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

October 7, 2020

Mr. Mark Resier
Reiser Partners, LLC
2029 Eastwood Road, #143
Wilmington, NC 28403

Subject: Stormwater Management Permit No. 2018050R1
Jordan Lane Duplexes
High Density Development

Dear Mr. Reiser:

The City of Wilmington Engineering Division has received a request for a revision to the Stormwater Management Permit for Jordan Lane Duplexes. 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:

- Due to the site not having an appropriate outfall, the infiltration basin was required to infiltrate the 100-year storm event. This permit revision captures this design change. Impervious surface areas were not affected. The emergency overflow and private drainage easement were removed from the originally approved plan set. See approved plans dated October 6, 2020.

Please be aware all terms and conditions of the permit Issued on November 27, 2018 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,

Richard Christensen

for Sterling Cheatham, City Manager
City of Wilmington

cc: Charles D. Cazier, PE, Intracoastal Engineering, PLLC
Jeff Walton, Associate Planner, City of Wilmington

CITY OF WILMINGTON
NORTH CAROLINA

* unless noted otherwise

Public Services
Engineering
414 Chestnut St, Suite 200
Wilmington, NC 28401
910 341-7807
910 341-5881 fax
wilmingtonnc.gov
Dial 711 TTY/Voice

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
(Form SWP 2.2)

I. GENERAL INFORMATION

1. Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):

   Jordan Ln. Duplexes

2. Location of Project (street address):

   210 Jordan Ln.

   City: Wilmington County: New Hanover Zip: 28403

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

   Site is located on the East side of Jordan Ln. approx. 475' North from the intersection of Jordan Ln. and Wrightsville Ave.

II. PERMIT INFORMATION

1. Specify the type of project (check one): ☐ Low Density ☒ High Density
   ☐ Drains to an Offsite Stormwater System ☐ Drainage Plan ☐ Other
   If the project drains to an Offsite System, list the Stormwater Permit Number(s):

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

2. Is the project currently covered (whole or in part) by an existing City or State (NCDENR/DWQ) Stormwater Permit? ☐ Yes ☒ No
   If yes, list all applicable Stormwater Permit Numbers:

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

3. Additional Project Permit Requirements (check all applicable):
   ☐ CAMA Major ☒ Sedimentation/Erosion Control
   ☐ NPDES Industrial Stormwater ☐ 404/401 Permit: Proposed Impacts: _____
   If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit:

   NA

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: Reiser Partners, LLC

   Signing Official & Title: Mark Reiser, Member Manager

   a. Contact information for Applicant / Signing Official:

   Street Address: 2029 Eastwood Rd. #143

   City: Wilmington State: NC Zip: 28403

   Phone: 910-352-6110 Fax: _____ Email: mcreiser@aol.com

   Mailing Address (if different than physical address): _____

   City: _____ State: _____ Zip: _____

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

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

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

   Property Owner / Organization: NA

   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: NA

   Signing Official & Title: _____

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

Street Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____ Email: _____

Mailing Address (if different than physical address): _____

City: _____ State: _____ Zip: _____

IV. PROJECT INFORMATION

1. In the space provided below, briefly summarize how the stormwater runoff will be treated.
   Runoff will be treated via an on-site open infiltration basin.
   Infiltration basin will be sized to treat the 1.5" and 25 year Pre-Post Storm.
2. Total Property Area: 56,295 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: 56,295 square feet.
6. Existing Impervious Surface within Property Area: 0 square feet
7. Existing Impervious Surface to be Removed/Demolished: 0 square feet
8. Existing Impervious Surface to Remain: 0 square feet
9. Total Onsite (within property boundary) Newly Constructed Impervious Surface (*in square feet*):

Buildings/Lots	8,640
Impervious Pavement	6,972
Pervious Pavement (adj. total, with 100 % credit applied)	0
Impervious Sidewalks	1,522
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe)	0
Future Development	2,000
Total Onsite Newly Constructed Impervious Surface	19,134

10. Total Onsite Impervious Surface
    (Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 19,134 square feet
11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 34 %

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

13. Total Newly Constructed Impervious Surface
(Total Onsite + Offsite Newly Constructed Impervious Surface) = 19134 square feet

14. Complete the following information for each Stormwater BMP drainage area. If there are more than three drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below. Low Density projects may omit this section and skip to Section V.

Basin Information	Existing Area BMP # 1	BMP # PP1	BMP # PP2
Receiving Stream Name	Bradley Creek	Bradley Creek	Bradley Creek
Receiving Stream Index Number	18-87-24-4-(1)	18-87-24-4-(1)	18-87-24-4-(1)
Stream Classification	SC;HQW	SC;HQW	SC;HQW
Total Drainage Area (sf)	51095	3896	1124
On-Site Drainage Area (sf)	51095	3896	1124
Off-Site Drainage Area (sf)	0	0	0
Total Impervious Area (sf)	19134	896	333
Buildings/Lots (sf)	8640	0	0
Impervious Pavement (sf)	6972	0	0
Pervious Pavement, % credit (sf)	0	0	0
Impervious Sidewalks (sf)	1522	896	333
Pervious Sidewalks, % credit (sf)	0	0	0
Other (sf)	0	0	0
Future Development (sf)	2000	0	0
Existing Impervious to remain (sf)	0	0	0
Offsite (sf)	0	0	0
Percent Impervious Area (%)	37.4%	23.0%	29.6%

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

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

CITY OF WILMINGTON ENGINEERING

VI. CONSULTANT INFORMATION AND AUTHORIZATION

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

   Consulting Engineer: Charles D. Cazier, P.E.

   Consulting Firm: Intracoastal Engineering, PLLC

   a. Contact information for consultant listed above:

   Mailing Address: 5725 Oleander Dr. Unit E-7

   City: Wilmington State: NC Zip: 28403

   Phone: 910-859-8983 Fax: _____ Email: charlie@intracoastalengineering.com

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

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

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

Signature: _____ Date: _____

SEAL

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)* , Mark Reiser certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed restrictions and protective covenants will be recorded, and that the proposed project complies with the requirements of the applicable stormwater rules under.

Signature: _____ Date: 4/3/18

SEAL

KELLY MCCALLION
Notary Public - North Carolina
New Hanover County
My Commission Expires Nov 6, 2021

I, Kelly McCallion, a Notary Public for the State of North Carolina, County of New Hanover do hereby certify that Mark Reiser personally appeared before me this day of ~~Mar~~ KM April 3, 2018, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

Kelly McCallion

My commission expires: Nov. 6, 2021

Permit No._____
(to be provided by DWQ)

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

INFILTRATION BASIN SUPPLEMENT

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

I. PROJECT INFORMATION

Project Name	Jordan Ln. Duplexes
Contact Person	Charles Cazier
Phone Number	910-859-8983
Date	11/7/2018
Drainage Area Number	1

II. DESIGN INFORMATION

Site Characteristics			
Drainage area	51,095.00	ft^2	
Impervious area	19,134.00	ft^2	
Percent impervious	0.37	%	
Design rainfall depth	1.50	in	
Peak Flow Calculations			
1-yr, 24-hr rainfall depth		in	
1-yr, 24-hr intensity		in/hr	
Pre-development 1-yr, 24-hr discharge		ft^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 design volume required	2,472.00	ft^3	
Design volume provided	18,021.00	ft^3	OK for non-SA waters
Storage Volume: SA Waters			
1.5" runoff volume		ft^3	
Pre-development 1-yr, 24-hr runoff volume		ft^3	
Post-development 1-yr, 24-hr runoff volume		ft^3	
Minimum required volume		ft^3	
Volume provided		ft^3	
Soils Report Summary			
Soil type	SP		
Infiltration rate	5.84	in/hr	
SHWT elevation	31.00	fmsl	
Basin Design Parameters			
Drawdown time	0.87	days	OK
Basin side slopes	3.00	:1	OK
Basin bottom elevation	33.25	fmsl	OK
Storage elevation	36.25	fmsl	
Storage Surface Area	8,438.00	ft^2	
Top elevation	36.75	fmsl	
Basin Bottom Dimensions			
Basin length	245.00	ft	
Basin width	18.45	ft	
Bottom Surface Area	3,576.00	ft^2	

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Permit No._____
(to be provided by DWQ)

Additional Information

Maximum runoff to each inlet to the basin?	1.17	ac-in	OK
Length of vegetative filter for overflow	N/A	ft	OK
Distance to structure	40.00	ft	OK
Distance from surface waters	8,000.00	ft	OK
Distance from water supply well(s)	N/A	ft	OK
Separation from impervious soil layer	N/A	ft	OK
Naturally occuring soil above shwt	5.00	ft	OK
Bottom covered with 4-in of clean sand?	Y	(Y or N)	OK
Proposed drainage easement provided?	Y	(Y or N)	OK
Capures all runoff at ultimate build-out?	Y	(Y or N)	OK
Bypass provided for larger storms?	Y	(Y or N)	OK
Pretreatment device provided	NO		

SUPPLEMENT-EZ FORM COVER PAGE

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

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

Project Name:

Jordan Ln. Duplexes

Address

210 Jordan Ln.

City / Town

Wilmington

Designer information for this project:

Name and Title:	Charles Cazier Professional Engineer
Organization:	Intracoastal Engineering PLLC.
Street address:	5725 Oleander Dr. Unit E-7
City, State, Zip:	Wilmington, NC 28403
Phone number(s):	910-859-8983
Email:	Charlie@intracoastalengineering.com

Applicant:

Company:	Reiser Partners, LLC
Contact:	Mark Reiser
Mailing Address:	2029 Eastwood Rd. #143
City, State, Zip:	Wilmington, NC 28403
Phone number(s):	910-352-6110
Email:	mcreiser@aol.com

Designer

NORTH CAROLINA PROFESSIONAL SEAL 032555 ENGINEER CHARLES D. CAZIER

Seal

Signature of Designer

11/5/18

Date

Certification Statement:

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

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

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

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

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NOV 6 2018

ENGINEERING

PERMEABLE PAVEMENT

Jordan Ln. Duplexes

THE DRAINAGE AREA			1
Drainage area number	1	**Break down of BUA in the drainage area (both new and existing):**	
Total coastal wetlands area (sq ft)		- Parking / driveway (sq ft)	
Total surface water area (sq ft)		- Sidewalk (sq ft)	896 sf
Total drainage area (sq ft)	3896 sf	- Roof (sq ft)	
BUA associated with existing development (sq ft)		- Roadway (sq ft)	
Proposed new BUA (sq ft)	896 sf	- Other, please specify in the comment box below (sq ft)	
Percent BUA of drainage area	23%	**Total BUA (sq ft)**	896 sf

COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM			
Stormwater program(s) that apply (please specify):		Design rainfall depth (in)	1.5 in
Coastal Stormwater rules		Minimum volume required (cu ft)	25.35 cf
		Design volume of SCM (cu ft)	600 cf

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

PERMEABLE PAVEMENT MDC FROM 02H .1055			
#1 Was the soil investigated in the footprint and at the elevation of the infiltration system?	No	#6 How will the pavement surface be tested?	
#1 Briefly describe the hydraulic properties and characteristics of the soil profile:		NCSU Simple Infiltration Test or other appropriate test deemed suitable by the engineer.	
See Soils report		#7 Area of permeable pavement to be installed (square feet)	3000 sf
		#7 Area of screened roof runoff that is directed to pavement (square feet)	
#2 SHWT elevation (fmsl)	31.0 ft	#7 Area of additional built-upon area runoff that is directed to pavement (square feet)	896 sf
#2 Top of the subgrade (fmsl)	36 ft	#7 Will runoff from pervious surfaces be directed away from the pavement?	Yes
#2 Storage elevation of the design rainfall depth (fmsl)	36.02 ft	#8 Dewatering time (hours)	1.7 hrs
#2 Is a detailed hydrogeologic study attached if the separation is between 1 and 2 feet?	No	#8 Is additional media being added to the soil profile?	No
#3 Will toxic pollutants be stored or handled on or near the permeable pavement?	No	#9 Is at least one observation well per terrace been provided at the low point(s)?	Yes
#4 Proposed slope of the subgrade surface (%)	1%	#10 Is this a detention permeable pavement system?	No
#4 Are terraces or baffles provided?	No	#10 If so, what is the drawdown time for the design storm?	
#5 Size of aggregate to be used in the subbase	#57	#11 Have edge restraints been provided?	Yes
#5 Aggregate depth (in)	6 in	#12 Will the subgrade be graded when dry?	Yes
#5 Aggegate porosity (n)	0.4	#13 Will the permeable pavment be protected from sediment during construction?	Yes
#5 Will the aggregate be washed?	Yes	#13 Will an in-situ permeability test be conducted after site stabilization	Yes

ADDITIONAL INFORMATION
Please use this space to provide any additional information about this permeable pavement design that you think is relevant to the review:

PERMEABLE PAVEMENT

Jordan Ln. Duplexes

THE DRAINAGE AREA			2
Drainage area number	2	**Break down of BUA in the drainage area (both new and existing):**	
Total coastal wetlands area (sq ft)		- Parking / driveway (sq ft)	
Total surface water area (sq ft)		- Sidewalk (sq ft)	333 sf
Total drainage area (sq ft)	1124 sf	- Roof (sq ft)	
BUA associated with existing development (sq ft)		- Roadway (sq ft)	
Proposed new BUA (sq ft)	333 sf	- Other, please specify in the comment box below (sq ft)	
Percent BUA of drainage area	30%	**Total BUA (sq ft)**	333 sf
COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM			
Stormwater program(s) that apply (please specify):		Design rainfall depth (in)	1.5 in
		Minimum volume required (cu ft)	7.4 cf
		Design volume of SCM (cu ft)	158 cf
GENERAL MDC FROM 02H .1050			
#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the mainetenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?		#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	Yes
PERMEABLE PAVEMENT MDC FROM 02H .1055			
#1 Was the soil investigated in the footprint and at the elevation of the infiltration system?	No	#6 How will the pavement surface be tested?	
#1 Briefly describe the hydraulic properties and characteristics of the soil profile:		NCSU Simple Infiltration Test or other appropriate test deemed suitable by the engineer.	
See Soils report		#7 Area of permeable pavement to be installed (square feet)	791 sf
		#7 Area of screened roof runoff that is directed to pavement (square feet)	
#2 SHWT elevation (fmsl)	31.0 ft	#7 Area of additional built-upon area runoff that is directed to pavement (square feet)	333 sf
#2 Top of the subgrade (fmsl)	36 ft	#7 Will runoff from pervious surfaces be directed away from the pavement?	Yes
#2 Storage elevation of the design rainfall depth (fmsl)	36 ft	#8 Dewatering time (hours)	1.8 hrs
#2 Is a detailed hydrogeologic study attached if the separation is between 1 and 2 feet?	No	#8 Is additional media being added to the soil profile?	No
#3 Will toxic pollutants be stored or handled on or near the permeable pavement?	No	#9 Is at least one observation well per terrace been provided at the low point(s)?	Yes
#4 Proposed slope of the subgrade surface (%)	1%	#10 Is this a detention permeable pavement system?	No
#4 Are terraces or baffles provided?	No	#10 If so, what is the drawdown time for the design storm?	
#5 Size of aggregate to be used in the subbase	#57	#11 Have edge restraints been provided?	Yes
#5 Aggregate depth (in)	6 in	#12 Will the subgrade be graded when dry?	Yes
#5 Aggegate porosity (n)	0.4	#13 Will the permeable pavment be protected from sediment during construction?	Yes
#5 Will the aggregate be washed?	Yes	#13 Will an in-situ permeability test be conducted after site stabilization	Yes
ADDITIONAL INFORMATION			
Please use this space to provide any additional information about this permeable pavement design that you think is relevant to the review:			

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

Infiltration Basin Operation and Maintenance Agreement

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

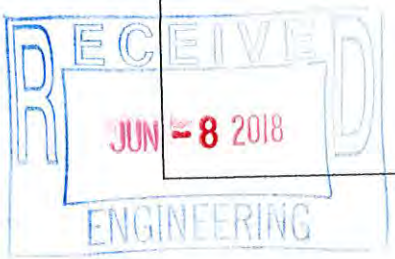
Important maintenance procedures:

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

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

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

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



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

BMP drainage basin number:1

Print name:Mark Reiser (Reiser Partners, LLC)

Title:Member/Manager

Address:2029 Eastwood Rd. #143

Phone:910-352-6110

Signature:

Date:5/21/18

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, Kelly McCallion, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Mark Reiser personally appeared before me this 21 day of May, 2018, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,

Kelly McCallion

KELLY MCCALLION
Notary Public - North Carolina
New Hanover County
My Commission Expires Nov 6, 2021

SEAL

My commission expires Nov. 6, 2021

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 City of Wilmington)

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

Project name:Jordan Ln. Duplexes

BMP drainage area or lot number: #1

Print name:Mark Reiser (Reiser Partners, LLC)

Title:Member/Manager

Address:2029 Eastwood Rd. #143

Phone:910-352-6110

Signature:

Date: 5/21/18

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, Kelly McCallion, a Notary Public for the State of North Carolina, County of New Hanover, do hereby certify that Mark Reiser personally appeared before me this 21 day of May, 2018, and acknowledge the due execution of the forgoing permeable pavement maintenance requirements. Witness my hand and official seal,

Kelly McCallion

SEAL

KELLY MCCALLION
Notary Public - North Carolina
New Hanover County
My Commission Expires Nov 6, 2021

My commission expires Nov. 6, 2021