

COMPREHENSIVE STORMWATER MANAGEMENT PERMIT

HIGH DENSITY DEVELOPMENT

SECTION 1 – APPROVAL

Having reviewed the application and all supporting materials, the City of Wilmington has determined that the application is complete and the proposed development meets the requirements of the City of Wilmington's Comprehensive Stormwater Ordinance.

PERMIT HOLDER: **NNP IV - Cape Fear River, LLC**
PROJECT: **Riverlights - Single Family Phase 5 - 6**
ADDRESS: **4410 River Road**
PERMIT #: **2021034**
DATE: **8/19/2021**

Therefore, the above referenced site is hereby approved and subject to all conditions set forth in Section 2 of this approval and all applicable provisions of the City of Wilmington Comprehensive Stormwater Management Ordinance.

This permit shall be effective from the date of issuance until 8/19/2031 and shall be subject to the following specified conditions and limitations:

Section 2 - CONDITIONS

1. This approval is valid only for the stormwater management system as proposed on the approved stormwater management plans dated 07/26/2021.
2. The project will be limited to the amount and type of built-upon area indicated in Section IV of the Stormwater Management Application Form submitted as part of the approved stormwater permit application package, and per the approved plans.
3. This permit shall become void unless the facilities are constructed in accordance with the approved stormwater management plans, specifications and supporting documentation, including information provided in the application and supplements.
4. The runoff from all built-upon area within any permitted drainage area must be directed into the permitted stormwater control system for that drainage area.
5. The permittee shall submit a revised stormwater management application packet to the City of Wilmington and shall have received approval prior to construction, for any modification to the approved plans, including, but not limited to, those listed below:
 - a. Any revision to any item shown on the approved plans, including the stormwater management measures, built-upon area, details, etc.
 - b. Redesign or addition to the approved amount of built-upon area or to the drainage area.
 - c. Further subdivision, acquisition, lease or sale of any part of the project area.
 - d. Filling in, altering, or piping of any vegetative conveyance shown on the approved plan.
 - e. Construction of any permitted future areas shown on the approved plans.



Public Services

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

6. A copy of the approved plans and specifications shall be maintained on file by the Permittee.
7. During construction, erosion shall be kept to a minimum and any eroded areas of the system will be repaired immediately.
8. If the stormwater system was used as an Erosion Control device, it must be restored to design condition prior to operation as a stormwater treatment device, and prior to issuance of any certificate of occupancy for the project.
9. All areas must be maintained in a permanently stabilized condition. If vegetated, permanent seeding requirements must follow the guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual unless an alternative is specified and approved by the City of Wilmington.
10. All applicable operation & maintenance agreements and easements pertaining to each stormwater treatment system shall be referenced on the final plat and recorded with the Register of Deeds upon final plat approval. If no plat is recorded for the site the operation and maintenance agreements and easements shall be recorded with the Register of Deeds so as to appear in the chain of title of all subsequent purchasers under generally accepted searching standards.
11. The stormwater management system shall be constructed in its entirety, vegetated and operational for its intended use prior to the construction of any built-upon surface unless prior approval is obtained. City Staff must be notified of any deviation prior to construction of the built-upon surface. Any deviation request shall include justification and must propose an alternative timeline or construction sequence. Notification shall not constitute approval. Any alternative timeline approved by City staff shall become an enforceable component of this permit.
12. The permittee shall at all times provide the operation and maintenance necessary to assure the permitted stormwater system functions at optimum efficiency. The approved Operation and Maintenance Agreement must be followed in its entirety and maintenance must occur at the scheduled intervals including, but not limited to:
 - a. Scheduled inspections (interval noted on the agreement).
 - b. Sediment removal.
 - c. Mowing and revegetation of slopes and the vegetated areas.
 - d. Maintenance of landscape plants, including those within the landscape buffer and on the vegetated shelf.
 - e. Immediate repair of eroded areas, especially slopes.
 - f. Debris removal and unclogging of outlet structure, orifice device, flow spreader, catch basins and/or piping.
 - g. Access to the outlet structure must be available at all times.
13. Records of inspection, maintenance and repair for the permitted stormwater system must be kept by the permittee for at least 5 years from the date of record and made available upon request to authorized personnel of the City of Wilmington. The records will indicate the date, activity, name of person performing the work and what actions were taken.



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14. Upon completion of construction, before a Certificate of Occupancy shall be granted, and prior to operation or intended use of this permitted facility, the applicant shall submit to the City of Wilmington as-built plans for all stormwater management facilities. The plans shall show the final design specifications and the field location, type, depth, invert and planted vegetation of all measures, controls and devices, as-installed. A certification shall be submitted, along with all supporting documentation that specifies, under seal that the as-built stormwater measures, controls and devices are in compliance with the approved stormwater management plans. A final inspection by City of Wilmington personnel will be required prior to issuance of a certificate of occupancy or operation of the permitted facility.
15. This permit is not transferable except after application and approval by the City of Wilmington. In the event of a change of ownership, name change or change of address the permittee must submit a completed Name/Ownership Change form to the City of Wilmington at least 30 days prior to the change. It shall be signed by all applicable parties, and be accompanied by all required supporting documentation. Submittal of a complete application shall not be construed as an approved application. The application will be reviewed on its own merits by the City of Wilmington and may or may not be approved. The project must be in compliance with the terms of this permit in order for the transfer request to be considered. The permittee is responsible for compliance with all permit conditions until such time as the City of Wilmington approves the transfer request. Neither the sale of the project nor the conveyance of common area to a third party should be considered as an approved transfer of the permit.
16. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to enforcement action by the City of Wilmington, in accordance with Sections 18-52 and 18-53 and any other applicable section of the Land Development Code.
17. The City of Wilmington may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the City of Wilmington for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the City of Wilmington that the changes have been made.
18. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) having jurisdiction.
19. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by the City of Wilmington, such as the construction of additional or replacement stormwater management systems.
20. The permittee grants City of Wilmington Staff permission to enter the property during normal business hours for the purpose of inspecting all components of the permitted stormwater management facility.



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21. The permit issued shall continue in force and effect until revoked or terminated by the City of Wilmington. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and re-issuance or termination does not stay any permit condition.
22. The approved stormwater management plans and all documentation submitted as part of the approved stormwater management permit application package for this project are incorporated by reference and are enforceable parts of the permit.
23. The permittee shall submit a renewal request with all required forms and documentation at least 180 days prior to the expiration date of this permit.
24. If any one or more of the conditions of this permit is found to be unenforceable or otherwise invalidated, all remaining conditions shall remain in full effect.

Stormwater Management Permit issued this the 19th day of August 2021

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

for Tony Caudle, Interim City Manager
City of Wilmington

Permit 4774

SWP2021034



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STORMWATER MANAGEMENT PERMIT APPLICATION FORM
(Form SWP 2.3)

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.):
RiverLights Development - Single Family Phase 5-6
2. Location of Project (street address):
4410 River Road
City: Wilmington County: New Hanover Zip: 28412

II. PERMIT INFORMATION

- 1. Specify the type of project (check one): [] Low Density [x] High Density
[] Offsite Stormwater System [] Drainage Plan [] Redevelopment [] Other
If the project drains to an Offsite System, list the Stormwater Permit Number(s):
City of Wilmington: State - NCDEQ/DEMLR:
2. Is the project currently covered (whole or in part) by an existing City or State (NCDEQ/DEMLR) Stormwater Permit? [] Yes [x] No
If yes, list all applicable Stormwater Permit Numbers:
City of Wilmington: State - NCDEQ/DEMLR:
3. Additional Project Permit Requirements (check all applicable):
[] CAMA Major [x] Sedimentation/Erosion Control [] 404/401 Permit

III. CONTACT INFORMATION

- 1. Print Applicant / Signing Official's name and title (the developer, property owner, lessee, designated government official, individual, etc. who owns the project):
Applicant / Organization: NNP IV - Cape Fear River, LLC a Delaware LLC by Newland Real Estate Group, LLC, a Delaware LLC, its Agent/Development Manager, by Nick Cassala, its Vice President
Signing Official & Title: Nick Cassala, Vice President - Development

a. Contact information for Applicant / Signing Official:

Address: 109 Pier Master Point, Suite 209

City: Wilmington State: NC Zip: 28412

Phone: 910-473-5409 Email: ncassala@newlandco.com

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

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

2. Print Property Owner's name and title (if different from the applicant).

Property Owner / Organization: _____

Signing Official & Title: _____

a. Contact information for Property Owner:

Street Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

3. (Optional) Other Contact name and title (such as a construction supervisor) who would like to be copied on all correspondence:

Other Contact Person / Organization: Kenny Johnson

Signing Official & Title: Project Manager

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

Street Address: 109 Pier Master Point, Suite 209

City: Wilmington State: NC Zip: 28412

Phone: 910-338-1741 Email: kejohnson@newlandco.com

4. Agent Authorization: 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: Kathryn Espinoza, PE

Consulting Firm: McKim & Creed, Inc.

a. Contact information for consultant listed above:

Mailing Address: 243 North Front St

City: Wilmington State: NC Zip: 28401

Phone: 910-343-1048 Email: kespinoza@mckimcreed.com

IV. PROJECT INFORMATION

1. Total Property Area: 7,638,658 square feet
2. Total Coastal Wetlands Area: 1,504,760 square feet
3. Total Surface Water Area: 611,771 square feet
4. Total Property Area (1) – Total Coastal Wetlands Area (2) – Total Surface Water Area (3) = Total Project Area: 5,522,127 square feet.
5. Existing Impervious Surface within Project Area: 0 square feet
6. Existing Impervious Surface to be Removed/Demolished: 0 square feet
7. Existing Impervious Surface to Remain: 0 square feet
8. Total Onsite (within property boundary) Newly Constructed Impervious Surface (in square feet):

Buildings/Lots	1,268,400
Impervious Pavement	493,119
Pervious Pavement (total area / adjusted area w credit applied)	/
Impervious Sidewalks	146,699
Pervious Sidewalks (total area / adjusted area w credit applied)	/
Other (Describe)	
Future Development	74,600
Total Onsite Newly Constructed Impervious Surface	1,982,818

9. Total Onsite Impervious Surface
(Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) 1,982,818 square feet
10. Net Change in Onsite Impervious Surface (+ for net increase, - for net decrease) +1,982,818 square feet
11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 35.91 %
12. Total Offsite Newly Constructed Impervious Area (in square feet):

Impervious Pavement	
Pervious Pavement (total area / adjusted area w credit applied)	/
Impervious Sidewalks	
Pervious Sidewalks (total area / adjusted area w credit applied)	/
Other (Describe)	
Total Offsite Newly Constructed Impervious Surface	0

13. Complete the following information for each Stormwater SCM drainage area. Low Density and Drainage Plan projects (with no permeable pavements) may omit this section and skip to Section V.

Basin Information	wet pond SCM #1	infiltration SCM #2	infiltration SCM #3
Receiving Stream Name	Cape Fear	Cape Fear	Cape Fear
Receiving Stream Index Number	18-(71)	18-(71)	18-(71)
Stream Classification	CS	CS	CS
Total Drainage Area (sf)	429,918	269,999	340,236
On-Site Drainage Area (sf)	429,918	269,999	340,246
Off-Site Drainage Area (sf)	0	0	0
Buildings/Lots (sf)	121,800	73,100	96,100
Impervious Pavement (sf)	53,866	25,134	60,879
Pervious Pavement (total / adjusted) (sf)	/	/	/
Impervious Sidewalks (sf)	18,782	7,663	21,236
Pervious Sidewalks (total / adjusted) (sf)	/	/	/
Other (sf)	0	0	0
Future Development (sf)			
Existing Impervious to remain (sf)			
Offsite (sf)			
Total Impervious Area (sf)	194,448	105,897	178,215
Percent Impervious Area (%)	45.23%	39.22%	52.38%

Basin Information	wet pond SCM #4	infiltration SCM #5	infiltration SCM #6
Receiving Stream Name	Cape Fear	Cape Fear	Cape Fear
Receiving Stream Index Number	18-(71)	18-(71)	18-(71)
Stream Classification	CS	CS	CS
Total Drainage Area (sf)	672,040	397,394	594,463
On-Site Drainage Area (sf)	672,040	397,394	594,463
Off-Site Drainage Area (sf)	0	0	0
Buildings/Lots (sf)	220,500	141,250	146,000
Impervious Pavement (sf)	68,887	52,828	94,296
Pervious Pavement (total / adjusted) (sf)	/	/	/
Impervious Sidewalks (sf)	17,146	17,897	25,305
Pervious Sidewalks (total / adjusted) (sf)	/	/	/
Other (sf)	0	0	0
Future Development (sf)	34,205		40,395
Existing Impervious to remain (sf)			
Offsite (sf)			
Total Impervious Area (sf)	340,738	211,975	305,996
Percent Impervious Area (%)	50.70%	53.34%	51.47%

13. Complete the following information for each Stormwater SCM drainage area. Low Density and Drainage Plan projects (with no permeable pavements) may omit this section and skip to Section V.

Basin Information	infiltration SCM # 8	infiltration SCM # 1D	infiltration SCM # 13
Receiving Stream Name	Cape Fear	Cape Fear	Cape Fear
Receiving Stream Index Number	18-(71)	18-(71)	18-(71)
Stream Classification	SC	SC	SC
Total Drainage Area (sf)	140,995	569,440	93,587
On-Site Drainage Area (sf)	140,995	569,440	93,587
Off-Site Drainage Area (sf)	0	0	0
Buildings/Lots (sf)	52,650	173,275	20,700
Impervious Pavement (sf)	0	78,783	13,951
Pervious Pavement (total / adjusted) (sf)	/	/	/
Impervious Sidewalks (sf)	0	20,257	3,819
Pervious Sidewalks (total / adjusted) (sf)	/	/	/
Other (sf)			
Future Development (sf)			
Existing Impervious to remain (sf)			
Offsite (sf)			
Total Impervious Area (sf)	52,650	272,315	38,470
Percent Impervious Area (%)	37.34%	47.82%	41.11%

Basin Information	infiltration SCM # 14		Type of SCM SCM # Offsite
Receiving Stream Name	Cape Fear		Cape Fear
Receiving Stream Index Number	18-(71)		18-(71)
Stream Classification	SC		SC
Total Drainage Area (sf)	117,753		
On-Site Drainage Area (sf)	117,753		
Off-Site Drainage Area (sf)	0		
Buildings/Lots (sf)	19,400		105,225
Impervious Pavement (sf)	10,869		
Pervious Pavement (total / adjusted) (sf)	/	/	/
Impervious Sidewalks (sf)	2,315		
Pervious Sidewalks (total / adjusted) (sf)	/	/	/
Other (sf)			
Future Development (sf)			
Existing Impervious to remain (sf)			
Offsite (sf)			
Total Impervious Area (sf)	32,584		105,225
Percent Impervious Area (%)	27.67%		

V. SUBMITTAL REQUIREMENTS

Only complete application packages will be accepted and reviewed by the City. A complete package includes all of the items listed below. Copies of forms, deed restrictions, checklists as well as detailed instructions on how to complete this application form may be downloaded from the City of Wilmington Plan Review website below:

<https://www.wilmingtonnc.gov/departments/engineering/plan-review/stormwater-permits>

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

Please indicate that the following required information have been provided by initialing in the space provided for each item.

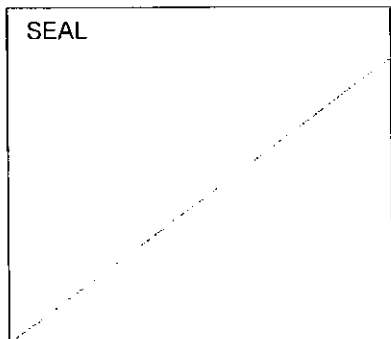
	Initials
1. One completed Stormwater Management Permit Application Form.	EM _____
2. One completed Supplement Form for each SCM proposed (signed, sealed and dated).	EM _____
3. One completed Operation & Maintenance agreement for each <u>type</u> of SCM.	EM _____
4. Proposed Deed Restrictions and Restrictive Covenants (for all subdivisions)	EM _____
5. Appropriate stormwater permit review fee.	EM _____
6. Minimum requirements identified on the Engineering Plan Review Checklist have been addressed.	EM _____
7. One set of calculations (sealed, signed and dated).	EM _____
8. A detailed narrative (one to two pages) describing the stormwater treatment/management system for the project.	EM _____
9. A USGS map identifying the site location. If the receiving stream is reported as class SA or the receiving stream drains to class SA waters within ½ mile of the site boundary, include the ½ mile radius on the map.	EM _____
10. A copy of the soils report, if applicable. Must meet NCDEQ SCM Manual and MDC requirements for the type of SCM proposed. The report must include boring logs and a map of boring locations.	EM _____
11. One full set of plans <u>folded to 8.5" x 14"</u> .	N/A _____
12. A map delineating and labeling the drainage area for each SCM proposed.	EM _____
13. A map delineating and labeling the drainage area for each inlet and conveyance proposed.	EM _____
14. A digital copy of the entire submittal package (can be submitted via flash drive, CD, email, dropbox or other file sharing system).	EM _____

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

I, _____, certify that I own the property identified in this permit application, and thus give permission to _____ with _____ 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 _____ dissolves their company and/or cancels or defaults on their lease agreement, or pending sale, responsibility for compliance with the City of Wilmington Stormwater Permit reverts back to me, the property owner. As the property owner, it is my responsibility to notify the City of Wilmington immediately and submit a completed Name/Ownership Change Form within 30 days; otherwise I will be operating a stormwater treatment facility without a valid permit. I understand that the operation of a stormwater treatment facility without a valid permit is a violation of the City of Wilmington Municipal Code of Ordinances and may result in appropriate enforcement including the assessment of civil penalties.

Signature: _____ Date: _____



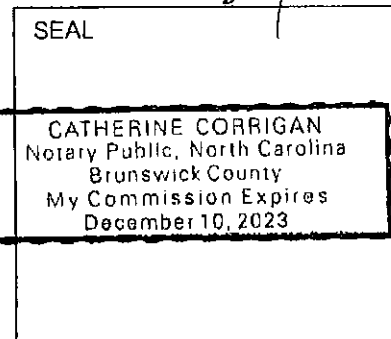
I, _____, a Notary Public for the State of _____, County of _____, do hereby certify that _____ personally appeared before me this day of _____, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

My commission expires: _____

VII. APPLICANT'S CERTIFICATION

I, Nick Cassala, 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 rules under the City's Comprehensive Stormwater Ordinance.

Signature: _____ Date: 4.7.2021



I, Catherine Corrigan, a Notary Public for the State of North Carolina, County of Brunswick, do hereby certify that Nick Cassala personally appeared before me this day of April 7, 2021, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

My commission expires: Dec 10, 2023



RIVERLIGHTS™

RiverLights Single Family Phase 5

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
543	65	4400	
544	65	4400	
545	65	4400	
546	65	4400	
547	65	4400	
548	65	4400	
549	65	4400	
550	65	4400	
551	65	4400	
552	65	4400	
553	65	4400	
554	65	4400	
555	65	4400	
556	65	4400	
557	65	4400	
558	75	5300	
559	75	5300	
560	65	4400	
561	65	4400	
562	65	4400	
563	65	4400	
564	65	4400	
565	65	4400	
566	75	5300	
567	75	5300	
568	75	5300	
569	75	5300	
570	65	4400	
571	65	4400	
572	65	4400	
573	65	4400	
574	65	4400	
575	75	5300	
576	75	5300	
577	75	5300	
578	75	5300	
579	65	4400	



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RiverLights Single Family Phase 5

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
580	65	4400	
581	65	4400	
582	65	4400	
583	65	4400	
584	65	4400	
585	65	4400	
586	65	4400	
587	55	3900	
588	55	3900	
589	55	3900	
590	55	3900	
591	55	3900	
592	55	3900	
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605	55	3900	
606	55	3900	
607	55	3900	
608	55	3900	
609	55	3900	
610	55	3900	
611	55	3900	
612	55	3900	
613	50	3800	
614	55	3900	
615	55	3900	
616	55	3900	



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RiverLights Single Family Phase 5

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
617	55	3900	
618	55	3900	
619	55	3900	
620	55	3900	
621	55	3900	
622	55	3900	
623	55	3900	
624	55	3900	
625	55	3900	
626	55	3900	
627	55	3900	
628	55	3900	
629	50	3800	
630	55	3900	
631	55	3900	
632	55	3900	
633	55	3900	
634	55	3900	
635	55	3900	
636	50	3800	
637	50	3800	
638	50	3800	
639	50	3800	
640	50	3800	
641	50	3800	
642	50	3800	
643	50	3800	
644	50	3800	
645	50	3800	
646	50	3800	
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648	50	3800	
649	50	3800	
650	50	3800	
651	50	3800	
652	50	3800	
653	50	3800	



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RiverLights Single Family Phase 5

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
654	50	3800	
655	50	3800	
656	55	3900	
657	55	3900	
658	55	3900	
659	55	3900	
660	55	3900	
661	55	3900	
662	75	5300	
663	75	5300	
664	75	5300	
665	75	5300	
666	75	5300	
667	75	5300	
668	55	3900	
669	55	3900	
670	55	3900	
671	55	3900	
672	55	3900	
673	55	3900	
674	55	3900	
675	55	3900	
676	55	3900	
677	55	3900	
678	55	3900	
679	75	5300	
680	75	5300	
681	75	5300	
682	75	5300	
683	75	5300	
684	75	5300	
685	75	5300	



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RiverLights Single Family Phase 6

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
686	50	3800	
687	50	3800	
688	50	3800	
689	50	3800	
690	50	3800	
691	45	3500	
692	45	3500	
693	45	3500	
694	45	3500	
695	45	3500	
696	45	3500	
697	45	3500	
698	45	3500	
699	45	3500	
700	45	3500	
701	45	3500	
702	45	3500	
703	45	3500	
704	45	3500	
705	45	3500	
706	45	3500	
707	45	3500	
708	45	3500	
709	45	3500	
710	45	3500	
711	45	3500	
712	45	3500	
713	45	3500	
714	45	3500	
715	50	3800	
716	50	3800	
717	50	3800	
718	50	3800	
719	50	3800	
720	50	3800	
721	50	3800	
722	50	3800	



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Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
723	75	5300	
724	75	5300	
725	75	5300	
726	50	3800	
727	50	3800	
728	50	3800	
729	50	3800	
730	50	3800	
731	50	3800	
732	50	3800	
733	50	3800	
734	65	4400	
735	65	4400	
736	65	4400	
737	65	4400	
738	65	4400	
739	55	3900	
740	55	3900	
741	55	3900	
742	55	3900	
743	65	4400	
744	65	4400	
745	65	4400	
746	55	3900	
747	55	3900	
748	55	3900	
749	55	3900	
750	55	3900	
751	55	3900	
752	55	3900	
753	55	3900	
754	32	2650	
755	32	2650	
756	32	2650	
757	32	2650	
758	32	2650	
759	32	2650	



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RiverLights Single Family Phase 6

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
760	32	2650	
761	32	2650	
762	32	2650	
763	32	2650	
764	32	2650	
765	32	2650	
766	55	3900	
767	55	3900	
768	55	3900	
769	65	4400	
770	65	4400	
771	75	5300	
772	65	4400	
773	65	4400	
774	65	4400	
775	65	4400	
776	65	4400	
777	55	3900	
778	55	3900	
779	55	3900	
780	55	3900	
781	55	3900	
782	55	3900	
783	55	3900	
784	55	3900	
785	55	3900	
786	55	3900	
787	55	3900	
788	55	3900	
789	55	3900	
790	55	3900	
791	55	3900	
792	50	3800	
793	50	3800	
794	45	3500	
795	45	3500	
796	45	3500	



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Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
797	45	3500	
798	45	3500	
799	45	3500	
800	45	3500	
801	45	3500	
802	45	3500	
803	45	3500	
804	50	3800	
805	50	3800	
806	50	3800	
807	50	3800	
808	50	3800	
809	50	3800	
810	50	3800	
811	50	3800	
812	50	3800	
813	50	3800	
814	50	3800	
815	50	3800	
816	50	3800	
817	50	3800	
818	50	3800	
819	50	3800	
820	50	3800	
821	50	3800	
822	50	3800	
823	50	3800	
824	50	3800	
825	50	3800	
826	50	3800	
827	50	3800	
828	TH	1450	
829	TH	1450	
830	TH	1450	
831	TH	1450	
832	TH	1450	
833	TH	1450	



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RiverLights Single Family Phase 6

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
834	TH	1450	
835	TH	1450	
836	TH	1450	
837	TH	1450	
838	TH	1450	
839	TH	1450	
840	TH	1450	
841	TH	1450	
842	TH	1450	
843	TH	1450	
844	TH	1450	
845	TH	1450	
846	TH	1450	
847	TH	1450	
848	TH	1450	
849	TH	1450	
850	TH	1450	
851	TH	1450	
852	TH	1450	
853	TH	1450	
854	TH	1450	
855	TH	1450	
856	TH	1450	
857	TH	1450	
858	TH	1450	
859	TH	1450	
860	TH	1450	
861	32	2650	
862	32	2650	
863	32	2650	
864	32	2650	
865	32	2650	
866	45	3500	
867	45	3500	
868	32	2650	
869	32	2650	
870	32	2650	



RIVERLIGHTS™

RiverLights Single Family Phase 6

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
871	32	2650	
872	32	2650	
873	32	2650	
874	32	2650	
875	32	2650	
876	32	2650	
877	32	2650	
878	32	2650	
879	32	2650	
880	32	2650	
881	32	2650	
882	32	2650	
883	32	2650	
884	32	2650	
885	32	2650	
886	32	2650	
887	45	3500	
888	45	3500	
889	45	3500	
890	45	3500	
891	45	3500	
892	45	3500	
893	45	3500	
894	45	3500	
895	45	3500	
896	45	3500	
897	45	3500	
898	45	3500	
899	45	3500	
900	45	3500	
901	45	3500	
902	45	3500	
903	45	3500	
904	55	3900	
905	55	3900	
906	55	3900	
907	55	3900	



RIVERLIGHTS™

RiverLights Single Family Phase 6

Lot #	Lot Width (FT)	Calculated BUA (SF)	Actual BUA (SF)
908	55	3900	
909	55	3900	
910	55	3900	

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
 401 CERTIFICATION APPLICATION FORM
WET DETENTION BASIN SUPPLEMENT

*This form must be filled out, printed and submitted.
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I. PROJECT INFORMATION	
Project name	RiverLights - Single Family Phase 5 & 6
Contact person	Kathryn Espinoza, PE
Phone number	910-343-1048
Date	5/11/2021
Drainage area number	1 (SCM 1)

II. DESIGN INFORMATION	
Site Characteristics	
Drainage area	429,918 ft ²
Impervious area, post-development	194,448 ft ²
% impervious	45.23 %
Design rainfall depth	1.0 in
Storage Volume: Non-SA Waters	
Minimum volume required	17,500 ft ³ OK
Volume provided	22,999 ft ³ OK, volume provided is equal to or in excess of volume required.
Storage Volume: SA Waters	
1.5" runoff volume	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?	Y (Y or N)
1-yr, 24-hr rainfall depth	3.7 in
Rational C, pre-development	0.10 (unitless)
Rational C, post-development	0.30 (unitless)
Rainfall intensity: 1-yr, 24-hr storm	0.16 in/hr OK
Pre-development 1-yr, 24-hr peak flow	0.60 ft ³ /sec
Post-development 1-yr, 24-hr peak flow	7.58 ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	6.99 ft ³ /sec
Elevations	
Temporary pool elevation	7.50 fmsl
Permanent pool elevation	6.50 fmsl
SHWT elevation (approx. at the perm. pool elevation)	8.11 fmsl
Top of 10ft vegetated shelf elevation	7.00 fmsl
Bottom of 10ft vegetated shelf elevation	6.00 fmsl Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	2.00 fmsl
Sediment cleanout, bottom elevation	1.00 fmsl Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00 ft
Is there additional volume stored above the state-required temp. pool?	Y (Y or N)
Elevation of the top of the additional volume	7.50 fmsl OK

II. DESIGN INFORMATION

Surface Areas		
Area, temporary pool	24,551 ft ²	
Area REQUIRED, permanent pool	6,191 ft ²	
SA/DA ratio	1.44 (unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	16,124 ft ²	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	13,977 ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	6,972 ft ²	
Volumes		
Volume, temporary pool	22,999 ft ³	OK
Volume, permanent pool, V_{perm_pool}	61,070 ft ³	
Volume, forebay (sum of forebays if more than one forebay)	13,090 ft ³	
Forebay % of permanent pool volume	21.4% %	OK
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	1.44 (unitless)	
Average depth (used in SA/DA table):		
Calculation option 1 used? (See Figure 10-2b)	Y (Y or N)	
Volume, permanent pool, V_{perm_pool}	61,070 ft ³	
Area provided, permanent pool, A_{perm_pool}	16,124 ft ²	
Average depth calculated	4.33 ft	OK
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)	4.5 ft	OK
Calculation option 2 used? (See Figure 10-2b)	N (Y or N)	
Area provided, permanent pool, A_{perm_pool}	16,124 ft ²	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	13,977 ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	6,972 ft ²	
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	4.00 ft	
Average depth calculated	ft	
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)	ft	
Drawdown Calculations		
Drawdown through orifice?	Y (Y or N)	
Diameter of orifice (if circular)	2.50 in	
Area of orifice (if non-circular)	in ²	
Coefficient of discharge (C_D)	0.60 (unitless)	
Driving head (H_b)	0.90 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	0.60 ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	7.58 ft ³ /sec	
Storage volume discharge rate (through discharge orifice or weir)	0.09 ft ³ /sec	
Storage volume drawdown time	2.97 days	OK, draws down in 2-5 days.
Additional Information		
Vegetated side slopes	3 : 1	OK
Vegetated shelf slope	6 : 1	Insufficient shelf slope.
Vegetated shelf width	6.0 ft	Insufficient shelf length.
Length of flowpath to width ratio	3.7 : 1	OK
Length to width ratio	2.7 : 1	OK
Trash rack for overflow & orifice?	Y (Y or N)	OK
Freeboard provided	2.00 ft	OK
Vegetated filter provided?	N (Y or N)	OK
Recorded drainage easement provided?	Y (Y or N)	OK
Captures all runoff at ultimate build-out?	Y (Y or N)	OK
Drain mechanism for maintenance or emergencies is:	Pump	



STORMWATER MANAGEMENT PERMIT APPLICATION FORM
 401 CERTIFICATION APPLICATION FORM



INFILTRATION BASIN SUPPLEMENT

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I. PROJECT INFORMATION

Project Name	RiverLights - Single family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	3/25/2021
Drainage Area Number	2 (SCM 2)

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	270,000.00	ft ²
Impervious area	105,897.00	ft ²
Percent impervious	39.22	%
Design rainfall depth	1.00	in
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.70	in
1-yr, 24-hr intensity	0.16	in/hr
Pre-development 1-yr, 24-hr discharge	0.60	ft ³ /sec
Post-development 1-yr, 24-hr discharge	3.49	ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	2.89	ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum design volume required	9,067.00	ft ³
Design volume provided	18,623.00	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	Leon (Le)	
Infiltration rate	26.19	in/hr
SHWT elevation	10.23	fmsl
Basin Design Parameters		
Drawdown time	0.13	days
Basin side slopes	12.00	:1
Basin bottom elevation	18.00	fmsl
Storage elevation	20.00	fmsl
Storage Surface Area	16,936.00	ft ²
Top elevation	20.00	fmsl
Basin Bottom Dimensions		
Basin length	171.00	ft
Basin width	31.03	ft
Bottom Surface Area	5,306.00	ft ²

Additional Information

Maximum runoff to each inlet to the basin?	2.00	ac-in	OK
Length of vegetative filter for overflow	-	ft	OK
Distance to structure	50.00	ft	OK
Distance from surface waters	50.00	ft	OK
Distance from water supply well(s)	-	ft	OK
Separation from impervious soil layer	-	ft	OK
Naturally occurring soil above shwt	7.27	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	sump in catch basin		



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INFILTRATION BASIN SUPPLEMENT

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I. PROJECT INFORMATION

Project Name	RiverLights - Single family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	5/11/2021
Drainage Area Number	3 (SCM 3)

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	340,236.00	ft ²
Impervious area	178,215.00	ft ²
Percent impervious	52.38	%
Design rainfall depth	1.00	in
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.70	in
1-yr, 24-hr intensity	0.16	in/hr
Pre-development 1-yr, 24-hr discharge	0.26	ft ³ /sec
Post-development 1-yr, 24-hr discharge	11.08	ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	10.82	ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum design volume required	15,373.00	ft ³
Design volume provided	23,936.00	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	Kureb (Kr)	
Infiltration rate	27.10	in/hr
SHWT elevation	4.64	fmsl
Basin Design Parameters		
Drawdown time	0.09	days
Basin side slopes	3.00	:1
Basin bottom elevation	7.50	fmsl
Storage elevation	8.00	fmsl
Storage Surface Area	12,050.00	ft ²
Top elevation	10.25	fmsl
Basin Bottom Dimensions		
Basin length		ft
Basin width		ft
Bottom Surface Area		ft ²

Additional Information

Maximum runoff to each inlet to the basin?	-	ac-in	Maximum of 2 acre-inches allowed
Length of vegetative filter for overflow	-	ft	OK
Distance to structure	50.00	ft	OK
Distance from surface waters	150.00	ft	OK
Distance from water supply well(s)	-	ft	OK
Separation from impervious soil layer	-	ft	OK
Naturally occurring soil above shwt	2.86	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	sump in catch basin		

STORMWATER MANAGEMENT PERMIT APPLICATION FORM
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WET DETENTION BASIN SUPPLEMENT

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I. PROJECT INFORMATION

Project name	RiverLights - Single Family Phase 5 & 6
Contact person	Kathryn Espinoza, PE
Phone number	910-343-1048
Date	5/11/2021
Drainage area number	4 (SCM 4)

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	672,040 ft ²	
Impervious area, post-development	340,738 ft ²	
% impervious	50.70 %	
Design rainfall depth	1.0 in	
Storage Volume: Non-SA Waters		
Minimum volume required	27,157 ft ³	Insufficient required volume.
Volume provided	64,679 ft ³	OK, volume provided is equal to or in excess of volume required.
Storage Volume: SA Waters		
1.5" runoff volume		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?	Y	(Y or N)
1-yr, 24-hr rainfall depth	3.7 in	
Rational C, pre-development	0.10	(unitless)
Rational C, post-development	0.30	(unitless)
Rainfall intensity: 1-yr, 24-hr storm	0.16 in/hr	OK
Pre-development 1-yr, 24-hr peak flow	0.26 ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	10.64 ft ³ /sec	
Pre/Post 1-yr, 24-hr peak flow control	10.38 ft ³ /sec	
Elevations		
Temporary pool elevation	12.40 fmsl	
Permanent pool elevation	9.00 fmsl	
SHWT elevation (approx. at the perm. pool elevation)	9.36 fmsl	
Top of 10ft vegetated shelf elevation	9.50 fmsl	
Bottom of 10ft vegetated shelf elevation	8.50 fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	3.00 fmsl	
Sediment cleanout, bottom elevation	2.00 fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00 ft	
Is there additional volume stored above the state-required temp. pool?	Y	(Y or N)
Elevation of the top of the additional volume	12.40 fmsl	OK

II. DESIGN INFORMATION
Surface Areas

Area, temporary pool	38,827	ft ²	
Area REQUIRED, permanent pool	10,820	ft ²	
SA/DA ratio	1.61	(unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	28,951	ft ²	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	20,720	ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	11,364	ft ²	

Volumes

Volume, temporary pool	64,679	ft ³	OK
Volume, permanent pool, V_{perm_pool}	119,699	ft ³	
Volume, forebay (sum of forebays if more than one forebay)	18,648	ft ³	
Forebay % of permanent pool volume	15.6%	%	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	1.61	(unitless)	

Average depth (used in SA/DA table):

Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)	
Volume, permanent pool, V_{perm_pool}	119,699	ft ³	
Area provided, permanent pool, A_{perm_pool}	28,951	ft ²	
Average depth calculated	5.75	ft	OK
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)	6.0	ft	OK
Calculation option 2 used? (See Figure 10-2b)	N	(Y or N)	
Area provided, permanent pool, A_{perm_pool}	28,951	ft ²	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	20,720	ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	11,364	ft ²	
"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	5.50	ft	
Average depth calculated		ft	
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)		ft	

Drawdown Calculations

Drawdown through orifice?	Y	(Y or N)	
Diameter of orifice (if circular)	3.00	in	
Area of orifice (if-non-circular)		in ²	
Coefficient of discharge (C_d)	0.60	(unitless)	
Driving head (H_o)	3.28	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	0.26	ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	10.64	ft ³ /sec	
Storage volume discharge rate (through discharge orifice or weir)	0.25	ft ³ /sec	
Storage volume drawdown time	3.03	days	OK, draws down in 2-5 days.

Additional Information

Vegetated side slopes	3	:1	OK
Vegetated shelf slope	6	:1	Insufficient shelf slope.
Vegetated shelf width	6.0	ft	Insufficient shelf length.
Length of flowpath to width ratio	6.7	:1	OK
Length to width ratio	2.5	:1	OK
Trash rack for overflow & orifice?	Y	(Y or N)	OK
Freeboard provided		ft	
Vegetated filter provided?	N	(Y or N)	OK
Recorded drainage easement provided?	Y	(Y or N)	OK
Captures all runoff at ultimate build-out?	Y	(Y or N)	OK
Drain mechanism for maintenance or emergencies is:	Pump		



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I. PROJECT INFORMATION

Project Name	RiverLights - Single family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	3/25/2021
Drainage Area Number	5 (SCM 5)

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	397,394.00	ft ²
Impervious area	211,975.00	ft ²
Percent impervious	53.34	%
Design rainfall depth	1.00	in
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.70	in
1-yr, 24-hr intensity	0.16	in/hr
Pre-development 1-yr, 24-hr discharge	0.60	ft ³ /sec
Post-development 1-yr, 24-hr discharge	7.24	ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	6.64	ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum design volume required	14,780.00	ft ³
Design volume provided	22,409.00	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	Kureb (Kr)	
Infiltration rate	17.23	in/hr
SHWT elevation	9.61	fmsl
Basin Design Parameters		
Drawdown time	0.43	days
Basin side slopes	3.00	:1
Basin bottom elevation	15.00	fmsl
Storage elevation	16.00	fmsl
Storage Surface Area	3,041.00	ft ²
Top elevation	19.50	fmsl
Basin Bottom Dimensions		
Basin length	43.11	ft
Basin width	6.10	ft
Bottom Surface Area	263.00	ft ²

Additional Information

Maximum runoff to each inlet to the basin?	2.00	ac-in	OK
Length of vegetative filter for overflow	-	ft	OK
Distance to structure	50.00	ft	OK
Distance from surface waters	50.00	ft	OK
Distance from water supply well(s)	-	ft	OK
Separation from impervious soil layer	-	ft	OK
Naturally occurring soil above shwt	5.39	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	sump in catch basin		



STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM



Permit No. 2021034
(to be provided by DWQ) city

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	RiverLights - Single family Phase 5/6
Contact person	Kathryn Espinoza, PE
Phone number	910-343-1048
Date	3/25/2021
Drainage area number	6 (SCM 6)

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

Site Characteristics		
Drainage area	594,463.00	ft ²
Impervious area	305,996.00	ft ²
Percent impervious	51.5%	%
Design rainfall depth	1.00	in
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.70	in
1-yr, 24-hr intensity	0.16	in/hr
Pre-development 1-yr, 24-hr discharge	0.60	ft ³ /sec
Post-development 1-yr, 24-hr discharge	9.02	ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	8.43	ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum volume required	25,427.00	ft ³
Volume provided	59,999.00	ft ³
		OK for non-SR 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 volume required		ft ³
Volume provided		ft ³
Soils Report Summary		
Soil type	Kureb (Kr)	
Infiltration rate	25.18	in/hr
SHWT elevation	16.11	fmsl
Trench Design Parameters		
Drawdown time	0.16	days
		OK
Perforated pipe diameter	48.00	in
Perforated pipe length	176.00	ft
Number of laterals	17	
Stone type (if used)	porous	
Stone void ratio	40	
Stone is free of fines?	Y	(Y or N) OK

City

Trench Elevations

Bottom elevation	18.11	fmsl	OK
Storage/overflow elevation	22.00	fmsl	
Top elevation	23.11	fmsl	

Trench Dimensions

Length (long dimension)	180.00	ft	
Width (short dimension)	104.00	ft	
Height (depth)	5.00	ft	OK

Additional Information

Maximum volume to each inlet into the trench?	2.00	ac-in	OK
Length of vegetative filter for overflow	-	ft	OK
Number of observation wells	10		OK
Distance to structure	50.00	ft	OK
Distance from surface waters	50.00	ft	OK
Distance from water supply well(s)	-	ft	OK
Separation from impervious soil layer	-	ft	OK
Depth of naturally occurring soil above SHWT	2.50	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
Trench wrapped with geotextile fabric?	Y	(Y or N)	OK

Pretreatment device provided sump in catch basin



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	RiverLights - Single Family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	3/25/2021
Drainage Area Number	8 (SCM 8)

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	140,995.00	ft ²
Impervious area	52,650.00	ft ²
Percent impervious	37.34	%
Design rainfall depth	1.00	in
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.70	in
1-yr, 24-hr intensity	0.16	in/hr
Pre-development 1-yr, 24-hr discharge	0.60	ft ³ /sec
Post-development 1-yr, 24-hr discharge	3.19	ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	2.60	ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum design volume required	4,536.00	ft ³
Design volume provided	7,478.00	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	Kureb (Kr)	
Infiltration rate	27.72	in/hr
SHWT elevation	10.09	fmsl
Basin Design Parameters		
Drawdown time	0.02	days
Basin side slopes	3.00	:1
Basin bottom elevation	15.00	fmsl
Storage elevation	15.25	fmsl
Storage Surface Area	14,933.00	ft ²
Top elevation	16.00	fmsl
Basin Bottom Dimensions		
Basin length	547.30	ft
Basin width	22.50	ft
Bottom Surface Area	11,395.00	ft ²

Additional Information

Maximum runoff to each inlet to the basin?
 Length of vegetative filter for overflow
 Distance to structure
 Distance from surface waters
 Distance from water supply well(s)
 Separation from impervious soil layer
 Naturally occurring soil above shwt
 Bottom covered with 4-in of clean sand?
 Proposed drainage easement provided?
 Capures all runoff at ultimate build-out?
 Bypass provided for larger storms?
 Pretreatment device provided

-	ac-in	Maximum of 2 acre-inches allowed
-	ft	OK
50.00	ft	OK
150.00	ft	OK
-	ft	OK
-	ft	OK
4.91	ft	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
sump in catch basin		



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	RiverLights - Single family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	3/25/2021
Drainage Area Number	10 (SCM 10)

II. DESIGN INFORMATION	
Site Characteristics	
Drainage area	569,440.00 ft ²
Impervious area	272,315.00 ft ²
Percent impervious	47.82 %
Design rainfall depth	1.00 in
Peak Flow Calculations	
1-yr, 24-hr rainfall depth	3.70 in
1-yr, 24-hr intensity	0.16 in/hr
Pre-development 1-yr, 24-hr discharge	0.60 ft ³ /sec
Post-development 1-yr, 24-hr discharge	8.21 ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	7.61 ft ³ /sec
Storage Volume: Non-SA Waters	
Minimum design volume required	22,796.00 ft ³
Design volume provided	54,527.00 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	Kureb (Kr)
Infiltration rate	26.19 in/hr
SHWT elevation	10.23 fmsl
Basin Design Parameters	
Drawdown time	0.13 days OK
Basin side slopes	3.00 :1 OK
Basin bottom elevation	18.50 fmsl OK
Storage elevation	19.00 fmsl
Storage Surface Area	16,487.00 ft ²
Top elevation	22.50 fmsl
Basin Bottom Dimensions	
Basin length	193.00 ft
Basin width	81.20 ft
Bottom Surface Area	15,676.00 ft ²

Additional Information

Maximum runoff to each inlet to the basin?
 Length of vegetative filter for overflow
 Distance to structure
 Distance from surface waters
 Distance from water supply well(s)
 Separation from impervious soil layer
 Naturally occurring soil above shwt
 Bottom covered with 4-in of clean sand?
 Proposed drainage easement provided?
 Captures all runoff at ultimate build-out?
 Bypass provided for larger storms?
 Pretreatment device provided

-	ac-in	Maximum of 2 acre-inches allowed
-	ft	OK
50.00	ft	OK
150.00	ft	OK
-	ft	OK
-	ft	OK
7.27	ft	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
sump in catch basin		



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	RiverLights - Single family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	3/25/2021
Drainage Area Number	13 (SCM 13)

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

Site Characteristics		
Drainage area	93,587.00	ft ²
Impervious area	38,470.00	ft ²
Percent impervious	41.11	%
Design rainfall depth	1.00	in
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.70	in
1-yr, 24-hr intensity	0.16	in/hr
Pre-development 1-yr, 24-hr discharge	0.60	ft ³ /sec
Post-development 1-yr, 24-hr discharge	0.92	ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	0.32	ft ³ /sec
Storage Volume: Non-SA Waters		
Minimum design volume required	3,275.00	ft ³
Design volume provided	3,509.00	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	Kureb (Kr)	
Infiltration rate	27.12	in/hr
SHWT elevation	5.50	fmsl
Basin Design Parameters		
Drawdown time	0.04	days
Basin side slopes	3.00	:1
Basin bottom elevation	12.50	fmsl
Storage elevation	13.00	fmsl
Storage Surface Area	5,032.00	ft ²
Top elevation	14.00	fmsl
Basin Bottom Dimensions		
Basin length	75.83	ft
Basin width	47.00	ft
Bottom Surface Area	3,564.00	ft ²

Additional Information

Maximum runoff to each inlet to the basin?
 Length of vegetative filter for overflow
 Distance to structure
 Distance from surface waters
 Distance from water supply well(s)
 Separation from impervious soil layer
 Naturally occurring soil above shwt
 Bottom covered with 4-in of clean sand?
 Proposed drainage easement provided?
 Captures all runoff at ultimate build-out?
 Bypass provided for larger storms?
 Pretreatment device provided

-	ac-in	Maximum of 2 acre-inches allowed
-	ft	OK
50.00	ft	OK
50.00	ft	OK
-	ft	OK
-	ft	OK
7.00	ft	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
Y	(Y or N)	OK
sump in catch basin		



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	RiverLights - Single family Phase 5/6
Contact Person	Kathryn Espinoza, PE
Phone Number	910-343-1048
Date	3/25/2021
Drainage Area Number	14 (SCM 14)

II. DESIGN INFORMATION	
Site Characteristics	
Drainage area	117,753.00 ft ²
Impervious area	32,584.00 ft ²
Percent impervious	27.67 %
Design rainfall depth	1.00 in
Peak Flow Calculations	
1-yr, 24-hr rainfall depth	3.70 in
1-yr, 24-hr intensity	0.16 in/hr
Pre-development 1-yr, 24-hr discharge	0.60 ft ³ /sec
Post-development 1-yr, 24-hr discharge	0.65 ft ³ /sec
Pre/Post 1-yr, 24-hr peak flow control	0.06 ft ³ /sec
Storage Volume: Non-SA Waters	
Minimum design volume required	2,934.00 ft ³
Design volume provided	9,863.00 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	Kureb (Kr)
Infiltration rate	27.10 in/hr
SHWT elevation	5.50 fmsl
Basin Design Parameters	
Drawdown time	0.18 days OK
Basin side slopes	3.00 :1 OK
Basin bottom elevation	9.50 fmsl OK
Storage elevation	10.00 fmsl
Storage Surface Area	4,750.00 ft ²
Top elevation	11.50 fmsl
Basin Bottom Dimensions	
Basin length	158.64 ft
Basin width	12.50 ft
Bottom Surface Area	1,983.00 ft ²

Additional Information

Maximum runoff to each inlet to the basin?	2.00	ac-in	OK
Length of vegetative filter for overflow	-	ft	OK
Distance to structure	50.00	ft	OK
Distance from surface waters	50.00	ft	OK
Distance from water supply well(s)	-	ft	OK
Separation from impervious soil layer	-	ft	OK
Naturally occurring soil above shwt	4.00	ft	OK
Bottom covered with 4-in of clean sand?	Y	(Y or N)	OK
Proposed drainage easement provided?	Y	(Y or N)	OK
Captures all runoff at ultimate build-out?	Y	(Y or N)	OK
Bypass provided for larger storms?	Y	(Y or N)	OK
Pretreatment device provided	sump in catch basin		

Permit Number: 2021034
 (to be provided by City of Wilmington)
 SCM Drainage Basin #: 1

Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this SCM. This maintenance record will be kept in a log in a known set location. Any deficient SCM 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 pollutant removal efficiency of the SCM.

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.**

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.

SCM element:	Potential problem:	How to remediate the problem:
The entire SCM	Trash/debris is present.	Remove the trash/debris.
The perimeter of the SCM	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)
 SCM Drainage Basin #: | _____

SCM element:	Potential problem:	How to remediate the problem:
The inlet device:	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.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and replace with clean stone.
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 SCM.
	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
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
	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 SCM.

Permit Number: _____
 (to be provided by City of Wilmington)
 SCM Drainage Basin #: 1

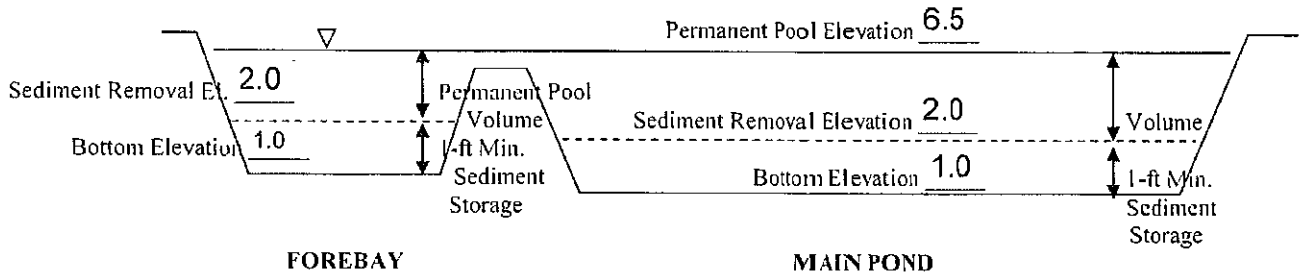
SCM element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).
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 Department of Environment and Natural Resources regional Office.

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 4.5 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 4.5 feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM
(fill in the blanks)



Permit Number: 2021034
(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: RiverLights Development - Single Family Phase 5/6

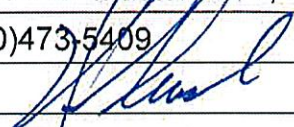
SCM drainage basin number: 1

Print name: NNP IV - Cape Fear River, LLC a Delaware LLC by Newland Real Estate Group, LLC, a Delaware LLC, its Agent/Development Manager, by Nick Cassala, its Vice President

Title: Vice President Operations-RiverLights

Address: 109 Pier Master Point, Suite 209, Wilmington, NC 28412

Phone: (910)473-5409

Signature: 

Date: 5.11.2021

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, Catherine Corrigan, a Notary Public for the State of North Carolina, County of Brunswick, do hereby certify that Nick Cassala personally appeared before me this 11 day of May, 2021, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires Dec 10, 2023

Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this SCM. This maintenance record will be kept in a log in a known set location. Any deficient SCM 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 pollutant removal efficiency of the SCM.

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.

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.

SCM element:	Potential problem:	How to remediate the problem:
The entire SCM	Trash/debris is present.	Remove the trash/debris.
The perimeter of the SCM	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)
 SCM Drainage Basin #: 4

SCM element:	Potential problem:	How to remediate the problem:
The inlet device:	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.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and replace with clean stone.
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 SCM.
	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
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
	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 SCM.

Permit Number: _____
 (to be provided by City of Wilmington)
 SCM Drainage Basin #: 4

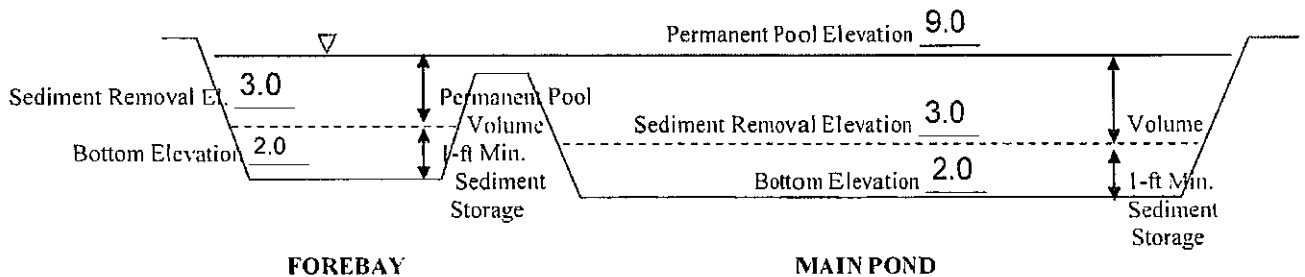
SCM element:	Potential problem:	How I will remediate the problem:
The main treatment area (continued)	Algal growth covers over 25% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).
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 Department of Environment and Natural Resources regional Office.

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 6.0 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 6.0 feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM
(fill in the blanks)



Permit Number: 2021034
(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: RiverLights Development - Singe Family Phase 5/6

SCM drainage basin number: 4

Print name: NNP IV - Cape Fear River, LLC a Delaware LLC by Newland Real Estate Group, LLC, a Delaware LLC. its Agent/Development Manager. by Nick Cassala. its Vice President

Title: Vice President Operations-RiverLights

Address: 109 Pier Master Point, Suite 209, Wilmington, NC 28412

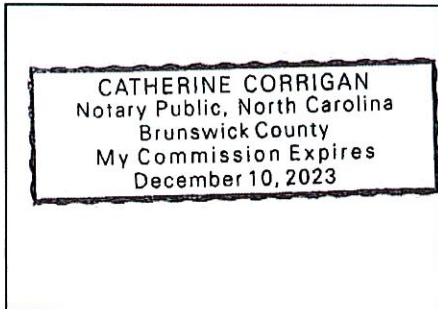
Phone: (910)473-5409

Signature: [Handwritten Signature]

Date: 5.11.2021

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, Catherine Corrigan, a Notary Public for the State of North Carolina, County of Brunswick, do hereby certify that Nick Cassala personally appeared before me this 11 day of May, 2021, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires Dec 10, 2023

Infiltration Basin Operation and Maintenance Agreement

I will keep a maintenance record on this SCM. This maintenance record will be kept in a log in a known set location. Any deficient SCM 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 pollutant removal efficiency of the SCM.

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.

SCM element:	Potential problem:	How to remediate the problem:
The entire SCM	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.

SCM element:	Potential problem:	How to 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 SCM. Replace any media that was removed in the process. Revegetate disturbed areas immediately.
	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 SCM. 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 local NC Department of Environment and Natural Resources Regional Office.

Permit Number: 2021034
(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: RiverLights Development - Single Family Phase 5/6

SCM drainage basin number: 2,3,5,8,10,13, & 14

Print name: NNP IV - Cape Fear River, LLC a Delaware LLC by Newland Real Estate Group, LLC, a Delaware LLC, its Agent/Development Manager, by Nick Cassala, its Vice President

Title: Vice President Operations-RiverLights

Address: 109 Pier Master Point, Suite 209, Wilmington, NC 28412

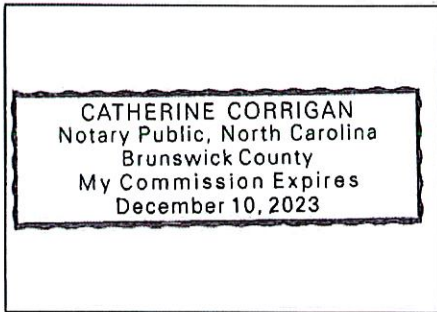
Phone: (910)473-5409

Signature: *Nick Cassala*

Date: 5.11.2021

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, Catherine Corrigan, a Notary Public for the State of North Carolina, County of Brunswick, do hereby certify that Nick Cassala personally appeared before me this 11 day of May, 2021, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires Dec 10, 2023

Infiltration Trench Operation and Maintenance Agreement

I will keep a maintenance record on this SCM. This maintenance record will be kept in a log in a known set location. Any deficient SCM 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 pollutant removal efficiency of the SCM.

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.

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.

SCM element:	Potential problem:	How to remediate the problem:
The entire SCM	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 SCM.
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.

SCM element:	Potential problem:	How to 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 SCM.
	Grass or other plants are growing on the surface of the trench.	Do not pull the weeds (may pull out media as well). Wipe them with a systemic herbicide such as glyphosate and then return within the week to remove them by hand. (Another option is to pour boiling water on them or steam them.)
The observation well(s)	Water present more than three days after a storm event.	Clean out any clogged underdrain pipes. Consult an appropriate professional for clogged soil subgrade.
The emergency overflow berm	Erosion or other signs of damage have occurred at the outlet.	Repair or replace the berm.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Repair the damage and improve the flow dissipation structure.

Permit Number: 202034
(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: RiverLights Development - Single Family Phase 5/6

SCM drainage basin number: 6

Print name: NNP IV - Cape Fear River, LLC a Delaware LLC by Newland Real Estate Group, LLC, a Delaware LLC, its Agent/Development Manager, by Nick Cassala, its Vice President

Title: Vice President Operations-RiverLights

Address: 109 Pier Master Point, Suite 209, Wilmington, NC 28412

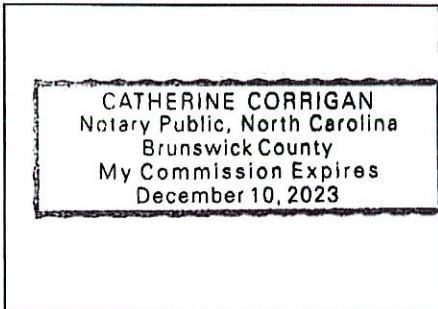
Phone: (910)473-5409

Signature: 

Date: 5.07.2021

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, Catherine Corrigan, a Notary Public for the State of North Carolina, County of Brunswick, do hereby certify that Nick Cassala personally appeared before me this 11 day of May, 2021, and acknowledge the due execution of the forgoing infiltration trench maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires Dec 10, 2023