



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: **Wilmington Treatment Center**
 PROJECT: **Wilmington Treatment Center Partial Hospitalization Center**
 ADDRESS: **2651 Carolina Beach Road**
 PERMIT #: **2017032**
 DATE: **August 7, 2017**

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 August 1, 2027 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 August 1, 2017.
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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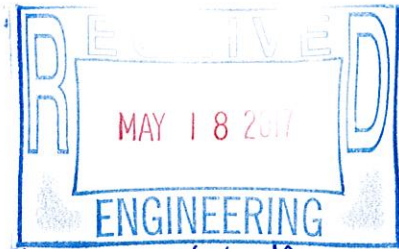
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17. The City of Wilmington may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the 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 7th day of August, 2017.

A handwritten signature in blue ink, appearing to read "Sterling Cheatham", is written over a horizontal line.

for Sterling Cheatham, City Manager
City of Wilmington



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**unless noted otherwise*

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.):

Wilmington Treatment Center PHC and Dorms

2. Location of Project (street address):

2651 Carolina Beach Road

City: Wilmington

County: New Hanover

Zip: 28401

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

South approximately 875 feet from the intersection of Hwy 421(Carolina Beach Road) and Hwy 117 (Shipyard Blvd) on the left.

II. PERMIT INFORMATION

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

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

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

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:

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: Wilmington Treatment Center

Signing Official & Title: Robert Pitts, Vice President

- a. Contact information for Applicant / Signing Official:

Street Address: 2520 Troy Drive

City: Wilmington State: NC Zip: 28401

Phone: 910-815-3336 Fax: 910-815-3339 Email: Robert.Pitts@acadiahealthcare.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: Frank Braxton

Signing Official & Title: Landscape Architect

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

Street Address: 221 N Front Street

City: Wilmington State: NC Zip: 28401

Phone: (910) 520-3347 Fax: (910) 254-0502 Email: fbraxton@cldeng.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 from the site will be treated by a combination of bio-retention areas, infiltration basins, wet extended detention pond, and pervious concrete

2. Total Property Area: 393,610 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: 393,610 square feet.

6. Existing Impervious Surface within Property Area: 86,191 square feet

7. Existing Impervious Surface to be Removed/Demolished: 66,291 square feet

8. Existing Impervious Surface to Remain: 19,900 square feet (Existing entrance drives)

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

Buildings/Lots	47,348
Impervious Pavement	82,244
Pervious Pavement (adj. total, with 100 % credit applied)	0
Impervious Sidewalks	26,573
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe)	
Future Development	29,050
Total Onsite Newly Constructed Impervious Surface	185,215

10. Total Onsite Impervious Surface

(Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 205,115 square feet

11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 52 %

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

Impervious Pavement	0
Pervious Pavement (adj. total, with % credit applied)	0
Impervious Sidewalks	1,628
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe)	0
Total Offsite Newly Constructed Impervious Surface	1,628

(Sidewalk in ROW on Carolina Beach Road and Sidewalk in Northeast Drive Entrance)

13. Total Newly Constructed Impervious Surface
(Total Onsite + Offsite Newly Constructed Impervious Surface) = 186,843 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.

See attached sheet

Basin Information	BMP #	BMP #	BMP #
Receiving Stream Name			
Receiving Stream Index Number			
Stream Classification			
Total Drainage Area (sf)	See attached section 14 showing all BMPs.		
On-Site Drainage Area (sf)			
Off-Site Drainage Area (sf)			
Total Impervious Area (sf)			
Buildings/Lots (sf)			
Impervious Pavement (sf)			
Pervious Pavement (sf)			
Impervious Sidewalks (sf)			
Pervious Sidewalks (sf)			
Other (sf)			
Future Development (sf)			
Existing Impervious to remain (sf)			
Offsite (sf)			
Percent Impervious Area (%)			

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

NA

Application Section IV Line Item 14

Basin Information	BMP#1	BMP#2	BMP#3	BMP#4	BMP#5
Receiving Stream Name	Wet Det Basin Cape Fear River 18-(71) SC	UG Infiltration Basin 1 Cape Fear River 18-(71) SC	Bio-Retention 1 Cape Fear River 18-(71) SC	Bio-Retention 2 Cape Fear River 18-(71) SC	UG Infiltration Basin 2 18-(71) SC
Receiving Stream Index Number	141,771	96,519	31,389	13,527	39,017
Stream Classification	141,771	96,519	31,389	13,527	39,017
Total Drainage Area (sf)	0	0	0	0	0
On-Site Drainage Area (sf)	73,513	59,433	12,287	8,102	30,202
Off-Site Drainage Area (sf)	19,245	28,104	0	0	0
Total Impervious Area (sf)	26,199	16,693	11,789	3,396	27,519
Buildings/Lots (sf)	0	0	0	0	0
Impervious Pavement (sf)	7,369	11,186	498	797	2,683
Pervious Pavement (sf) (adj. total, with 100% credit applied)	0	0	0	0	0
Impervious Sidewalks (sf)	0	0	0	0	0
Pervious Sidewalks (sf)	0	0	0	0	0
Other (sf)	20,700	3,450	0	3,909	0
Future Development (sf)	0	0	0	0	0
Existing Impervious to remain (sf)	0	0	0	0	0
Offsite (sf)	0	0	0	0	0
Percent Impervious Area (%)	52	62	39	60	77

Basin Information	BMP#6	BMP#7	BMP#8
Receiving Stream Name	Pervious Concrete 1 18-(71) SC	Pervious Concrete 2 Cape Fear River 18-(71) SC	Pervious Concrete 3 18-(71) SC
Receiving Stream Index Number	1,279	2,954	2,808
Stream Classification	1,279	2,954	2,808
Total Drainage Area (sf)	0	0	0
On-Site Drainage Area (sf)	309	723	646
Off-Site Drainage Area (sf)	0	0	0
Total Impervious Area (sf)	1,106	2,194	1,997
Buildings/Lots (sf)	0	0	0
Impervious Pavement (sf)	309	723	646
Pervious Pavement Footprint (sf)	0	0	0
Pervious Pavement (sf) (adj. total, with 100% credit applied)	0	0	0
Impervious Sidewalks (sf)	0	0	0
Pervious Sidewalks (sf)	0	0	0
Other (sf)	0	0	0
Future Development (sf)	0	0	0
Existing Impervious to remain (sf)	0	0	0
Offsite (sf)	0	0	0
Percent Impervious Area (%)	24	24	23

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: NA

Consulting Firm: _____

a. Contact information for consultant listed above:

Mailing Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____ Email: _____

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

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

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

SEAL

Signature: NA

Date: _____

I, _____, a Notary Public for the

State of _____, County of _____, do

hereby certify that _____

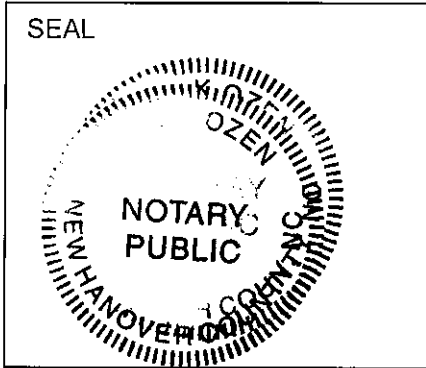
personally appeared before me this day of _____, _____.

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

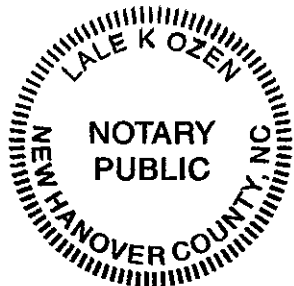
I, (print or type name of person listed in Contact Information, item 1) Robert L Pitts certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed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



Signature: [Handwritten Signature]
Date: 5-11-17

I, Lale K Ozen, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Robert Pitts personally appeared before me this day of May 11, 2017, and acknowledge the due execution of the application for a stormwater

permit. Witness my hand and official seal,
[Handwritten Signature]
My commission expires: 6/12/19



STORMWATER MANAGEMENT PERMIT APPLICATION FORM
 401 CERTIFICATION APPLICATION FORM
BIORETENTION CELL 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	Wilmington Treatment Center PHC
Contact name	Sam Bohannon
Phone number	(615) 370-7894 x110
Date	May 5, 2017
Drainage area number	Post DA 1 - Bio 1 - BMP #3

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	31,389	ft ²
Impervious area	12,287	ft ²
Percent impervious	39.1%	%
Design rainfall depth	1.5	inch
Peak Flow Calculations		
Is pre/post control of the 1-yr, 24-hr peak flow required?	N	(Y or N)
1-yr, 24-hr runoff depth		in
1-yr, 24-hr intensity		in/hr
Pre-development 1-yr, 24-hr peak flow		ft ³ /sec
Post-development 1-yr, 24-hr peak flow		ft ³ /sec
Pre/Post 1-yr, 24-hr peak control		ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum volume required	1,568.0	ft ³
Volume provided	1,865.0	ft ³ OK
Storage Volume: SA Waters		
1.5" runoff volume	NA	ft ³
Pre-development 1-yr, 24-hr runoff		ft ³
Post-development 1-yr, 24-hr runoff		ft ³
Minimum volume required	NA	ft ³
Volume provided		ft ³
Cell Dimensions		
Ponding depth of water	9	inches OK
Ponding depth of water	0.75	ft
Surface area of the top of the bioretention cell	2,196.0	ft ² OK
Length:	115	ft OK
Width:	20	ft OK
-or- Radius		ft
Media and Soils Summary		
Drawdown time, ponded volume	1.68	hr OK
Drawdown time, to 24 inches below surface	1.68	hr OK
Drawdown time, total:	3.36	hr
<i>In-situ soil:</i>		
Soil permeability	12.00	in/hr OK
<i>Planting media soil:</i>		
Soil permeability	6.00	in/hr OK
Soil composition		
% Sand (by weight)	85%	OK
% Fines (by weight)	10%	OK
% Organic (by weight)	5%	OK
Total:	100%	
Phosphorus Index (P-Index) of media	20	(unitless) OK

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Basin Elevations

Temporary pool elevation	51.75	fmsl	
Type of bioretention cell (answer "Y" to only one of the two following questions):			
Is this a grassed cell?	Y	(Y or N)	OK
Is this a cell with trees/shrubs?		(Y or N)	
Planting elevation (top of the mulch or grass sod layer)	51	fmsl	
Depth of mulch	NA	inches	Insufficient mulch depth, unless installing grassed cell.
Bottom of the planting media soil	48.75	fmsl	
Planting media depth	2.25	ft	
Depth of washed sand below planting media soil	0	ft	
Are underdrains being installed?	N	(Y or N)	
How many clean out pipes are being installed?	NA		OK
What factor of safety is used for sizing the underdrains? (See BMP Manual Section 12.3.6)	NA		Insufficient factor of safety.
Additional distance between the bottom of the planting media and the bottom of the cell to account for underdrains	0	ft	
Bottom of the cell required	48.75	fmsl	
SHWT elevation	45.83	fmsl	
Distance from bottom to SHWT	2.92	ft	OK

Internal Water Storage Zone (IWS)

Does the design include IWS	N	(Y or N)	
Elevation of the top of the upturned elbow		fmsl	
Separation of IWS and Surface	51	ft	

Planting Plan

Number of tree species	0		
Number of shrub species	0		
Number of herbaceous groundcover species	1		Recommend more species.

Additional Information

Does volume in excess of the design volume bypass the bioretention cell?	Y	(Y or N)	OK
Does volume in excess of the design volume flow evenly distributed through a vegetated filter?	N	(Y or N)	Excess volume must pass through filter.
What is the length of the vegetated filter?		ft	
Does the design use a level spreader to evenly distribute flow?	N	(Y or N)	Show how flow is evenly distributed.
Is the BMP located at least 30 feet from surface waters (50 feet if SA waters)?	Y	(Y or N)	OK
Is the BMP located at least 100 feet from water supply wells?	Y	(Y or N)	OK
Are the vegetated side slopes equal to or less than 3:1?	Y	(Y or N)	OK
Is the BMP located in a proposed drainage easement with access to a public Right of Way (ROW)?	N	(Y or N)	Insufficient ROW location.
Inlet velocity (from treatment system)	0.5	ft/sec	OK
Is the area surrounding the cell likely to undergo development in the future?	N	(Y or N)	OK
Are the slopes draining to the bioretention cell greater than 20%?	N	(Y or N)	OK
Is the drainage area permanently stabilized?	Y	(Y or N)	OK

Pretreatment Used

(Indicate Type Used with an "X" in the shaded cell)

Gravel and grass (8" inches gravel followed by 3-5 ft of grass)	X		
Grassed swale			OK
Forebay			
Other			

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM
BIORETENTION CELL SUPPLEMENT

This form must be filled out, printed and submitted.

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I. PROJECT INFORMATION

Project name	Wilmington Treatment Center PHC
Contact name	Sam Bohannon
Phone number	(615) 370-7894 x110
Date	May 5, 2017
Drainage area number	Post DA 2 - Bio 2 - BMP #4

II. DESIGN INFORMATION

Site Characteristics

Drainage area	13,527	ft ²
Impervious area	8,102	ft ²
Percent impervious	59.9%	%
Design rainfall depth	1.5	inch

Peak Flow Calculations

Is pre/post control of the 1-yr, 24-hr peak flow required?	N	(Y or N)
1-yr, 24-hr runoff depth		in
1-yr, 24-hr intensity		in/hr
Pre-development 1-yr, 24-hr peak flow		ft ³ /sec
Post-development 1-yr, 24-hr peak flow		ft ³ /sec
Pre/Post 1-yr, 24-hr peak control		ft ³ /sec

Storage Volume: Non-SA Waters

Minimum volume required	1,015.0	ft ³	
Volume provided	1,256.0	ft ³	OK

Storage Volume: SA Waters

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

Cell Dimensions

Ponding depth of water	9	inches	OK
Ponding depth of water	0.75	ft	
Surface area of the top of the bioretention cell	1,328.0	ft ²	Insufficient surface area.
Length:	145	ft	OK
Width:	7 to 10	ft	OK
-or- Radius		ft	

Media and Soils Summary

Drawdown time, ponded volume	1.92	hr	OK
Drawdown time, to 24 inches below surface	1.92	hr	OK
Drawdown time, total:	3.84	hr	

In-situ soil:

Soil permeability	12.00	in/hr	OK
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Planting media soil:

Soil permeability	6.00	in/hr	OK
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Soil composition

% Sand (by weight)	85%	OK
% Fines (by weight)	10%	OK
% Organic (by weight)	5%	OK

Total: 100%

Phosphorus Index (P-Index) of media 20 (unitless) OK

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Basin Elevations

Temporary pool elevation	51.75	fmsl	
Type of bioretention cell (answer "Y" to only one of the two following questions):			
Is this a grassed cell?	Y	(Y or N)	OK
Is this a cell with trees/shrubs?		(Y or N)	
Planting elevation (top of the mulch or grass sod layer)	51	fmsl	
Depth of mulch	NA	inches	Insufficient mulch depth, unless installing grassed cell.
Bottom of the planting media soil	48.75	fmsl	
Planting media depth	2.25	ft	
Depth of washed sand below planting media soil	0	ft	
Are underdrains being installed?	N	(Y or N)	
How many clean out pipes are being installed?	NA		OK
What factor of safety is used for sizing the underdrains? (See BMP Manual Section 12.3.6)	NA		Insufficient factor of safety.
Additional distance between the bottom of the planting media and the bottom of the cell to account for underdrains	0	ft	
Bottom of the cell required	48.75	fmsl	
SHWT elevation	45.83	fmsl	
Distance from bottom to SHWT	2.92	ft	OK

Internal Water Storage Zone (IWS)

Does the design include IWS	N	(Y or N)	
Elevation of the top of the upturned elbow		fmsl	
Separation of IWS and Surface	51	ft	

Planting Plan

Number of tree species	0		
Number of shrub species	0		
Number of herbaceous groundcover species	1		Recommend more species.

Additional Information

Does volume in excess of the design volume bypass the bioretention cell?	Y	(Y or N)	OK
Does volume in excess of the design volume flow evenly distributed through a vegetated filter?	N	(Y or N)	Excess volume must pass through filter.
What is the length of the vegetated filter?		ft	
Does the design use a level spreader to evenly distribute flow?	N	(Y or N)	Show how flow is evenly distributed.
Is the BMP located at least 30 feet from surface waters (50 feet if SA waters)?	Y	(Y or N)	OK
Is the BMP located at least 100 feet from water supply wells?	Y	(Y or N)	OK
Are the vegetated side slopes equal to or less than 3:1?	Y	(Y or N)	OK
Is the BMP located in a proposed drainage easement with access to a public Right of Way (ROW)?	N	(Y or N)	Insufficient ROW location.
Inlet velocity (from treatment system)	0.5	ft/sec	OK
Is the area surrounding the cell likely to undergo development in the future?	N	(Y or N)	OK
Are the slopes draining to the bioretention cell greater than 20%?	N	(Y or N)	OK
Is the drainage area permanently stabilized?	Y	(Y or N)	OK

Pretreatment Used

(Indicate Type Used with an "X" in the shaded cell)

Gravel and grass (8+ inches gravel followed by 3-5 ft of grass)	X		
Grassed swale			OK
Forebay			
Other			



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401 CERTIFICATION APPLICATION FORM

WET DETENTION BASIN SUPPLEMENT

This form must be filled out, printed and submitted.

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

I. PROJECT INFORMATION

Project name	Wilmington Treatment Center PHC
Contact person	Sam Bohannon
Phone number	(615) 370-7964 x110
Date	5/5/2017
Drainage area number	Post DA 23, 25-29, 31-35 - BMP #1

II. DESIGN INFORMATION

Site Characteristics

Drainage area	141,771 ft ²
Impervious area, post-development	73,513 ft ²
% impervious	51.85 %
Design rainfall depth	1.5 in

Storage Volume: Non-SA Waters

Minimum volume required	9,152 ft ³
Volume provided	25,289 ft ³

OK, volume provided is equal to or in excess of volume required.

Storage Volume: SA Waters

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

Peak Flow Calculations

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

Elevations

Temporary pool elevation	51.25 fmsl
Permanent pool elevation	49.50 fmsl
SHWT elevation (approx. at the perm. pool elevation)	46.33 fmsl
Top of 10ft vegetated shelf elevation	50.00 fmsl
Bottom of 10ft vegetated shelf elevation	49.00 fmsl
Sediment cleanout, top elevation (bottom of pond)	45.50 fmsl
Sediment cleanout, bottom elevation	45.00 fmsl
Sediment storage provided	0.50 ft

Insufficient sediment storage provided

Is there additional volume stored above the state-required temp. pool? Y (Y or N)

Elevation of the top of the additional volume	51.3 fmsl
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OK

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II. DESIGN INFORMATION

Surface Areas

Area, temporary pool	16,350 ft ²	
Area REQUIRED, permanent pool	5,167 ft ²	
SA/DA ratio	3.64 (unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	11,530 ft ²	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	9,538 ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	4,222 ft ²	

Volumes

Volume, temporary pool	25,289 ft ³	OK
Volume, permanent pool, V_{perm_pool}	29,781 ft ³	
Volume, forebay (sum of forebays if more than one forebay)	5,295 ft ³	
Forebay % of permanent pool volume	17.8% %	Insufficient forebay volume.

SA/DA Table Data

Design TSS removal	90 %	
Coastal SA/DA Table Used?	Y (Y or N)	
Mountain/Piedmont SA/DA Table Used?	N (Y or N)	
SA/DA ratio	3.64 (unitless)	

Average depth (used in SA/DA table):

Calculation option 1 used? (See Figure 10-2b)	N (Y or N)	
Volume, permanent pool, V_{perm_pool}	29,781 ft ³	
Area provided, permanent pool, A_{perm_pool}	11,530 ft ²	
Average depth calculated	ft	Need 3 ft min.
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)	ft	
Calculation option 2 used? (See Figure 10-2b)	Y (Y or N)	
Area provided, permanent pool, A_{perm_pool}	11,530 ft ²	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	9,538 ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	4,222 ft ²	
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	3.50 ft	
Average depth calculated	3.00 ft	OK
Average depth used in SA/DA, d_{av} , (Round to down to nearest 0.5ft)	3.0 ft	OK

Drawdown Calculations

Drawdown through orifice?	Y (Y or N)	
Diameter of orifice (if circular)	2.00 in	
Area of orifice (if-non-circular)	in ²	
Coefficient of discharge (C_d)	0.60 (unitless)	
Driving head (H_2)	0.75 ft	
Drawdown through weir?	N (Y or N)	
Weir type	(unitless)	
Coefficient of discharge (C_w)	(unitless)	
Length of weir (L)	ft	
Driving head (H)	ft	
Pre-development 1-yr, 24-hr peak flow	ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	ft ³ /sec	
Storage volume discharge rate (through discharge orifice or weir)	0.15 ft ³ /sec	Storage volume discharge rate greater than pre-dev. 1yr24hr.
Storage volume drawdown time	3.65 days	OK, draws down in 2-5 days.

See Wet Pond Calculations in the Drainage Report for the orifice drawdown sizes and calculations.

Additional Information

Vegetated side slopes	3 :1	OK
Vegetated shelf slope	10 :1	OK
Vegetated shelf width	10.0 ft	OK
Length of flowpath to width ratio	3 :1	OK
Length to width ratio	1.5 :1	OK
Trash rack for overflow & orifice?	Y (Y or N)	OK
Freeboard provided	1.0 ft	OK
Vegetated filter provided?	N (Y or N)	OK
Recorded drainage easement provided?	N (Y or N)	Insufficient. Recorded drainage easement required.
Capures all runoff at ultimate build-out?	Y (Y or N)	OK
Drain mechanism for maintenance or emergencies is:	Overflow to drive at elevation 53.50. Pump will be provided by owner.	

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INFILTRATION TRENCH SUPPLEMENT

This form must be filled out, printed and submitted.

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I. PROJECT INFORMATION

Project name	Wilmington Treatment Center Partial Hospitalization Center
Contact person	Sam Bohannon
Phone number	615-370-7964
Date	13-Jun-17
Drainage area number	Post DA 6-9, 17-19 - UG 1- BMP #2

II. DESIGN INFORMATION

Site Characteristics

Drainage area	96,519.00	ft ²
Impervious area	59,433.00	ft ²
Percent impervious	61.6%	%
Design rainfall depth	1.50	in

Peak Flow Calculations

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

Storage Volume: Non-SA Waters

Minimum volume required	7 4,268.00	ft ³	OK for non-SR waters
Volume provided	14,858.00	ft ³	

pac - per calculations

Storage Volume: SA Waters

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

Soils Report Summary

Soil type	Wakulla Soils
Infiltration rate	10.00 in/hr
SHWT elevation	43.33 fmsl

Trench Design Parameters

Drawdown time	0.25	days	OK
Perforated pipe diameter	3'Hx7"Wx15'L Box	in	
Perforated pipe length	128' and 48'	ft	
Number of laterals	5 and 4		
Stone type (if used)	#57		
Stone void ratio	0.4		
Stone is free of fines?	Y	(Y or N)	OK

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Trench Elevations

Bottom elevation	<u>47.00</u>	fmsl	OK
Storage/overflow elevation	<u>49.50</u>	fmsl	
Top elevation	<u>50.00</u>	fmsl	

Trench Dimensions

Length (long dimension)	<u>128.00</u>	ft	
Width (short dimension)	<u>72.00</u>	ft	
Height (depth)	<u>3.00</u>	ft	OK

Additional Information

Maximum volume to each inlet into the trench?	<u>0.50</u>	ac-in	OK
Length of vegetative filter for overflow	<u>NA</u>	ft	OK
Number of observation wells	<u>MH Access</u>		OK
Distance to structure	<u>15.00</u>	ft	OK
Distance from surface waters	<u>NA</u>	ft	OK
Distance from water supply well(s)	<u>NA</u>	ft	OK
Separation from impervious soil layer	<u>NA</u>	ft	OK
Depth of naturally occurring soil above SHWT	<u>2.00</u>	ft	OK
Bottom covered with 4-in of clean sand?	<u>N</u>	(Y or N)	Must cover bottom with 4-in of clean sand
Proposed drainage easement provided?	<u>N</u>	(Y or N)	Need a recorded drainage easement
Captures all runoff at ultimate build-out?	<u>Y</u>	(Y or N)	OK
Bypass provided for larger storms?	<u>Y</u>	(Y or N)	OK
Trench wrapped with geotextile fabric?	<u>N</u>	(Y or N)	Must completely wrap trench with geotextile fabric
Pretreatment device provided			

Catch Basin Sumps

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INFILTRATION TRENCH SUPPLEMENT

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I. PROJECT INFORMATION

Project name	Wilmington Treatment Center Partial Hospitalization Center
Contact person	Sam Bohannon
Phone number	615-370-7964
Date	13-Jun-17
Drainage area number	Post DA 4, 5, 11, 13, 14, 22, 36, 37 - UG 2- BMP #5

II. DESIGN INFORMATION

Site Characteristics

Drainage area	39,017.00	ft ²
Impervious area	30,202.00	ft ²
Percent impervious	77.4%	%
Design rainfall depth	1.50	in

Peak Flow Calculations

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

Storage Volume: Non-SA Waters

Minimum volume required	3,625.00	ft ³	
Volume provided	11,371.00	ft ³	OK for non-SR waters

Storage Volume: SA Waters

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

Soils Report Summary

Soil type	Wakulla Soils
Infiltration rate	10.00 in/hr
SHWT elevation	43.33 fmsl

Trench Design Parameters

Drawdown time	0.26	days	OK
Perforated pipe diameter	4Hx7Wx15L Box	in	
Perforated pipe length	256.00	ft	
Number of laterals	2		
Stone type (if used)	#57		
Stone void ratio	0.4		
Stone is free of fines?	Y	(Y or N)	OK

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Trench Elevations

Bottom elevation	47.00	fmsl	OK
Storage/overflow elevation	49.50	fmsl	
Top elevation	50.00	fmsl	

Trench Dimensions

Length (long dimension)	256.00	ft	
Width (short dimension)	16.00	ft	
Height (depth)	4.00	ft	OK

Additional Information

Maximum volume to each inlet into the trench?	0.50	ac-in	OK
Length of vegetative filter for overflow	NA	ft	OK
Number of observation wells	MH Access		OK
Distance to structure	25.00	ft	OK
Distance from surface waters	NA	ft	OK
Distance from water supply well(s)	NA	ft	OK
Separation from impervious soil layer	NA	ft	OK
Depth of naturally occurring soil above SHWT	2.00	ft	OK
Bottom covered with 4-in of clean sand?	N	(Y or N)	Must cover bottom with 4-in of clean sand
Proposed drainage easement provided?	N	(Y or N)	Need a recorded drainage easement
Captures all runoff at ultimate build-out?	Y	(Y or N)	OK
Bypass provided for larger storms?	Y	(Y or N)	OK
Trench wrapped with geotextile fabric?	N	(Y or N)	Must completely wrap trench with geotextile fabric
Pretreatment device provided			

Catch Basin Sumps



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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	Wilmington Treatment Center PHC
Contact Person	Sam Bohannon
Phone Number	(615) 370-7894 x110
Date	5/5/2017
Drainage Area	Post DA 10 - PC 1 - BMP #6

II. DESIGN INFORMATION

Soils Report Summary	
Hydrologic soil group (HSG) of subgrade	A
Infiltration rate	12.00 in/hr
Pavement Design Summary	
Permeable Pavement (PP) design type	Infiltration - HSG A/B
SA of PP being proposed (A_p)	1,106 ft ²
Resulting BUA counted as impervious for main application form	277 ft ² <i>o rac</i>
Adjacent BUA directed to PP (A_c)	309 ft ² <i>Rac</i>
Ratio of A_c to A_p	0.28 (unitless) OK
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)
Minimum total aggregate depth for design rainfall (D_{wq})	5.0 in
Drawdown/infiltration time for D_{wq}	0.1 days OK
How is 10-yr, 24-hr storm handled?	bypassed Underdrain Required
Aggregate depth to infiltrate 10-yr, 24-hr storm (D_{10})	
Drawdown/infiltration time of 10-yr, 24-hr storm	
Actual provided total aggregate depth	12.0 in OK
Top of aggregate base layer elevation	53.66 fmsl
Storage elevation of design rainfall depth	53.08 fmsl
Overflow elevation	54.16 fmsl
Bottom elevation at subgrade	52.66 fmsl
SHWT elevation	42.33 fmsl
Underdrain diameter	NA in

BUA Credit for Permeable Pavement Footprint:
100% - 75% BUA Credit

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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 ³ /sec
Storage volume drawdown time	_____	days
Pre-development 1-yr, 24-hr peak flow	_____	ft ³ /sec
Post-development 1-yr, 24-hr peak flow	_____	ft ³ /sec

Additional Information

Slope of soil subgrade at bottom of permeable pavement	_____	2.00	%	Over 0.5%, requires baffles, berms, or terracing <i>rac</i>
Slope of the permeable pavement surface	_____	2.00	%	OK
Construction sequence minimizes compaction to soils?	_____	Yes		OK
Subsoil preparation specified (must select one)	_____	trenched		
Meets industry standards for structural requirements?	_____	Yes		OK
<u>Washed</u> stone is specified for the aggregate?	_____	Yes		OK
Required signage specified on plans?	_____	No		Signage must be specified on the plans <i>rac</i>
Number of observation wells provided	_____	1		OK
Distance to structure	_____	18.00	ft	
Distance to surface waters	_____	30+	ft	OK
Distance to water supply well(s)	_____	NA	ft	OK

III. REQUIRED ITEMS CHECKLIST	
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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.
1. Plans (1" = 50' or larger) of the entire site showing: - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Location of permeable pavement, - Roof and other surface flow directed away from permeable pavement, - Location of the permeable pavement sign(s).		C200 and C401
2. Section view of the permeable pavement (1" = 20' or larger) showing: - All layers (including details about the surface course), and - SHWT		C210
3. A detail of what the permeable pavement sign.		C210
4. A site specific soils report that is based upon an actual field investigation, soil borings, and infiltration tests within the footprint of the proposed permeable pavement. The soils investigation shall state the infiltration rate, SHWT elevation, and information about any confining layers. County soil maps are not an acceptable source of soils information. (Projects in the WIRO - The results of the soils report must be verified in the field by DWQ, by completing & submitting the soils investigation request form.)		Infiltration Report and Geotech
5. A construction sequence that shows how the permeable pavement will be protected from sediment until the entire drainage area is stabilized.		C210
6. The supporting calculations.		Drainage Narrative
7. A copy of the signed and notarized operation and maintenance (O&M) agreement.		Attached
8. A copy of the deed restrictions (if required).		NA



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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	Wilmington Treatment Center PHC
Contact Person	Sam Bohannon
Phone Number	(615) 370-7894 x110
Date	5-May-17
Drainage Area	Post DA 15 - PC 2 - BMP #7

II. DESIGN INFORMATION

Soils Report Summary

Hydrologic soil group (HSG) of subgrade	A
Infiltration rate	12.00 in/hr

Pavement Design Summary

Permeable Pavement (PP) design type	Infiltration - HSG A/B	
SA of PP being proposed (A_p)	2,194	ft ²
Resulting BUA counted as impervious for main application form	545 0	ft ²
Adjacent BUA directed to PP (A_c)	723	ft ²
Ratio of A_c to A_p	0.33	(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)
Minimum total aggregate depth for design rainfall (D_{wq})	5.0	in
Drawdown/infiltration time for D_{wq}	0.1	days
How is 10-yr, 24-hr storm handled?	bypassed	OK Underdrain Required
Aggregate depth to infiltrate 10-yr, 24-hr storm (D_{10})		in
Drawdown/infiltration time of 10-yr, 24-hr storm		days
Actual provided total aggregate depth	12.0	in
Top of aggregate base layer elevation	52.45	fmsl
Storage elevation of design rainfall depth	51.87	fmsl
Overflow elevation	52.95	fmsl
Bottom elevation at subgrade	51.45	fmsl
SHWT elevation	42.33	fmsl
Underdrain diameter	NA	in

BUA Credit for Permeable Pavement Footprint:
100% ~~75%~~ BUA Credit

Rac *rac*

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Detention Systems (skip for infiltration systems)

Diameter of orifice	_____	in
Coefficient of discharge (C _d)	_____	(unitless)
Driving head (H ₀)	_____	ft
Storage volume discharge rate (through discharge orifice)	_____	ft ³ /sec
Storage volume drawdown time	_____	days
Pre-development 1-yr, 24-hr peak flow	_____	ft ³ /sec
Post-development 1-yr, 24-hr peak flow	_____	ft ³ /sec

Additional Information

Slope of soil subgrade at bottom of permeable pavement	_____	2.00	%	Over 0.5%, requires baffles, berms, or terracing	<i>Rac</i>
Slope of the permeable pavement surface	_____	2.00	%	OK	
Construction sequence minimizes compaction to soils?	_____	Yes		OK	
Subsoil preparation specified (must select one)	_____	trenched			
Meets industry standards for structural requirements?	_____	Yes		OK	
<u>Washed</u> stone is specified for the aggregate?	_____	Yes		OK	
Required signage specified on plans?	_____	No		Signage must be specified on the plans	<i>Rac</i>
Number of observation wells provided	_____	1		OK	
Distance to structure	_____	18.00	ft		
Distance to surface waters	_____	30+	ft	OK	
Distance to water supply well(s)	_____	NA	ft	OK	

III. REQUIRED ITEMS CHECKLIST	
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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.
1. Plans (1" = 50' or larger) of the entire site showing: - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Location of permeable pavement, - Roof and other surface flow directed away from permeable pavement, - Location of the permeable pavement sign(s).	_____	C200 and C401
2. Section view of the permeable pavement (1" = 20' or larger) showing: - All layers (including details about the surface course), and - SHWT	_____	C210
3. A detail of what the permeable pavement sign.	_____	C210
4. A site specific soils report that is based upon an actual field investigation, soil borings, and infiltration tests within the footprint of the proposed permeable pavement. The soils investigation shall state the infiltration rate, SHWT elevation, and information about any confining layers. County soil maps are not an acceptable source of soils information. (Projects in the WiRO - The results of the soils report must be verified in the field by DWQ, by completing & submitting the soils investigation request form.)	_____	Infiltration Report and Geotech
5. A construction sequence that shows how the permeable pavement will be protected from sediment until the entire drainage area is stabilized.	_____	C210
6. The supporting calculations.	_____	Drainage Narrative
7. A copy of the signed and notarized operation and maintenance (O&M) agreement.	_____	Attached
8. A copy of the deed restrictions (if required).	_____	NA



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	Wilmington Treatment Center PHC
Contact Person	Sam Bohannon
Phone Number	(615) 370-7894 x110
Date	5-May-17
Drainage Area	Post DA 16 - PC 3 - BMP #8

II. DESIGN INFORMATION

Soils Report Summary			
Hydrologic soil group (HSG) of subgrade	A		
Infiltration rate	12.00	in/hr	
Pavement Design Summary			
Permeable Pavement (PP) design type	Infiltration - HSG A/B		
SA of PP being proposed (A_p)	1,997	ft ²	
Resulting BUA counted as impervious for main application form	499 0	ft ²	<i>rac</i>
Adjacent BUA directed to PP (A_c)	646	ft ²	OK
Ratio of A_c to A_p	0.32	(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)	
Minimum total aggregate depth for design rainfall (D_{wq})	5.0	in	
Drawdown/infiltration time for D_{wq}	0.1	days	OK
How is 10-yr, 24-hr storm handled?	bypassed		Underdrain Required
Aggregate depth to infiltrate 10-yr, 24-hr storm (D_{10})		in	
Drawdown/infiltration time of 10-yr, 24-hr storm		days	
Actual provided total aggregate depth	12.0	in	OK
Top of aggregate base layer elevation	51.48	fmsl	
Storage elevation of design rainfall depth	50.90	fmsl	
Overflow elevation	51.98	fmsl	
Bottom elevation at subgrade	50.48	fmsl	
SHWT elevation	42.33	fmsl	
Underdrain diameter	NA	in	

BUA Credit for Permeable Pavement Footprint:
100% 76% BUA Credit

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 (to be provided by DWQ)

Detention Systems (skip for infiltration systems)

Diameter of orifice	_____	in
Coefficient of discharge (C _d)	_____	(unitless)
Driving head (H ₀)	_____	ft
Storage volume discharge rate (through discharge orifice)	_____	ft ³ /sec
Storage volume drawdown time	_____	days
Pre-development 1-yr, 24-hr peak flow	_____	ft ³ /sec
Post-development 1-yr, 24-hr peak flow	_____	ft ³ /sec

Additional Information

Slope of soil subgrade at bottom of permeable pavement	2.00	%	Over 0.5%, requires baffles, berms, or terracing. <i>Rac</i>
Slope of the permeable pavement surface	2.00	%	OK
Construction sequence minimizes compaction to soils?	Yes		OK
Subsoil preparation specified (must select one)	trenched		
Meets industry standards for structural requirements?	Yes		OK
<u>Washed</u> stone is specified for the aggregate?	Yes		OK
Required signage specified on plans?	No		Signage must be specified on the plans <i>Rac</i>
Number of observation wells provided	1		OK
Distance to structure	18.00	ft	
Distance to surface waters	30+	ft	OK
Distance to water supply well(s)	NA	ft	OK

III. REQUIRED ITEMS CHECKLIST	
--------------------------------------	--

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.
1. Plans (1" = 50' or larger) of the entire site showing: - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Location of permeable pavement, - Roof and other surface flow directed away from permeable pavement, - Location of the permeable pavement sign(s).	_____	C200 and C401
2. Section view of the permeable pavement (1" = 20' or larger) showing: - All layers (including details about the surface course), and - SHWT	_____	C210
3. A detail of what the permeable pavement sign.	_____	C210
4. A site specific soils report that is based upon an actual field investigation, soil borings, and infiltration tests within the footprint of the proposed permeable pavement. The soils investigation shall state the infiltration rate, SHWT elevation, and information about any confining layers. County soil maps are not an acceptable source of soils information. (Projects in the WiRO - The results of the soils report must be verified in the field by DWQ, by completing & submitting the soils investigation request form.)	_____	Infiltration Report and Geotech
5. A construction sequence that shows how the permeable pavement will be protected from sediment until the entire drainage area is stabilized.	_____	C210
6. The supporting calculations.	_____	Drainage Narrative
7. A copy of the signed and notarized operation and maintenance (O&M) agreement.	_____	Attached
8. A copy of the deed restrictions (if required).	_____	NA

Bioretention 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:

- Immediately after the bioretention cell is established, the plants will be watered twice weekly if needed until the plants become established (commonly six weeks).
- Snow, mulch or any other material will NEVER be piled on the surface of the bioretention cell.
- Heavy equipment will NEVER be driven over the bioretention cell.
- Special care will be taken to prevent sediment from entering the bioretention cell.
- Once a year, a soil test of the soil media will be conducted.

After the bioretention cell is established, I will inspect it **once a month 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 problems:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the bioretention cell	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, stone verge 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.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and clogged stone and replace with clean stone.

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BMP element:	Potential problems:	How I will remediate the problem:
The pretreatment area	Flow is bypassing pretreatment area and/or gullies have formed.	Regrade if necessary to route all flow to the pretreatment area. Restabilize the area after grading.
	Sediment has accumulated to a depth greater than three inches.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and restabilize the pretreatment area.
	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.
The bioretention cell: vegetation	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.
	Tree stakes/ wires are present six months after planting.	Remove tree stake/ wires (which can kill the tree if not removed).
The bioretention cell: soils and mulch	Mulch is breaking down or has floated away.	Spot mulch if there are only random void areas. Replace whole mulch layer if necessary. Remove the remaining mulch and replace with triple shredded hard wood mulch at a maximum depth of three inches.
	Soils and/or mulch are clogged with sediment.	Determine the extent of the clogging - remove and replace either just the top layers or the entire media as needed. Dispose of the spoil in an appropriate off-site location. Use triple shredded hard wood mulch at a maximum depth of three inches. Search for the source of the sediment and remedy the problem if possible.
	An annual soil test shows that pH has dropped or heavy metals have accumulated in the soil media.	Dolomitic lime shall be applied as recommended per the soil test and toxic soils shall be removed, disposed of properly and replaced with new planting media.

BMP element:	Potential problems:	How I will remediate the problem:
The underdrain system (if applicable)	Clogging has occurred.	Wash out the underdrain system.
The drop inlet	Clogging has occurred.	Clean out the drop inlet. Dispose of the sediment off-site.
	The drop inlet is damaged	Repair or replace the drop inlet.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

Permit Number: _____
(to be provided by 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: Wilmington Treatment Center Partial Hospitalization Center and Dormitory

BMP drainage area number: BMP #3, BMP #4

Print name: Robert Pitts

Title: CEO

Address: 2520 Troy Drive

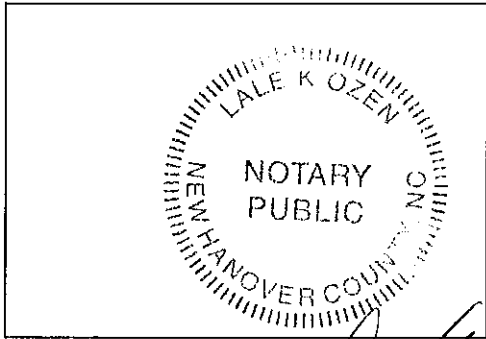
Phone: 910 254-5434

Signature: *Robert Pitts*

Date: 5-11-17

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

I, Lale K. Ozen, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Robert Pitts personally appeared before me this 11th day of May, 2017, and acknowledge the due execution of the forgoing bioretention maintenance requirements. Witness my hand and official seal,



SEAL

Lale K. Ozen

My commission expires 6/12/19

Permit Number: _____

(to be provided by City of Wilmington)

BMP Drainage Basin #: _____

Wet Detention Basin Operation and Maintenance Agreement

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

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

This system (check one):

does does not incorporate a vegetated filter at the outlet.

This system (check one):

does does not incorporate pretreatment other than a forebay.

Important maintenance procedures:

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

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

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

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

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

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

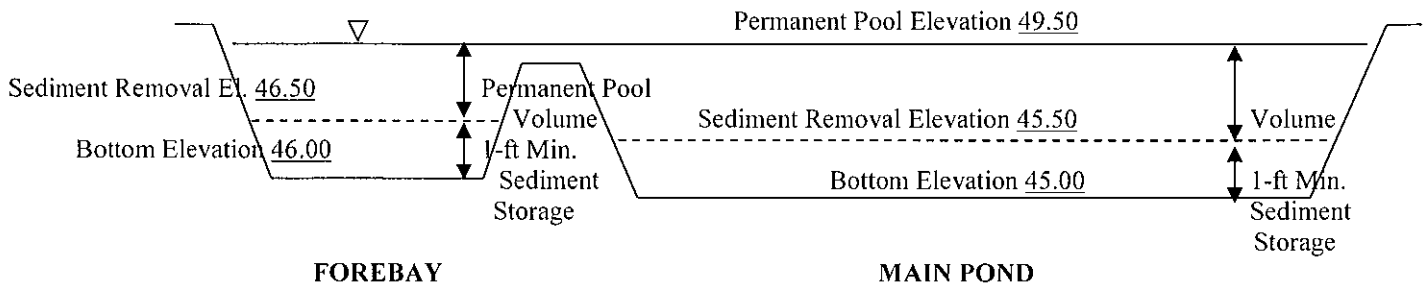
BMP element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails or other invasive plants cover >25% of the veg't shelf. A monoculture of plants must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

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

When the permanent pool depth reads 4.00 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 3.00 feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM
 (fill in the blanks)



Permit Number: _____
(to be provided by ~~XXXX~~
COW)

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: Wilmington Treatment Center Partial Hospitalization Center and Dormitory

BMP drainage area number: BMP #1

Print name: Robert Pitts

Title: CEO

Address: 2520 Troy Drive

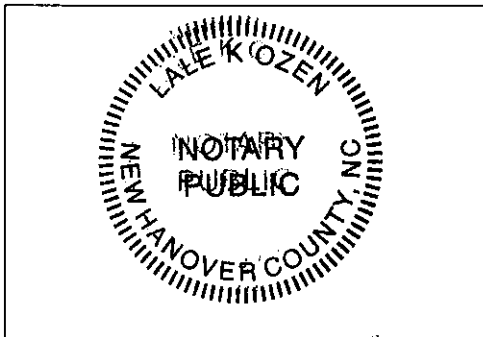
Phone: 910 254-5434

Signature: [Handwritten Signature]

Date: 5-11-17

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

I, Lale K. Ozen, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Robert Pitts personally appeared before me this 11th day of May, 2017, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



SEAL

[Handwritten Signature]
My commission expires 6/12/19

Infiltration Trench 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 of the infiltration trench will be carefully managed to reduce the sediment load to the sand filter.
- The water level in the monitoring wells will be recorded once a month and after every storm event greater than 1.5 inches if in a Coastal County.

The infiltration trench 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 grass filter strip or other pretreatment area	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.
	Sediment has accumulated to a depth of greater than six inches.	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.
The flow diversion structure (if applicable)	The structure is clogged.	Unclog the conveyance and dispose of any sediment off-site.
	The structure is damaged.	Make any necessary repairs or replace if damage is too large for repair.

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BMP element:	Potential problem:	How I will remediate the problem:
The trench	Water is ponding on the surface for more than 24 hours after a storm.	Remove the accumulated sediment from the infiltration system and dispose in a location that will not impact a stream or the BMP.
	The depth in the trench is reduced to 75% of the original design depth.	Remove the accumulated sediment from the infiltration system and dispose in a location that will not impact a stream or the BMP.
	Grass or other plants are growing on the surface of the trench.	Remove the plants, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The observation well(s)	The water table is within one foot of the bottom of the system for a period of three consecutive months.	Contact the DWQ Stormwater Unit immediately at 919-733-5083.
	The outflow pipe is clogged.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	The outflow pipe is damaged.	Repair or replace the pipe.
The emergency overflow berm	Erosion or other signs of damage have occurred at the outlet.	The emergency overflow berm will be repaired or replaced if beyond repair.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

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

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

Project name: Wilmington Treatment Center Partial Hospitalization Center and Dormitory

BMP drainage basin number: BMP #5

Print name: Robert Pitts

Title: CEO

Address: 2520 Troy Drive

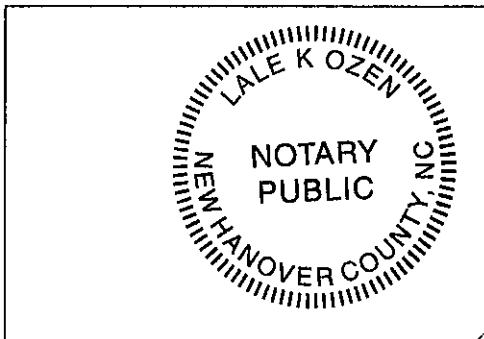
Phone: 910 254-5434

Signature: [Handwritten Signature]

Date: 5-11-17

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

I, Lale K. Ozen, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Robert Pitts personally appeared before me this 11th day of May, 2017, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,



SEAL

[Handwritten Signature]

My commission expires 6/12/19

Infiltration Trench 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 of the infiltration trench will be carefully managed to reduce the sediment load to the sand filter.
- The water level in the monitoring wells will be recorded once a month and after every storm event greater than 1.5 inches if in a Coastal County.

The infiltration trench 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 grass filter strip or other pretreatment area	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.
	Sediment has accumulated to a depth of greater than six inches.	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.
The flow diversion structure (if applicable)	The structure is clogged.	Unclog the conveyance and dispose of any sediment off-site.
	The structure is damaged.	Make any necessary repairs or replace if damage is too large for repair.

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BMP element:	Potential problem:	How I will remediate the problem:
The trench	Water is ponding on the surface for more than 24 hours after a storm.	Remove the accumulated sediment from the infiltration system and dispose in a location that will not impact a stream or the BMP.
	The depth in the trench is reduced to 75% of the original design depth.	Remove the accumulated sediment from the infiltration system and dispose in a location that will not impact a stream or the BMP.
	Grass or other plants are growing on the surface of the trench.	Remove the plants, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The observation well(s)	The water table is within one foot of the bottom of the system for a period of three consecutive months.	Contact the DWQ Stormwater Unit immediately at 919-733-5083.
	The outflow pipe is clogged.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	The outflow pipe is damaged.	Repair or replace the pipe.
The emergency overflow berm	Erosion or other signs of damage have occurred at the outlet.	The emergency overflow berm will be repaired or replaced if beyond repair.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

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

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

Project name: Wilmington Treatment Center Partial Hospitalization Center and Dormitory

BMP drainage basin number: BMP #2

Print name: Robert Pitts

Title: CEO

Address: 2520 Troy Drive

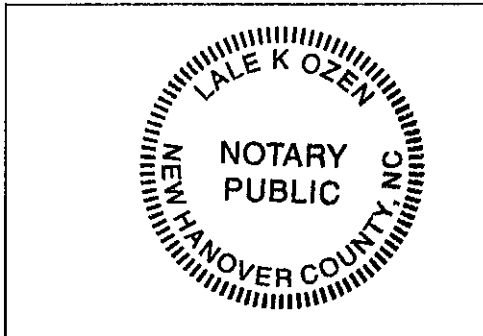
Phone: 910 254-5434

Signature: *Robert Pitts*

Date: 5-11-17

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

I, Lale K. Ozen, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Robert Pitts personally appeared before me this 11th day of May, 2017, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,



SEAL

Lale K Ozen

My commission expires 6/12/17

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:

BMP element:	Potential problem:	How to remediate the problem:
The perimeter of the permeable pavement	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.
The surface of the permeable pavement	Rutting / uneven settlement	This indicates inadequate compaction of the pavement base / sub-base. If rutting or uneven settlement on the order of ½ 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.

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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.

BMP element:	Potential problem:	How to remediate the problem:
The perimeter of the permeable pavement	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).
The surface of the permeable pavement	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 ~~DWFO~~
CoW)

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

Project name: Wilmington Treatment Center Partial Hospitalization Center and Dormitory

BMP drainage area or lot number: BMP #6, BMP #7, BMP #8

Print name: Robert Pitts

Title: CEO

Address: 2520 Troy Drive

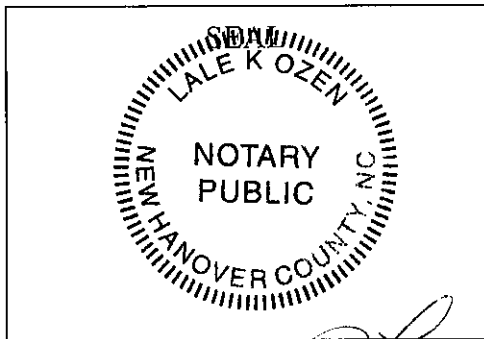
Phone: 910 254-5434

Signature: [Handwritten Signature]

Date: 5-11-17

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

I, Lale K. Ozen, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Robert Pitts personally appeared before me this 11th day of May, 2017, and acknowledge the due execution of the forgoing permeable pavement maintenance requirements. Witness my hand and official seal,



My commission expires [Handwritten Signature] 6/12/19