Site Drainage Area (sf)	<i>19,297</i>	<i>162,915</i>	<i>21,562</i>
Off-Site Drainage Area (sf)	<i>0</i>	<i>0</i>	<i>0</i>
<b>Total Impervious Area (sf)</b>	<b><i>0</i></b>	<b><i>0</i></b>	<b><i>0</i></b>
Buildings/Lots (sf)	<i>8,403</i>	<i>42,116</i>	<i>7,711</i>
Impervious Pavement (sf)	<i>0</i>	<i>1,904</i>	<i>0</i>
Pervious Pavement, 75 % credit (sf)	<i>1,574</i>	<i>18,987</i>	<i>1,652</i>
Impervious Sidewalks (sf)	<i>1,522</i>	<i>10,198</i>	<i>1,792</i>
Pervious Sidewalks, % credit (sf)	<i>0</i>	<i>0</i>	<i>0</i>
Other (sf) <i>CURB &amp; GUTTER</i>	<i>610</i>	<i>5,983</i>	<i>605</i>
Future Development (sf)	<i>0</i>	<i>0</i>	<i>0</i>
Existing Impervious to remain (sf)	<i>0</i>	<i>0</i>	<i>0</i>
Offsite (sf)	<i>0</i>	<i>0</i>	<i>0</i>
Percent Impervious Area (%)	<i>62.7</i>	<i>48.6</i>	<i>59.5</i>

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  
414 Chestnut Street, Suite 200  
Wilmington, NC 28402

**VI. CONSULTANT INFORMATION AND AUTHORIZATION**

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

Consulting Engineer: CHARLES P. TRACY

Consulting Firm: CPT ENGINEERING AND SURVEYING, INC.

a. Contact information for consultant listed above:

Mailing Address: 4100 TYNING ST.

City: HIGH POINT State: N.C. Zip: 27265

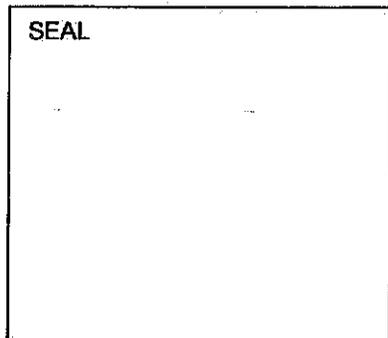
Phone: 336-812-8800 Fax: 336-812-8780 Email: CHUCKT@CPTEENGINEERING.COM

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

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

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

Signature: \_\_\_\_\_ Date: \_\_\_\_\_



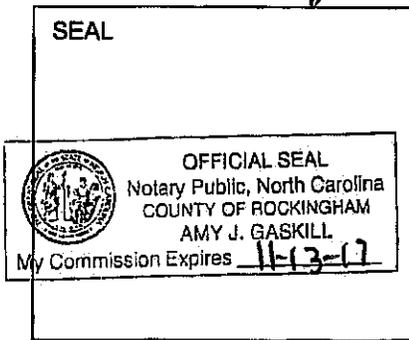
I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_ personally appeared before me this day of \_\_\_\_\_, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

My commission expires: \_\_\_\_\_

**VIII. APPLICANT'S CERTIFICATION**

I, (print or type name of person listed in Contact Information, item 1), Christopher T. Dunbar 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: *Christopher T. Dunbar* Date: 6-16-15



I, Amy J. Gaskill, a Notary Public for the State of North Carolina, County of Rockingham, do hereby certify that Christopher T. Dunbar personally appeared before me this day of June 16, 2015, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,  
*Amy J. Gaskill*  
My commission expires: 11-13-17

Amy J. Gaskill



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	Annexe at the Reserve
Contact Person	Chuck Truby
Phone Number	336-812-8800
Date	1/13/2015
Drainage Area	#1 0.443 Acs.

**II. DESIGN INFORMATION**

**Soils Report Summary**

Hydrologic soil group (HSG) of subgrade	B
Infiltration rate	2.60 in/hr

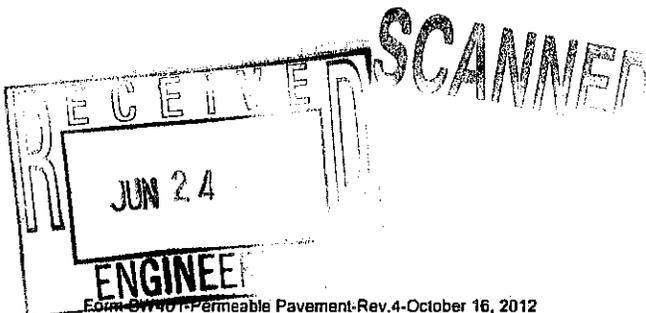
**Pavement Design Summary**

Permeable Pavement (PP) design type	Infiltration - HSG A/B
SA of PP being proposed (A <sub>p</sub> )	6,294 ft <sup>2</sup>
Resulting BUA counted as impervious for main application form	1,574 ft <sup>2</sup>
Adjacent BUA directed to PP (A <sub>c</sub> )	10,535 ft <sup>2</sup>
Ratio of A <sub>c</sub> to A <sub>p</sub>	1.67 (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)	N/A
Layer 2 - Aggregate porosity (n)	N/A (unitless) Please verify; Must be between 0 & 1
Minimum total aggregate depth for design rainfall (D <sub>wq</sub> )	10.0 in
Drawdown/infiltration time for D <sub>wq</sub>	5.0 days OK
How is 10-yr, 24-hr storm handled?	Infiltrated
Aggregate depth to infiltrate 10-yr, 24-hr storm (D <sub>10</sub> )	5.0 in
Drawdown/infiltration time of 10-yr, 24-hr storm	5.00 days
Actual provided total aggregate depth	12.0 in OK
Top of aggregate base layer elevation	32.50 fmsl
Storage elevation of design rainfall depth	31.94 fmsl
Overflow elevation	33.00 fmsl
Bottom elevation at subgrade	31.50 fmsl
SHWT elevation	29.50 fmsl
Underdrain diameter	N/A in

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

Not allowable; Max of 1:1 ratio for other impervious to PP

#REF!



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

Diameter of orifice	_____	in
Coefficient of discharge (C <sub>d</sub> )	_____	(unitless)
Driving head (H <sub>o</sub> )	_____	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	0.50	%	OK
Slope of the permeable pavement surface	0.50	%	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	1		OK
Distance to structure	10.00	ft	
Distance to surface waters	1,700.00	ft	OK
Distance to water supply well(s)	Greater than 100	ft	OK



**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	Annexe at the Reserve
Contact Person	Chuck Truby
Phone Number	336-812-8800
Date	1/13/2015
Drainage Area	#2 3.740 Acs.

**II. DESIGN INFORMATION**

**Soils Report Summary**

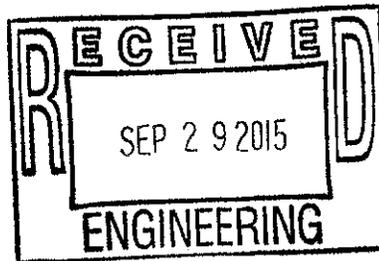
Hydrologic soil group (HSG) of subgrade B  
Infiltration rate 2.50 in/hr

**Pavement Design Summary**

Permeable Pavement (PP) design type	Infiltration - HSG A/B	
SA of PP being proposed ( $A_p$ )	<u>75,948</u>	ft <sup>2</sup>
Resulting BUA counted as impervious for main application form	<u>18,987</u>	ft <sup>2</sup>
Adjacent BUA directed to PP ( $A_c$ )	<u>60,201</u>	ft <sup>2</sup> OK
Ratio of $A_c$ to $A_p$	<u>0.79</u>	(unitless) OK
Flow from pervious surfaces is directed away from PP?	<u>Yes</u>	OK
Design rainfall depth	<u>1.5"</u>	in
Permeable pavement surface course type	<u>PC</u>	
Layer 1 - Washed aggregate size (ex. No. 57)	<u>No. 57</u>	
Layer 1 - Aggregate porosity (n)	<u>0.40</u>	(unitless) OK
Layer 2 - Washed aggregate size (ex. No. 57)	<u>N/A</u>	
Layer 2 - Aggregate porosity (n)	<u>N/A</u>	(unitless) Please verify; Must be between 0 & 1
Minimum total aggregate depth for design rainfall ( $D_{wg}$ )	<u>6.7</u>	in
Drawdown/infiltration time for $D_{wg}$	<u>5.0</u>	days OK
How is 10-yr, 24-hr storm handled?	<u>infiltrated</u>	
Aggregate depth to infiltrate 10-yr, 24-hr storm ( $D_{10}$ )	<u>4.0</u>	in
Drawdown/infiltration time of 10-yr, 24-hr storm	<u>5.00</u>	days
Actual provided total aggregate depth	<u>8.0</u>	in OK
Top of aggregate base layer elevation	<u>31.50</u>	fmsl
Storage elevation of design rainfall depth	<u>31.15</u>	fmsl
Overflow elevation	<u>32.00</u>	fmsl
Bottom elevation at subgrade	<u>30.83</u>	fmsl
SHWT elevation	<u>25.33</u>	fmsl
Underdrain diameter	<u>N/A</u>	in

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

#REF!

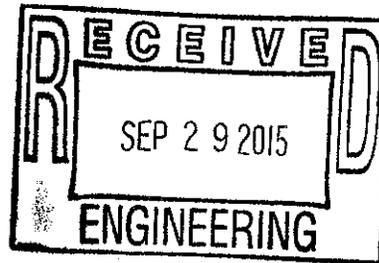


**Detention Systems (skip for infiltration systems)**

Diameter of orifice	in
Coefficient of discharge (C <sub>d</sub> )	(unitless)
Driving head (H <sub>d</sub> )	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	0.50	%	OK
Slope of the permeable pavement surface	0.50	%	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	2		OK
Distance to structure	10.00	ft	
Distance to surface waters	1,700.00	ft	OK
Distance to water supply well(s)	Greater than 100	ft	OK





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	Annexa at the Reserve
Contact Person	Chuck Truby
Phone Number	336-812-8800
Date	1/13/2015
Drainage Area	#3 0.495 Acs.

**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> )	6,609 ft <sup>2</sup>
Resulting BUA counted as impervious for main application form	1,652 ft <sup>2</sup>
Adjacent BUA directed to PP (A <sub>c</sub> )	10,108 ft <sup>2</sup>
Ratio of A <sub>c</sub> to A <sub>p</sub>	1.53 (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)	N/A
Layer 2 - Aggregate porosity (n)	N/A (unitless) Please verify; Must be between 0 & 1
Minimum total aggregate depth for design rainfall (D <sub>wa</sub> )	9.5 in
Drawdown/infiltration time for D <sub>wa</sub>	5.0 days OK
How is 10-yr, 24-hr storm handled?	Infiltrated
Aggregate depth to infiltrate 10-yr, 24-hr storm (D <sub>10</sub> )	6.0 in
Drawdown/infiltration time of 10-yr, 24-hr storm	5.00 days
Actual provided total aggregate depth	12.0 in OK
Top of aggregate base layer elevation	31.50 fmsl
Storage elevation of design rainfall depth	30.99 fmsl
Overflow elevation	32.00 fmsl
Bottom elevation at subgrade	30.50 fmsl
SHWT elevation	28.70 fmsl
Underdrain diameter	N/A in

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

Not allowable; Max of 1:1 ratio for other impervious to PP

#REF!

## 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.

At all times, the pavement shall be kept free of:

- Debris and particulate matter through frequent blowing that removes such debris, particularly during the fall and spring.
- Piles of soil, sand, mulch, building materials or other materials that could deposit particulates on the pavement.
- Piles of snow and ice.
- Chemicals of all kinds, including deicers.

The permeable pavement will be inspected **once a quarter**. 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	Regrade the soil if necessary to remove the gully, then plant ground cover and water until established.
	A vegetated area drains toward the pavement.	Regrade the area so that it drains away from the pavement, then plant ground cover and water until established.
<b>The surface of the permeable pavement</b>	Trash/debris present	Remove the trash/debris.
	Weeds	Do not pull the weeds (may pull out media as well). Spray them with a systemic herbicide such as glyphosate and then return within the week to remove them by hand. (Another option is to pour boiling water on them or steam them.)
	Sediment	Vacuum sweep the pavement.
	Rutting, cracking or slumping or damaged structure	Consult an appropriate professional.
<b>Observation well</b>	Water present more than five days after a storm event	Clean out clogged underdrain pipes. Consult an appropriate professional for clogged soil subgrade.
<b>Educational sign</b>	Missing or is damaged.	Replace the sign.

Permit Number: \_\_\_\_\_  
(to be provided by DWQ)

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

Project name: ANNEXE AT THE RESERVE

BMP drainage area or lot number: PERVIOUS CONCRETE 1, 2, & 3

Print name: Christopher T. Dunbar

Title: Manager

Address: 5826 Samet Drive, Suite 105 High Point, NC 27265

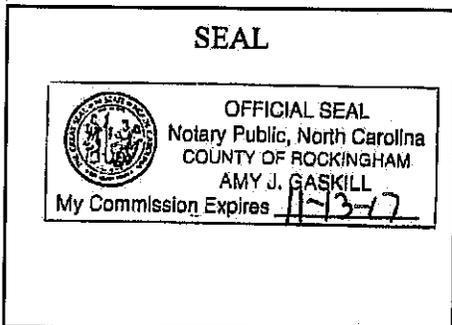
Phone: 336-889-1550

Signature: Christopher T Dunbar

Date: 6-16-15

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, Amy J. Gaskill, a Notary Public for the State of North Carolina, County of Rockingham, do hereby certify that Christopher T. Dunbar personally appeared before me this 16 day of June, 2015, and acknowledge the due execution of the forgoing permeable pavement maintenance requirements. Witness my hand and official seal,



My commission expires 11-13-17  
Amy J. Gaskill