CITY OF WILMINGTON
NORTH CAROLINA

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

January 25, 2019

Mr. Robert Pitts, CEO
Wilmington Treatment Center
2520 Troy Drive
Wilmington, NC 28401

Subject: **Stormwater Management Permit No. 2017032R2**
Wilmington Treatment Center Partial Hospitalization Center and Dorms
High Density Development

Dear Mr. Pitts:

The City of Wilmington Engineering Division has received a request for a revision to the Stormwater Management Permit for Wilmington Treatment Center Partial Hospitalization Center and Dorms. Having reviewed the application and all supporting materials, the City of Wilmington has determined that the proposed revision meets the requirements of the City of Wilmington's Comprehensive Stormwater Ordinance.

The revisions include:

Revisions include decreasing future impervious allocation due to the addition of 2 gazebos and 3 exercise stations (20'x20' each). Future impervious allocation has been reduced from 29,050 square feet to 27,744 square feet.

Please be aware all terms and conditions of the permit Issued on August 7, 2017 remain in full force and effect. Any additional changes to the approved plans must be approved by this office prior to construction. The issuance of the plan revision does not preclude the permittee from complying with all other applicable statutes, rules, regulations or ordinances which may have jurisdiction over the proposed activity, and obtaining a permit or approval prior to construction.

The revised stamped, approved stormwater management drawings will be released for construction by the Wilmington Planning Division under separate cover. Please replace any old plan sheets from the approved set with the new, revised sheet. An electronic copy of the approved drawing set, permit, application and supplementary documents will be maintained by the Wilmington Engineering Division. If you have any questions, or need additional information, please contact Richard Christensen at (910) 341-7813 or richard.christensen@wilmingtonnc.gov

Sincerely,

for Sterling Cheatham, City Manager
City of Wilmington

cc: Sam Bohannon, PE, Ingram Civil Engineering Group
Brian Chambers, Senior Planner, City of Wilmington

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CITY OF WILMINGTON
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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
(Form SWP 2.2)

I. GENERAL INFORMATION

1. Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):
   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 X High Density
   Drains to an Offsite Stormwater System X 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 X 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 X Sedimentation/Erosion Control
   NPDES Industrial Stormwater 404/401 Permit: Proposed Impacts: _____
   If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit:

   _____

CITY OF WILMINGTON ENGINEERING

III. CONTACT INFORMATION

1. Print Applicant / Signing Official's name and title (specifically the developer, property owner, lessee, designated government official, individual, etc. who owns the project):

   Applicant / Organization: Wilmington Treatment Center

   Signing Official & Title: Robert Pitts, CEO

   a. Contact information for Applicant / Signing Official:

   Street Address: 2520 Troy Drive

   City: Wilmington State: NC Zip: 28401

   Phone: 910-254-5434 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:

   X The property owner (Skip to item 3)
   Lessee* (Attach a copy of the lease agreement and complete items 2 and 2a below)
   Purchaser* (Attach a copy of the pending sales agreement and complete items 2 and 2a below)
   Developer* (Complete items 2 and 2a below.)

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

   Property Owner / Organization: _____

   Signing Official & Title: _____

   a. Contact information for Property Owner:

   Street Address: _____

   City: _____ State: _____ Zip: _____

   Phone: _____ Fax: _____ Email: _____

   Mailing Address (if different than physical address): _____

   City: _____ State: _____ Zip: _____

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

   Other Contact Person / Organization: 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 acombination 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	27,879	
Pervious Sidewalks (adj. total, with % credit applied)	0	
Other (describe)		
Future Development	27,744	
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)			
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 (%)			

See attached section 14 showing all BMPs.

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

NA

Application Section IV Line Item 14

Basin Information	BMP#1 Wet Det Basin	BMP#2 UG Infiltration Basin 1	BMP#3 Bio-Retention 1	BMP#4 Bio-Retention 2	BMP#5 UG Infiltration Basin 2
Receiving Stream Name	Cape Fear River	Cape Fear River	Cape Fear River	Cape Fear River	
Receiving Stream Index Number	18-(71)	18-(71)	18-(71)	18-(71)	18-(71)
Stream Classification	SC	SC	SC	SC	SC
Total Drainage Area (sf)	141,771	96,519	31,389	13,527	39,017
On-Site Drainage Area (sf)	141,771	96,519	31,389	13,527	39,017
Off-Site Drainage Area (sf)	0	0	0	0	0
Total Impervious Area (sf)	73,513	59,433	12,287	8,102	30,202
Buildings/Lots (sf)	19,245	28,104	0	0	0
Impervious Pavement (sf)	26,199	16,693	11,789	3,396	27,519
Pervious Pavement (sf) (adj. total, with 100% credit applied)	0	0	0	0	0
Impervious Sidewalks (sf)	7,475	12,386	498	797	2,683
Pervious Sidewalks (sf)	0	0	0	0	0
Other (sf)	0	0	0	0	0
Future Development (sf)	20,594	2,250	0	3,909	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 Pervious Concrete 1	BMP#7 Pervious Concrete 2	BMP#8 Pervious Concrete 3		
Receiving Stream Name		Cape Fear River			
Receiving Stream Index Number	18-(71)	18-(71)	18-(71)		
Stream Classification	SC	SC	SC		
Total Drainage Area (sf)	1,279	2,954	2,808		
On-Site Drainage Area (sf)	1,279	2,954	2,808		
Off-Site Drainage Area (sf)	0	0	0		
Total Impervious Area (sf)	309	723	646		
Buildings/Lots (sf)					
Impervious Pavement (sf)					
Pervious Pavement Footprint (sf)	1,106	2,194	1,997		
Pervious Pavement (sf) (adj. total, with 100% credit applied)	0	0	0		
Impervious Sidewalks (sf)	309	723	646		
Pervious Sidewalks (sf)					
Other (sf)					
Future Development (sf)					
Existing Impervious to remain (sf)					
Offsite (sf)					
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 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.

SEAL

MANDANA ANDERSON-ILLE
NOTARY PUBLIC
NEW HANOVER COUNTY, NC

Signature: _____

Date: 1-18-19

I, Mandana Anderson-Ille, 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 January 18, 2019, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

_____

My commission expires: June 8, 2019

Permit Number:_____
(to be provided by DWQ)

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	
In-situ soil:			
Soil permeability	12.00	in/hr	OK
Planting media soil:			
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 localed 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			

Permit Number:_____
(to be provided by DWQ)

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 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
Planting media soil:			
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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MAY 18 2017
ENGINEERING

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 localed 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		

Permit No._____
(to be provided by DWQ)

NCDENR

DIVISION OF WATER QUALITY DWQ

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

WET DETENTION BASIN SUPPLEMENT

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

I. PROJECT INFORMATION

Project name	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	

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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	OK

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(to be provided by DWQ)

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_o)	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.
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.		

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

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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

INFILTRATION TRENCH 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 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	7,268.00	ft^3	
Volume provided	20,695.00	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	0.25	days	OK
Perforated pipe diameter	Cultec 330XLHD	in	
Perforated pipe length	156.00	ft	
Number of laterals	10		
Stone type (if used)	1-2 inch		
Stone void ratio	0.4		
Stone is free of fines?	Y	(Y or N)	OK

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Trench Elevations			
Bottom elevation	46.00	fmsl	OK
Storage/overflow elevation	49.50	fmsl	
Top elevation	50.04	fmsl	
Trench Dimensions			
Length (long dimension)	317.00	ft	
Width (short dimension)	100.00	ft	
Height (depth)	4.04	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	3		OK
Distance to structure	15.00	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 occuring 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
Capures 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?	Y	(Y or N)	OK
Pretreatment device provided	Catch Basin Sumps		

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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

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	9,914.00	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	42.33	fmsl	
Trench Design Parameters			
Drawdown time	0.26	days	OK
Perforated pipe diameter	Cultec 902HD	in	
Perforated pipe length	237.00	ft	
Number of laterals	2		
Stone type (if used)	1-2 inch		
Stone void ratio	0.4		
Stone is free of fines?	Y	(Y or N)	OK

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Trench Elevations			
Bottom elevation	44.41	fmsl	OK
Storage/overflow elevation	48.50	fmsl	
Top elevation	50.41	fmsl	
Trench Dimensions			
Length (long dimension)	237.00	ft	
Width (short dimension)	14.00	ft	
Height (depth)	6.00	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	4		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 occuring 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
Capures 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?	Y	(Y or N)	OK
Pretreatment device provided	Catch Basin Sumps		

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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

PERMEABLE PAVEMENT SUPPLEMENT

This form must be completely filled out, printed and submitted.
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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

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

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~~ 0 Rac	ft^2	Rac
Adjacent BUA directed to PP (A_c)	309	ft^2	OK
Ratio of A_c to A_p	0.28	(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	53.66	fmsl	
Storage elevation of design rainfall depth	53.08	fmsl	
Overflow elevation	54.16	fmsl	
Bottom elevation at subgrade	52.66	fmsl	#REF!
SHWT elevation	42.33	fmsl	
Underdrain diameter	NA	in	

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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~~ flac
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
Washed stone is specified for the aggregate?	Yes		OK
Required signage specified on plans?	No		~~Signage must be specified on the plans~~ flac
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

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III. REQUIRED ITEMS CHECKLIST	

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	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 infiltation 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

Permit No._____
(to be provided by DWQ)

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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

PERMEABLE PAVEMENT SUPPLEMENT

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

I. PROJECT INFORMATION

Project Name	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

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

Permeable Pavement (PP) design type	Infiltration - HSG A/B		
SA of PP being proposed (A_p)	2,194	ft^2	Rac
Resulting BUA counted as impervious for main application form	~~545~~ 0	ft^2	Rac
Adjacent BUA directed to PP (A_c)	723	ft^2	OK
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	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	52.45	fmsl	
Storage elevation of design rainfall depth	51.87	fmsl	
Overflow elevation	52.95	fmsl	
Bottom elevation at subgrade	51.45	fmsl	#REF!
SHWT elevation	42.33	fmsl	
Underdrain diameter	NA	in	

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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~~
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
Washed stone is specified for the aggregate?	Yes		OK
Required signage specified on plans?	No		~~Signage must be specified on the plans~~
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

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III. REQUIRED ITEMS CHECKLIST	

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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 infiltation 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.)	_____	Infilration 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

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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

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

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	flac
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	#REF!
SHWT elevation	42.33	fmsl	
Underdrain diameter	NA	in	

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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, borms, or terracing.~~ Rac
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
Washed stone is specified for the aggregate?	Yes		OK
Required signage specified on plans?	No		~~Signage must be specified on the plans~~ Rac
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

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	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 infiltation 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.)	_____	Infilration 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

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

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.

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 much 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
NOTARY PUBLIC
NEW HANOVER COUNTY, NC

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.

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 monculture of plants must be avoided)	Remove all invasives by physical removal or by wiping them with pesticide (do not spray) - consult a professional.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.

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

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

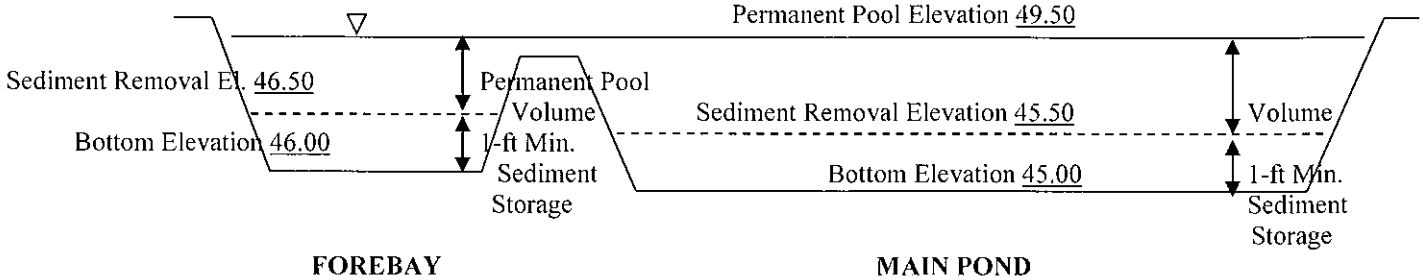
The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

When the permanent pool depth reads _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 [redacted])
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:

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,

LALE K OZEN NOTARY PUBLIC NEW HANOVER COUNTY, NC

SEAL

My commission expires 6/12/19

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

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.

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

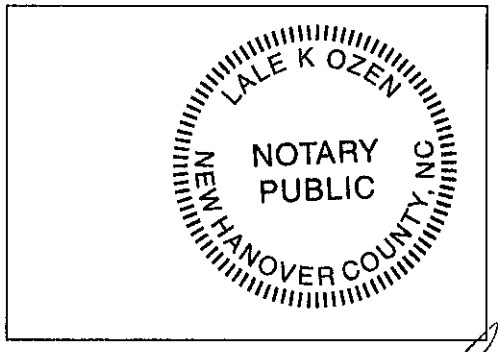
Phone:910 254-5434

Signature: 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 6/12/19

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

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.

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,

LALE K OZEN
NOTARY PUBLIC
NEW HANOVER COUNTY, NC

SEAL

Lale K. Ozen

My commission expires 6/12/17

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

Permeable Pavement Operation and Maintenance Agreement

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

Important operation and maintenance procedures:

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

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

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.

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 ~~DWQ~~ 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 ~~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 or lot number: BMP #6, BMP #7, BMP #8

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 permeable pavement maintenance requirements. Witness my hand and official seal,

SEAL
LALE K OZEN
NOTARY PUBLIC
NEW HANOVER COUNTY, NC

My commission expires 6/12/19

CURVE TABLE

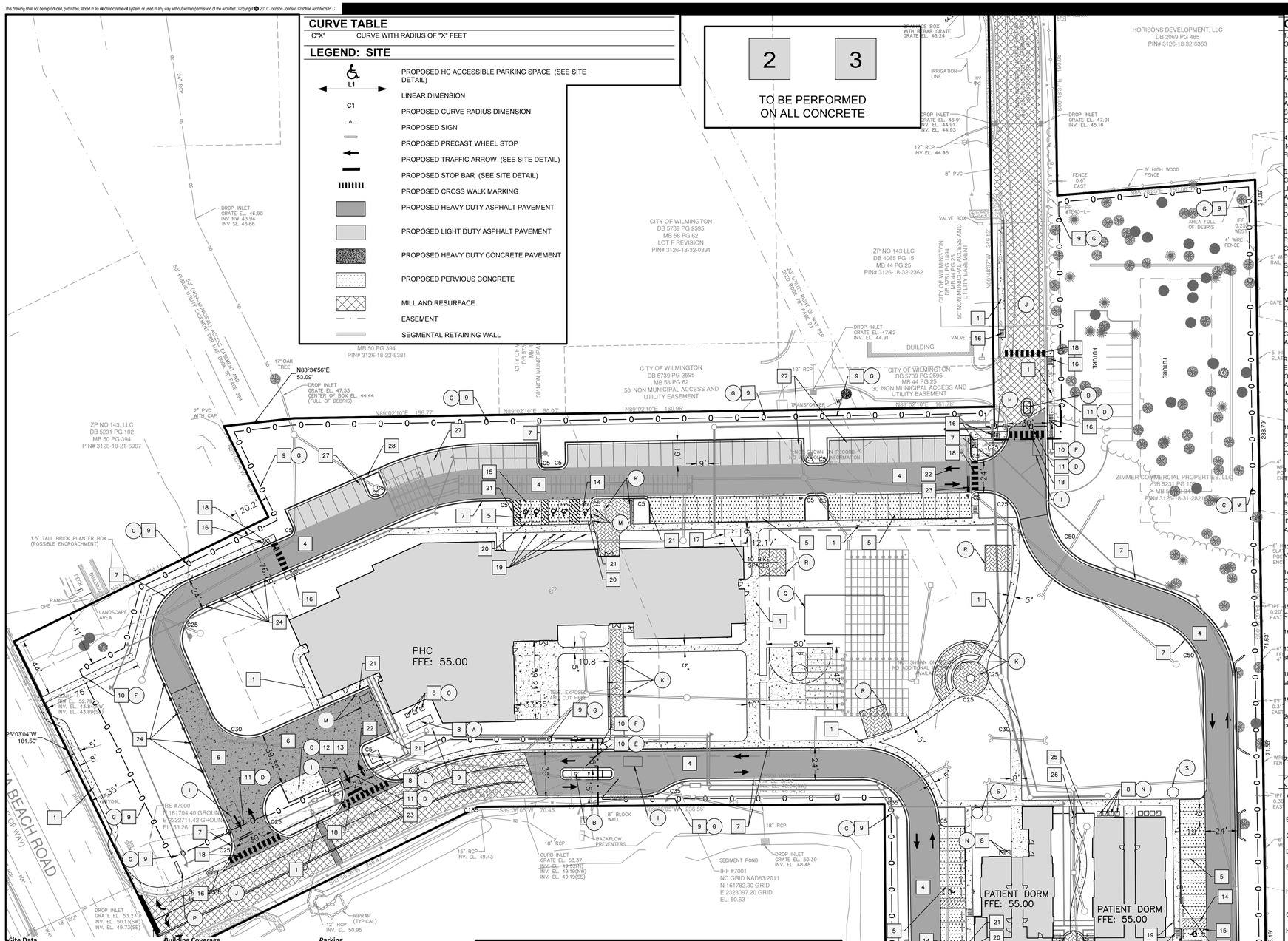
C"X" CURVE WITH RADIUS OF "X" FEET

LEGEND: SITE

- PROPOSED HC ACCESSIBLE PARKING SPACE (SEE SITE DETAIL)
- L1 — LINEAR DIMENSION
- C1 — PROPOSED CURVE RADIUS DIMENSION
- PROPOSED SIGN
- PROPOSED PRECAST WHEEL STOP
- PROPOSED TRAFFIC ARROW (SEE SITE DETAIL)
- PROPOSED STOP BAR (SEE SITE DETAIL)
- PROPOSED CROSS WALK MARKING
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED LIGHT DUTY ASPHALT PAVEMENT
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED PERVIOUS CONCRETE
- MILL AND RESURFACE
- EASEMENT
- SEGMENTAL RETAINING WALL

2 3

TO BE PERFORMED ON ALL CONCRETE



GENERAL SITE NOTES

1. SITE LAYOUT FOR WILMINGTON TREATMENT CENTER SITE NO. 2 BY INGRAM CIVIL ENGINEERING GROUP, LLC, BASED ON SITE SURVEY BY MCKIM & CREED ON 09-28-2016.

2. ORIGINAL TOPOGRAPHICAL INFORMATION IS BASED ON A SURVEY BY MCKIM & CREED ON 09-28-2016. THE ENGINEER, THE OWNER, OR ANY OF THE OWNER'S CONSULTANTS SHALL NOT BE HELD RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION.

3. ALL CIVIL/SITE WORK ELEMENTS INDICATED TO BE CONSTRUCTED ON THE PLANS ARE TO BE BUILT IN STRICT ACCORDANCE WITH THE STANDARDS ADOPTED BY THE CITY OF WILMINGTON/NEW HANOVER COUNTY, UNLESS SPECIFICALLY NOTED OTHERWISE. ALL SITE WORK MUST ALSO COMPLY WITH THECITY OF WILMINGTON/NEW HANOVER COUNTY ENVIRONMENTAL REQUIREMENTS AND FEDERAL EPA REQUIREMENTS.

4. WRITTEN DIMENSIONS PREVAIL. DO NOT SCALE THESE DRAWINGS. PRINTED DIMENSIONS WHICH ARE OMITTED OR IN CONFLICT SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER FOR REVIEW AND RESPONSE. DIMENSIONS ARE FROM FACE OF CURB / EDGE OF PAVEMENT AND FACE OF BUILDING, UNLESS NOTED OTHERWISE.

5. DIMENSIONS LOCATING THE BUILDING IN RELATIONSHIP TO THE PROPERTY LINES HAVE BEEN PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR. WHERE POSSIBLE, COORDINATES CAN BE USED TO ESTABLISH PHYSICAL LENGTHS ALONG THE BUILDING PERIMETER. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING FROM STRUCTURAL AND ARCHITECTURAL DRAWINGS THE ACTUAL EXTENT OF THE BUILDING ON THE PROPERTY. BUILDING LAYOUT SHALL BE BASED SOLELY ON DIMENSIONAL INFORMATION PROVIDED ON STRUCTURAL AND ARCHITECTURAL DRAWINGS. DISCREPANCIES WHICH IMPACT SITE LAYOUT SHOULD BE IMMEDIATELY REPORTED TO THE ENGINEER.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL SITE FEATURES, (BUILDINGS, ROADS, PARKING, PADS, WALKS, ETC.) AND WILL EMPLOY A LAND SURVEYOR LICENSED TO PRACTICE IN THE PROJECT'S REGION OF CONSTRUCTION TO STAKE OUT AND MAINTAIN ALL REQUIRED CONTROL POINTS THROUGHOUT THE LIFE OF THE PROJECT. THE SURVEYOR SHALL CERTIFY TO THE ENGINEER, IN WRITING, THAT THE LAYOUT IN THE FIELD SUBSTANTIALLY CONFORMS TO THE LAYOUT INDICATED ON THE CONTRACT DOCUMENTS. LAYOUT DISCREPENCIES OR CHANGES SHOULD BE SO NOTED TO THE ENGINEER.

7. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR THE DAMAGE OR LOSS OF ANY REFERENCE POINTS, MONUMENTS, HUBS, AND STAKED LOT CORNERS DURING THE CONSTRUCTION OF THE WORK AND SHALL BEAR ANY COST ASSOCIATED WITH REPAIR.

8. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES, OBTAIN ALL PERMITS, AND PAY ALL PERMIT FEES. THE CONTRACTOR SHALL CONFORM TO ALL STATE AND LOCAL CODES AND ORDINANCES AND RECEIVE APPROPRIATE APPROVALS WHERE REQUIRED PRIOR TO COMMENCEMENT OF THE WORK.

9. MATERIALS AND PROCESSES OF CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. WHILE THE ENGINEER HAS PROVIDED, FOR THE CONVENIENCE OF THE CONTRACTOR, DRAWINGS OUTLINING CERTAIN REQUIRED OSHA MINIMUM SAFETY PRACTICES, THE ENGINEER DOES NOT ACCEPT RESPONSIBILITY FOR THE ACCURACY OF THE INFORMATION OR FOR VERIFYING THAT SUCH MEASURES ARE IMPLEMENTED ON SITE. MAINTAINING A SAFE ENVIRONMENT DURING THE PROMULGATION OF THE WORK IS THE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER, THE OWNER AND OTHER CONSULTANTS, HAVE NO EXPERTISE, NOR ACCEPT ANY LIABILITY, IMPLIED OR OTHERWISE, FOR MATERIALS AND PROCESSES OF CONSTRUCTION.

10. THE CONTRACTOR SHALL NOT COMMENCE ANY WORK WHICH IS NOT UNDER THE CONTROL OR OWNERSHIP OF THE OWNER WITHOUT WRITTEN PERMISSION FROM THE PROPERTY'S OWNER OR CONTROLLING INTEREST. WHERE CONTROLLING INTEREST IS A LOCAL, STATE, OR FEDERAL AGENCY, THEN APPROVAL FOR CONSTRUCTION SHALL CONSTITUTE AUTHORITY TO COMMENCE WORK.

11. WHERE NOT SPECIFICALLY NOTED OTHERWISE, ALL CONCRETE FINISHES SHALL BE SLIP RESISTANT PER ENTECHNICAL SPECIFICATIONS.

12. ALL ACCESSIBLE PARKING SPACES, INDICATED WITH THE GRAPHIC ACCESSIBLE SYMBOL, DENOTE ACCESSIBLE PARKING SPACES. THESE SPACES ARE DESIGNED TO CONFORM TO ADA AND NORTH CAROLINA ACCESSIBILITY STANDARD SPECIFICATIONS. ALL INDICATED SPACES SHALL RECEIVE THE PAINTED SYMBOL AND APPROPRIATE IDENTIFICATION SIGNAGE. WHERE REQUIREMENTS ARE DIFFERENT OR IN EXCESS OF THESE, THE CONTRACTOR WILL ALLOW FOR THOSE ADDITIONAL REQUIREMENTS IN HIS PRICE AND PROMPTLY SUBMIT THEM TO THE ENGINEER.

13. THE CONTRACTOR IS RESPONSIBLE FOR USING THE ONE-CALL SYSTEM OR OTHER MEANS TO CONTACT AND VERIFY LOCATIONS OF ALL UTILITIES. THE CONTRACTOR IS FULLY RESPONSIBLE FOR REPAIRS TO DAMAGED UTILITIES.

14. THE CONTRACTOR IS TO CONTROL TRAFFIC FLOW DURING TIME OF CONSTRUCTION. ANY AND ALL TRAFFIC CONTROL IMPLEMENTED DURING THIS PROJECT SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

15. ALL WORK WITHIN PUBLIC RIGHT-OF-WAY MUST BE IN ACCORDANCE WITH CITY OF WILMINGTON/NEW HANOVER COUNTY AND NC D.O.T. REGULATIONS.

16. All pavement markings in public right-of-ways and for driveways are to be thermoplastic and meet City and/or NCDOT standards.

17. All signs and pavement markings in areas open to public traffic are to meet MUTCD (Manual on Uniform Traffic Control Devises) standards.

18. All traffic control signs and markings off the right-of-ways are to be maintained by the property owner in accordance with MUTCD standards.

19. All parking stall markings and lane arrows within the parking areas shall be white.

20. A utility cut permit is required for each open city of a City street. Note this on the plan and contact 341-5888 for more details. In certain cases an entire resurfacing of the area being open city may be required.

21. Any broken or missing sidewalk panels, driveway panels and curbing will be replaced.

22. Contact Traffic Engineering at 341-7888 forty-eight hours prior to any excavation in the right of way.

SITE NOTES

A	20'x6' GENERATOR PAD WITH FENCE. COORDINATE FINAL SIZE AND SECTION WITH MANUFACTURER'S SPECIFICATIONS.
B	GATE KEYPAD/CARD READER IN CONCRETE ISLAND
C	COMPACTOR PAD WITH ENCLOSURE.
D	6' HIGH BY 30' WIDE AUTOMATED CANTILEVER GATE. COORDINATE WITH ELECTRICAL.
E	6' HIGH BY 15' WIDE AUTOMATED DOUBLE LEAF SWING GATE WITH 6' WIDE GAP. COORDINATE WITH ELECTRICAL.
F	6' HIGH BY 4' WIDE SINGLE LEAF ALUMI-GUARD PANEL SECURITY SWING GATE.COORDINATE WITH ELECTRICAL.
G	6' ALUMI-GUARD PANEL SECURITY FENCE.
H	6' HIGH ALUMI-GUARD PANEL SECURITY FENCE BETWEEN SWING GATE OPENING. MATCH SWING GATE STYLE.
I	SENSOR FOR GATE. COORDINATE WITH ELECTRICAL PLANS.
J	MIL 1.5" AND RESURFACE DRIVE ENTRANCES TO THE SITE.
K	SEE LANDSCAPE PLANS FOR MORE PAVER INFORMATION IN THIS AREA.
L	8'X8' TRANSFORMER PAD COORDINATE FINAL SIZE AND SECTION WITH MANUFACTURER'S SPECIFICATIONS.
M	BOLLARD. SEE ARCHITECTURAL FOR DETAIL.
N	3.5'x3.5' CONDENSER PAD. COORDINATE FINAL SIZE AND SECTION WITH MANUFACTURER'S SPECIFICATIONS.
O	3'x3' CONDENSER PAD. COORDINATE FINAL SIZE AND SECTION WITH MANUFACTURER'S SPECIFICATIONS.
P	ENTRANCE SIGN. COORDINATE WITH ARCHITECTURAL PLANS.
Q	VOLLEY BALL COURT LOCATION. OWNER WILL COORDINATE LANDSCAPE CONTRACTOR FOR INSTALLATION.
R	20'X20' EXERCISE STATION
S	GAZEBO

SITE DETAILS

1	CONCRETE SIDEWALK	15	ACCESSIBLE PARKING SPACES LAYOUT
2	CONCRETE JOINTS	16	ACCESSIBLE CURB RAMP
3	CONCRETE JOINT SEALANTS	17	BIKE RACK
4	HEAVY DUTY ASPHALT PAVEMENT	18	CROSSWALK
5	PERVIOUS CONCRETE PAVEMENT	19	ACCESSIBLE SIGN
6	HEAVY DUTY CONCRETE PAVEMENT	20	WHEEL STOP
7	CONCRETE CURB AND GUTTER	21	CURB TRANSITION (CONCRETE UP)
8	CONCRETE MECHANICAL PAD	22	TRAFFIC FLOW ARROWS
9	ALUMI-GUARD SECURITY FENCE	23	STOP BARS
10	ALUMI-GUARD SECURITY SWING GATE	24	2 FT CURB CUT
11	TRANSPORT II CANTILEVER GATE	25	4' MONTAGE PLUS MAJESTIC FENCE
12	DUMPSTER PAD WITH ENCLOSURE	26	4' MONTAGE PLUS MAJESTIC GATE
13	WOOD DUMPSTER SCREEN FENCE	27	LIGHT DUTY ASPHALT
14	ACCESSIBLE SYMBOL	28	3 FT CONCRETE FLUME

Site Data

Address: Wilmington Treatment Center
Partial Hospitalization Center
2645 & 2651 Carolina Beach Road
Wilmington, NC

Parcel ID: R06018-010-010-000
R06018-010-013-000

Owner: Acadia Heathcare
6100 Tower Circle, Suite 1000
Franklin, TN 37067

Parcel Size: 9.03 AC (393,610 SF)

Zoning: RB - Regional Business

Existing Land Use: Vacant

Proposed Land Use: Medical/Health (Hospital)

Building Data

Hospitalization Building: 37,347 GSF

Building Ht.: Varies from 22'-29'

Patient Dormatories: (2 Bldgs) 34,520 GSF Total

Building Ht: 29'

Total # Buildings: 3

Total GSF: 71,867

TYPE OF CONSTRUCTION

PHC:CONSTRUCTION TYPE II B

PATIENT DORMITORIES: CONSTRUCTION TYPE V A

Building Coverage

Total Building Coverage: 47,348 SF

Proposed Building Lot Coverage: 12%

Allowed Coverage: 40%

PERCENT IMPERVIOUS

WITHOUT PERVIOUS CREDIT: 48%

WITH PERVIOUS CREDIT: 47%

Setbacks

Front: 25 Feet

Rear: 15 Feet (b)(d)

Side: 0 Feet (c)(d)

Max Bldg Ht. 35 feet

(a) See subsection (f)(2) below for increased building height allowances to a maximum of ninety-six (96) feet.

(b) When abutting a residential district, the minimum rear setback shall be twenty-five (25) feet.

(c) When abutting a residential district, the minimum interior side setback shall be twenty (20) feet.

(d) For every foot of increased height for structures over twenty (20) feet, the developer shall provide additional interior side and rear yard setbacks at a 1:1 ratio where abutting a residential district.

CAMA Land Use Classification: Urban

Parking

REQUIRED:

HOSPITAL: 1 SPACE PER 2 BEDS + 1 SPACE PER EMPLOYEE ON MAX SHIFT

(96 BEDS / 2) + 48 EMPLOYEES = 96 SPACES

PROVIDED: 104 SPACES (97 NON-ACCESSIBLE SPACES AND 7 ACCESSIBLE SPACES)

Bicycle Parking

REQUIRED:

5 BICYCLE SPACES FOR FIRST 25 VEHICLE PARKING SPACES + 25 BICYCLE SPACES PER ADDITIONAL 100 VEHICLE SPACES.

PROVIDED: 10 SPACES

Impervious Coverage

Buildings: 47,348 SF

Drives: 82,244 SF

Pervious Parking: 5,297 SF(without pervious concrete credit)

Pervious Parking: 0 SF (with pervious concrete credit)

Walks: 27,879 SF

Future: 27,744 SF

Total: 190,512 SF (without pervious concrete credit and including 27,744 SF of future impervious)

185,215 SF (with pervious concrete credit and including 27,744 SF of future impervious)

SITE PLAN

40 0 40 80 GRAPHIC SCALE 1" = 40'

RECORD DRAWINGS

JJC A

Johnson Johnson Crabtree Architects PC
4551 Trousdale Drive Nashville, TN 37204
tel 615.837.0656
fax 615.837.0657

New Partial Hospitalization Center for:
Wilmington Treatment Center
Wilmington, NC

ACADIA HEALTHCARE

NORTH CAROLINA PROFESSIONAL SEAL 027243 ENGINEER CURTIS P INGRAM JR

INGRAM CIVIL ENGINEERING GROUP, LLC
212 Overlook Circle, Ste. 105
Brentwood, Tennessee 37027
615.370.7964 Office
615.370.1273 Fax
STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER LICENSE # 027243
CURTIS P. INGRAM

PROJECT NUMBER
15678.01

DATE
January 13, 2017

C201
SITE PLAN

For each open utility cut of City streets, a $325 permit shall be required from the City prior to occupancy and/or project acceptance.

CITY OF WILMINGTON
NORTH CAROLINA

Public Services ● Engineering Division

APPROVED STORMWATER MANAGEMENT PLAN

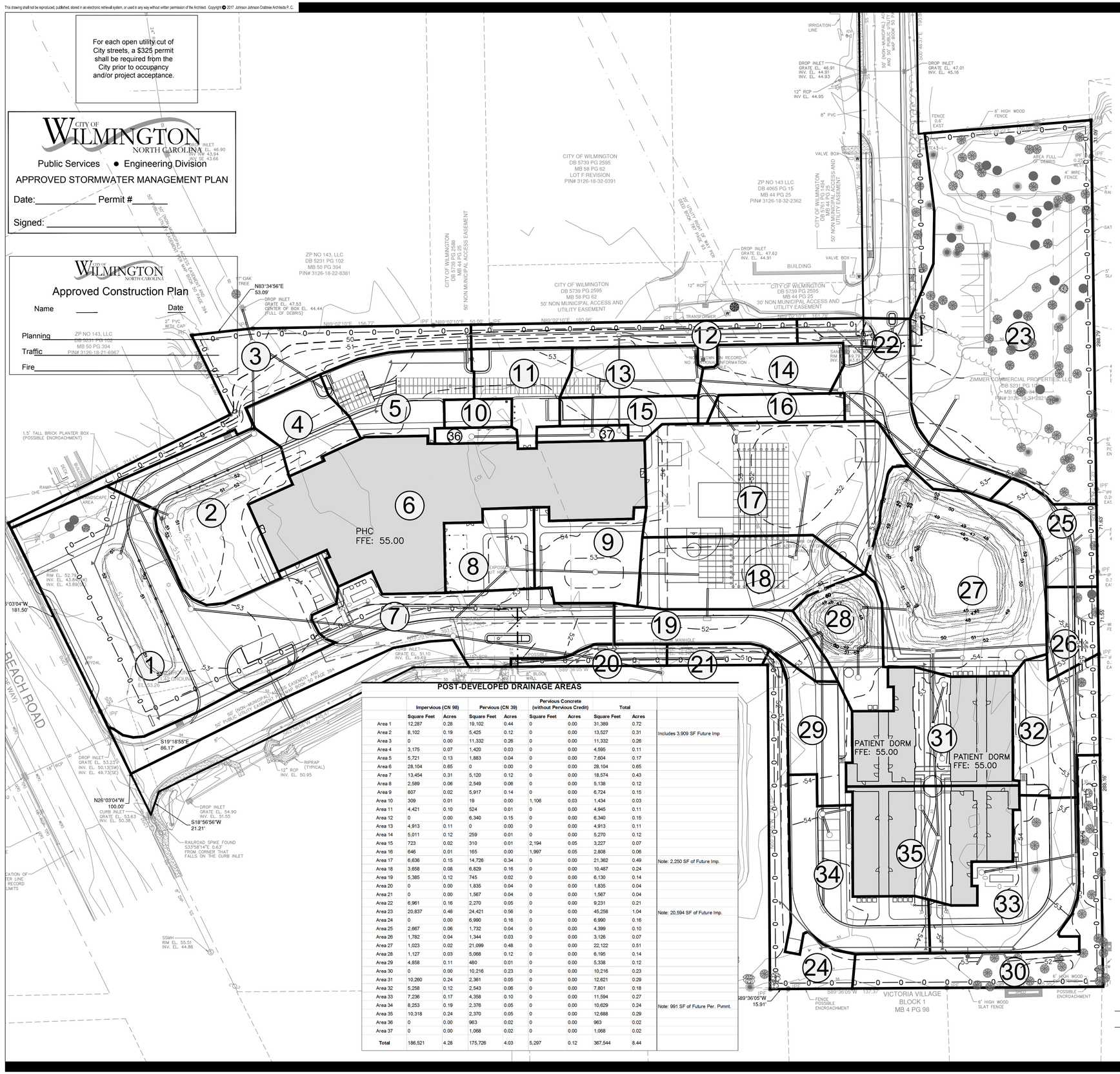
Date:_____ Permit #_____

Signed: _____

CITY OF WILMINGTON
NORTH CAROLINA

Approved Construction Plan

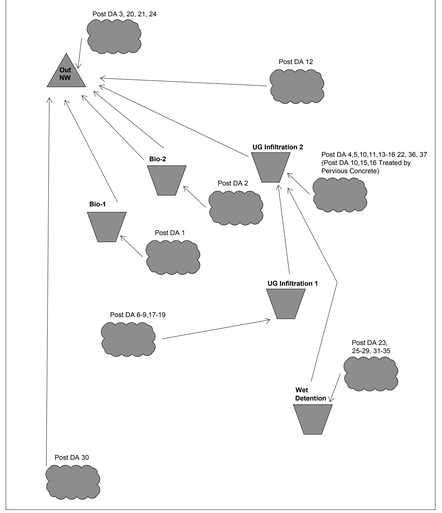
Name	Date
Planning	
Traffic	
Fire	



POST-DEVELOPED DRAINAGE AREAS

	Impervious (CN 98)		Pervious (CN 39)		Pervious Concrete (without Pervious Credit)		Total		
	Square Feet	Acres	Square Feet	Acres	Square Feet	Acres	Square Feet	Acres	
Area 1	12,287	0.28	19,102	0.44	0	0.00	31,389	0.72	
Area 2	8,102	0.19	5,425	0.12	0	0.00	13,527	0.31	Includes 3,909 SF Future Imp
Area 3	0	0.00	11,332	0.26	0	0.00	11,332	0.26	
Area 4	3,175	0.07	1,420	0.03	0	0.00	4,595	0.11	
Area 5	5,721	0.13	1,883	0.04	0	0.00	7,604	0.17	
Area 6	28,104	0.65	0	0.00	0	0.00	28,104	0.65	
Area 7	13,454	0.31	5,120	0.12	0	0.00	18,574	0.43	
Area 8	2,589	0.06	2,549	0.06	0	0.00	5,138	0.12	
Area 9	807	0.02	5,917	0.14	0	0.00	6,724	0.15	
Area 10	309	0.01	19	0.00	1,106	0.03	1,434	0.03	
Area 11	4,421	0.10	524	0.01	0	0.00	4,945	0.11	
Area 12	0	0.00	6,340	0.15	0	0.00	6,340	0.15	
Area 13	4,913	0.11	0	0.00	0	0.00	4,913	0.11	
Area 14	5,011	0.12	259	0.01	0	0.00	5,270	0.12	
Area 15	723	0.02	310	0.01	2,194	0.05	3,227	0.07	
Area 16	646	0.01	165	0.00	1,997	0.05	2,808	0.06	
Area 17	6,636	0.15	14,726	0.34	0	0.00	21,362	0.49	Note: 2,250 SF of Future Imp.
Area 18	3,658	0.08	6,829	0.16	0	0.00	10,487	0.24	
Area 19	5,385	0.12	745	0.02	0	0.00	6,130	0.14	
Area 20	0	0.00	1,835	0.04	0	0.00	1,835	0.04	
Area 21	0	0.00	1,567	0.04	0	0.00	1,567	0.04	
Area 22	6,961	0.16	2,270	0.05	0	0.00	9,231	0.21	
Area 23	20,837	0.48	24,421	0.56	0	0.00	45,258	1.04	Note: 20,594 SF of Future Imp.
Area 24	0	0.00	6,990	0.16	0	0.00	6,990	0.16	
Area 25	2,667	0.06	1,732	0.04	0	0.00	4,399	0.10	
Area 26	1,782	0.04	1,344	0.03	0	0.00	3,126	0.07	
Area 27	1,023	0.02	21,099	0.48	0	0.00	22,122	0.51	
Area 28	1,127	0.03	5,068	0.12	0	0.00	6,195	0.14	
Area 29	4,858	0.11	480	0.01	0	0.00	5,338	0.12	
Area 30	0	0.00	10,216	0.23	0	0.00	10,216	0.23	
Area 31	10,260	0.24	2,361	0.05	0	0.00	12,621	0.29	
Area 32	5,258	0.12	2,543	0.06	0	0.00	7,801	0.18	
Area 33	7,236	0.17	4,358	0.10	0	0.00	11,594	0.27	
Area 34	8,253	0.19	2,376	0.05	0	0.00	10,629	0.24	Note: 991 SF of Future Per. Pvmnt.
Area 35	10,318	0.24	2,370	0.05	0	0.00	12,688	0.29	
Area 36	0	0.00	963	0.02	0	0.00	963	0.02	
Area 37	0	0.00	1,068	0.02	0	0.00	1,068	0.02	
Total	186,521	4.28	175,726	4.03	5,297	0.12	367,544	8.44	

POST-DEVELOPED SUB BASIN ROUTING EXHIBIT



POST-DEVELOPED DRAINAGE MAP

GRAPHIC SCALE 40 0 40 80 1" = 40'

RECORD DRAWINGS

JJC A

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INGRAM CIVIL ENGINEERING GROUP, LLC
212 OVERLOOK CIRCLE, STE. 105
BRENTWOOD, TENNESSEE 37027
615.370.7964 OFFICE
615.370.1273 FAX
STATE OF NORTH CAROLINA
PROFESSIONAL ENGINEER
LICENSE # 027243
CURTIS P. INGRAM

PROJECT NUMBER
15678.01
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January 13, 2017

C401
POST-DEVELOPED DRAINAGE MAP