River Marsh – Pembroke MA
Comprehensive Permit Application

Town of Pembroke, Massachusetts
ZONING BOARD OF APPEALS

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RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLICATION

TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

Frederick Casavant IV, Chairman
Pembroke Zoning Board of Appeals
100 Center Street
Pembroke, MA 02359

RE: APPLICATION FOR COMPREHENSIVE PERMIT

Dear Mr. Casavant:

River Marsh LLC, (the “Applicant”) hereby submits this application to the Zoning Board of Appeals of the Town of Pembroke, Massachusetts, for the issuance of a Comprehensive Permit authorizing the Applicant to construct a 56 condominium unit, for-sale, housing development to be called River Marsh.

This Application fulfills the submission requirements set forth in Chapter 40B and the Town of Pembroke Board of Appeals Rules and Regulations for Comprehensive Permits (the “Rules and Regulations”).

The applicant looks forward to the commencement of the Public Hearing within Thirty (30) Days of the Board’s Receipt of this Application.

Sincerely,

[Signature]
Brian P. Murphy,
River Marsh LLC
By its Attorney
River Marsh LLC

DEVELOPMENT NARRATIVE

The Developers have created the entity known as River Marsh LLC for the sole purpose of developing River Marsh, a multi-family housing development in accordance with M.G.L 40B, §20-23. This entity shall execute a Regulatory Agreement to be entered into by and between itself, the community, and the lender, thereby creating a “Limited Dividend Organization.”

The Town of Pembroke is a suburban community with an affluent and historical residential character. It is bordered by Norwell to the north, Marshfield to the northeast, Duxbury to the east, Kingston to the southeast, Plympton to the south, Halifax to the southwest, Hanson to the west, and Hanover to the northwest. Pembroke is in a convenient location at approximately 12 miles east of Brockton, 13 miles northwest of Plymouth, and 27 miles southeast of Boston.

The total land area of Pembroke is 23.5 square miles with a population of 17,837 at the 2010 Census. According to the Development of Housing and Community Development’s 2017 Ch 40B subsidized Housing Inventory, the Town of Pembroke has 6,477 year-round housing units, with 771 units included in its subsidized Housing Inventory for a total of 9.5% of its housing stock.

Existing Site Conditions are shown on the Assessor’s map E-15-17A and map E15-17. The site is located between the North River to the west and Water Street, at the intersection of Church Street (Route 139) to the east in Pembroke, Massachusetts.

Virtually the entire site is located within the Residence A zoning district and approximately 10,700 feet are in the Business “B” Zoning District. The site is comprised of approximately 49.94 acres where 27 acres of which are wetlands occupying the western portion of the parcel. No improvements have been made to the land. The undeveloped area is partially wooded and partially cleared with grass cover. The topography of the site is varied with elevation range from 30’ along the eastern boundary of the parcel of 5’ mean sea level (MSL) at the natural riverbank of the North River. The soil types as identified by the USDA Natural Resources Conservation Service (NRCS) for Plymouth County are classified as Scarborough, Ipswich, Squamscott, Eldridge, Hinckley, Merrimac, Windsoor and Deerfield soils. The soils range in hydrological soil group classifications from ‘A’ to ‘D’.

Water Street is a two-lane town owned roadway with a 45’ Right of Way along the frontage of the site. The Town of Pembroke Magoun Cemetery is on Water Street across from the proposed entrance to the property. The entrance to the site is approximately 300’ from the intersection of Water Street and Route 139. From the intersection of Water Street and Route 139, one can travel along Route 139 from less than 1 mile to Exit 12, Route 3 in Pembroke. The Norwell town line is
immediately north of the site, Marshfield is approximately 1 mile to the east and Duxbury is approximately 2 miles to the southeast.

**Affordability Component**

We are proposing that twenty five (25%) percent, or 14 units, will be identified as affordable units and will blend with the proposed market rate homes and will be evenly distributed throughout the development. The affordable homes will be marketed to households whose income does not exceed eighty (80%) percent of the area median income, as defined by the Department of Housing and Urban Development.

The sale price for the affordable homes shall be calculated assuming a down payment of five (5%) percent of the approved sales price with a total payment for principal, interest, mortgage insurance premiums, property taxes, property insurance and condominium association fees, if any, not exceed thirty (30%) percent, of a household whose income is seventy (70%) percent of the area median income. Using the above formula and based on the more recent median income as published by HUD, the sales price for the affordable units will be approximately $180,000.

It is intended that the residents of Pembroke will receive a preference for up to seventy (70%) percent of the affordable units (70% of 14 units is 10). Preference can be determined, regulated and coordinated by the Developer, monitoring agent and the community to include existing local residents, siblings, parents, and offspring of local residents, in addition to municipal workers.
RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLCIATION

TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

RE: PRELIMINARY SITE DEVELOPMENT PLANS

In Accordance with the Town of Pembroke Rules, the following preliminary plans and drawings are provided (the “Comprehensive Permit Preliminary Site Plan”) and such plans are incorporated into and made a part of this application:

- Narrative Project Description
- Existing Conditions Plan, EX-1
- Preliminary Site Layout Plan, C-1
- Preliminary Grading & Drainage Plan, C-2
- Preliminary Utility Plan, C-3
- Construction Details Sheet 1 of 4, C-4
- Construction Details Sheet 2 of 4, C-5
- Construction Details Sheet 3 of 4, C-6
- Construction Details Sheet 4 of 4, C-7

Proposed Project

The proposed development will consist of 56 non-age restricted condominium units comprised of 3, 4 and 5 unit buildings with bituminous concrete access driveways and associated infrastructure. Visitor and guest parking will be dispersed throughout the site. Access to the site will be provided by a private 18 ft wide roadway entering from Water Street.

The condominiums have been designed by Axiom Architects and range in square footage from 1,900 to 2,200 square feet. We believe that the buildings will blend with the neighborhood and the town of Pembroke as a whole.

The project will access the utility infrastructure located on Water Street, including water, electric, telephone, gas and cable television. A wastewater collection system will be constructed to convey sewerage flows to an on-site wastewater treatment system. The storm water management system will be designed to fully comply with all the standards of the Department of Environmental Protection’s Stormwater Management Policy.
RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLICATION

TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

RE: REPORT ON EXISTING CONDITIONS

In accordance with the Town of Pembroke Rules, the existing conditions at the site are documented in the Comprehensive Permit Plan Set at Tab 2, including the Existing Conditions Plans EX-1 and the Preliminary Grading and Drainage Plan C-2, the Drainage Calculations and Stormwater Management Plan dated September 7, 2018 referenced at Tab 4 and submitted electronically, and in the report attached hereto.
River Marsh Village Development, Pembroke, MA  
(Assessor's Map E-17 Lot 0 & E-17A Lot 274)

EXISTING CONDITIONS

The River Marsh Village site consists of approximately 49.94 acres of land located between the North River to the west and Water Street, at the intersection of Church Street (Route 139) to the east in Pembroke, Massachusetts. Virtually the entire site is within the Residence “A” Zoning District. Access to the site is from the east off Water Street and through the Business “B” Zoning District. Approximately 10,700 +/- square feet are in the Business “B” Zoning District. Within less than one mile east of the property, is an Industrial Zone ‘B’ developed area, which abuts Pilgrims Highway (Massachusetts State Route 3). Homes within the immediate area are generally colonial-style, wooded-framed structures.

The parcel is partially wooded and partially cleared with grass cover and wetlands toward the west side of the site approaching the North River. No improvements have been made to the land. The topography of the site is varied with elevations range from 30’ along the eastern boundary of the parcel of 5’ mean sea level (MSL) at the natural riverbank of the North River. Slopes vary from gentle to somewhat steeper grades sloping toward the wetlands on the west side of the site. The soil types as identified by the USDA Natural Resources Conservation Service (NRCS) for Plymouth County are classified as Scarborough, Ipswich, Squamscott, Eldridge, Hinckley, Merrimac, Windsor and Deerfield soils. The soils range in hydrological soil group classifications from 'A' to 'D'. In addition to the NRCS information, subsurface exploration has been conducted by R.H. Cole & Associate in July of 1992 and September of 1993. The deep observation holes revealed primarily fine to coarse sand (HSG A) throughout the upland areas of the site.

Wetlands occupy approximately 27 acres along the western portion of the parcel. The Pembroke Conservation Commission has confirmed the wetland resource area by issuance of an Order of Resource Area Delineation dated June 3, 2003 for DEP File #SE 56-732. The site is located within Zone AE and Zone X of the Flood Insurance Rate Map, as shown on the current FEMA Flood Insurance Rate Map Panel Nos. 25023C0206J and 25023C0207J with an effective date of July 17, 2012.

Runoff from the site generally flows in two (2) directions: to the northwest towards a low area on the site and west toward the River. There is an 8” CI water main in Water Street at the entrance to the site. Soils on the upland portions of the parcel consist primarily of sand with pockets of silt and gravel.

Water Street is a two-lane town owned roadway with a 45’ Right of Way along the frontage of the site. The Town of Pembroke Magoun Cemetery is on Water Street across from the proposed entrance to the property. The entrance to the site is approximately 300’ from the intersection of Water Street and Route 139. From the intersection of Water Street and Route 139 one can travel along Route 139 for less than 1 mile to Exit 12, Route 3 in Pembroke. The Norwell town line is immediately north of the site, Marshfield is approximately 1 mile to the east and Duxbury is approximately 2 miles to the southeast.
RE: DRAINAGE CALCULATIONS

In accordance with the Town of Pembroke Rules, Drainage Calculations and Stormwater Management Plan dated September 7, 2018 are provided electronically due to size of the plan, and such plan is incorporated into and made part of this application.
RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLICATION
TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

RE: PRELIMINARY SCALED ARCHITECTURAL DRAWINGS

In accordance with the Town of Pembroke Rules, preliminary scaled architectural drawings for each building including typical floor plans, typical elevations and sections, and identifying construction type and typical materials specifications and exterior finish are provided (the “Comprehensive Permit Preliminary Architectural Plan”), and such plans are incorporated into and made part of this application:

Architectural Description

The proposed buildings are designed with pitched roofs that are no more than two stories high. However, the buildings are scaled down to emulate a similar massing to the single-family homes in the surrounding neighborhood, which are all one and two story wood framed buildings. This is accomplished by presenting varying single story rooflines across the entire front and rear of each building.

On the front there is a one story porch adjoining a projecting single story pitched garage roof. The garage is integrated into the front elevation to provide an ease of access while minimizing the need for excessing paved surfaces. The scale of the garage is visually reduced with the layering of roof lines on the front elevation of the homes. The second story front bedroom dormers are each 16’ wide with gables facing the street presenting a varied second story roofline.

The rear elevations are one story with second story dormers facing the back of the building. A half-story clerestory window in the first floor family room of each unit breaks up the roof line. The exterior finishes of the buildings are also selected from typical New England residential materials to blend with the surrounding neighborhood. To give the project some variety, the siding may vary slightly in color, orientation, exposure or possibly between painted clapboards and solid-stained wood shingles. The trim will be typical painted wood rakes, casings, fascia, etc. Roofing will be a single color of architectural asphalt shingles typical throughout. Windows will be white, weather resistant double hung fenestrations with 6/6 mounting patterns to blend with the colonial character of Pembroke. Foundations will be concrete but reduced as low as feasible to the grade to minimize visual appearance. Entry porches will be stone or a similar cultured product and exterior columns, decks and railings will be a combination of wood and/or composite materials for increased durability and longevity of appearance.
RE:  TABULATION OF PROPOSED BUILDINGS

In accordance with the Town of Pembroke Rules, a tabulation of proposed buildings by type, size (number of bedrooms, floor area) and ground coverage, and a summary showing the percentage of the tract to be occupied by buildings, by parking, and other paved vehicular areas, and by open areas is provided below.

The following Tabulation is provided in accordance with the Town of Pembroke’s Supplemental Rules for Comprehensive Permit:

<table>
<thead>
<tr>
<th>Type of Building</th>
<th>1.5 Story Residential Townhomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Buildings</td>
<td>14</td>
</tr>
<tr>
<td>Building Size</td>
<td>1,900-2,200 Square Feet / Unit</td>
</tr>
<tr>
<td>Number of Units</td>
<td>56</td>
</tr>
<tr>
<td>Size of Units</td>
<td>(11) 2 Bedroom Units - 1,900 Square Feet (45) 3 Bedroom Units - 2,100 Square Feet</td>
</tr>
<tr>
<td>Parking Coverage (includes road) (acres and as % of Site)</td>
<td>2.52 acres – 5%</td>
</tr>
<tr>
<td>Other Paved Areas (acres and as % of Site)</td>
<td>2.24 acres – See above</td>
</tr>
<tr>
<td>Open Space (acres and as % of Site)</td>
<td>44.14 acres – 90.2%</td>
</tr>
<tr>
<td>Upland Open Space (acres and as % of Site)</td>
<td>16.73 acres – 34.2%</td>
</tr>
<tr>
<td>Total Impervious area on Site (acres and as % of Site)</td>
<td>4.76 acres – 9.73%</td>
</tr>
</tbody>
</table>

% of Coverage calculations based on total size of 48.9 acres.
RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLICATION

TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

RE: PROJECT ELIGIBILITY

In accordance with the Town of Pembroke Rules and Regulations for Comprehensive Permits, Mass Housing’s preliminary determination of Project Eligibility under the Comprehensive Permit Rules (the “Project Eligibility Determination”) is provided and is incorporated into and made part of this application, together with the following enclosures:

1. Evidence of Limited Dividend Organization
2. Project Eligibility/Site Approval Letter
3. Site Control: Purchase & Sale Agreements
4. Application Materials submitted to MassHousing
The Commonwealth of Massachusetts
William Francis Galvin
Secretary of the Commonwealth, Corporations Division
One Ashburton Place, 17th floor
Boston, MA 02108-1512
Telephone: (617) 727-9640

Certificate of Organization
(Filed by Applicant)

Identification Number: 001243831

1. The exact name of the limited liability company is: RIVER MARSH LLC

2a. Location of its principal office:
No. and Street: 293 WASHINGTON STREET
City or Town: NORWELL State: MA Zip: 02061 Country: USA

2b. Street address of the office in the Commonwealth at which the records will be maintained:
No. and Street: 293 WASHINGTON STREET
City or Town: NORWELL State: MA Zip: 02061 Country: USA

3. The general character of business, and if the limited liability company is organized to render professional service, the service to be rendered:
THE BUSINESS OF THE LLC IS TO ACQUIRE AND DEVELOP CERTAIN LAND IN PEMBROKE, MASSACHUSETTS IN COMPLIANCE WITH THE REQUIREMENTS OF G.L. C. 40B, §§ 20-23 AND THE REGULATIONS PROMULGATED THEREUNDER AND TO OTHERWISE CONDUCT ANY LAWFUL BUSINESS OR ENGAGE IN ANY LAWFUL ACTIVITY PERMITTED BY THE ACT.

4. The latest date of dissolution, if specified:

5. Name and address of the Resident Agent:
Name: BRIAN P. MURPHY
No. and Street: 293 WASHINGTON STREET
City or Town: NORWELL State: MA Zip: 02061 Country: USA

1. BRIAN P. MURPHY resident agent of the above limited liability company, consent to my appointment as the resident agent of the above limited liability company pursuant to G. L. Chapter 156C Section 12.

6. The name and business address of each manager, if any:

<table>
<thead>
<tr>
<th>Title</th>
<th>Individual Name</th>
<th>Address (no PO Box)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MANAGER</td>
<td>BRIAN P. MURPHY</td>
<td>293 WASHINGTON STREET NORWELL, MA 02061 USA</td>
</tr>
</tbody>
</table>

7. The name and business address of the person(s) in addition to the manager(s), authorized to execute documents to be filed with the Corporations Division, and at least one person shall be named if there are no managers.

<table>
<thead>
<tr>
<th>Title</th>
<th>Individual Name</th>
<th>Address (no PO Box)</th>
</tr>
</thead>
</table>
8. The name and business address of the person(s) authorized to execute, acknowledge, deliver and record any recordable instrument purporting to affect an interest in real property:

<table>
<thead>
<tr>
<th>Title</th>
<th>Individual Name</th>
<th>Address (no PO Box)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REAL PROPERTY</td>
<td>BRIAN P. MURPHY</td>
<td>283 WASHINGTON STREET</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NORWELL, MA 02061 USA</td>
</tr>
</tbody>
</table>

9. Additional matters:

SIGNED UNDER THE PENALTIES OF PERJURY, this 13 Day of October, 2016,
BRIAN P. MURPHY
(The certificate must be signed by the person forming the LLC.)
THE COMMONWEALTH OF MASSACHUSETTS

I hereby certify that, upon examination of this document, duly submitted to me, it appears that the provisions of the General Laws relative to corporations have been complied with, and I hereby approve said articles; and the filing fee having been paid, said articles are deemed to have been filed with me on:

October 13, 2016 03:03 PM

WILLIAM FRANCIS GALVIN

Secretary of the Commonwealth
WE ASSIGNED YOU AN EMPLOYER IDENTIFICATION NUMBER

Thank you for applying for an Employer Identification Number (EIN). We assigned you EIN 81-4571204. This EIN will identify you, your business accounts, tax returns, and documents, even if you have no employees. Please keep this notice in your permanent records.

When filing tax documents, payments, and related correspondence, it is very important that you use your EIN and complete name and address exactly as shown above. Any variation may cause a delay in processing, result in incorrect information in your account, or even cause you to be assigned more than one EIN. If the information is not correct as shown above, please make the correction using the attached tear off stub and return it to us.

Based on the information received from you or your representative, you must file the following form(s) by the date(s) shown.

Form 1065 03/15/2017

If you have questions about the form(s) or the due date(s) shown, you can call us at the phone number or write to us at the address shown at the top of this notice. If you need help in determining your annual accounting period (tax year), see Publication 538, Accounting Periods and Methods.

We assigned you a tax classification based on information obtained from you or your representative. It is not a legal determination of your tax classification, and is not binding on the IRS. If you want a legal determination of your tax classification, you may request a private letter ruling from the IRS under the guidelines in Revenue Procedure 2004-1, 2004-1 I.R.B. 1 (or superseding Revenue Procedure for the year at issue). Note: Certain tax classification elections can be requested by filing Form 8832, Entity Classification Election. See Form 8832 and its instructions for additional information.

A limited liability company (LLC) may file Form 8832, Entity Classification Election, and elect to be classified as an association taxable as a corporation. If the LLC is eligible to be treated as a corporation that meets certain tests and it will be electing S corporation status, it must timely file Form 2553, Election by a Small Business Corporation. The LLC will be treated as a corporation as of the effective date of the S corporation election and does not need to file Form 8832.

To obtain tax forms and publications, including those referenced in this notice, visit our Web site at www.irs.gov. If you do not have access to the Internet, call 1-800-829-3676 (TTY/TDD 1-800-829-4059) or visit your local IRS office.
IMPORTANT REMINDERS:

* Keep a copy of this notice in your permanent records. This notice is issued only once and the IRS will not be able to generate a duplicate copy for you. You may give a copy of this document to anyone asking for proof of your EIN.

* Use this EIN and your name exactly as they appear at the top of this notice on all your federal tax forms.

* Refer to this EIN on your tax-related correspondence and documents.

If you have questions about your EIN, you can call us at the phone number or write to us at the address shown at the top of this notice. If you write, please tear off the stub at the bottom of this notice and send it along with your letter. If you do not need to write us, do not complete and return the stub.

Your name control associated with this EIN is RIVE. You will need to provide this information, along with your EIN, if you file your returns electronically.

Thank you for your cooperation.

Keep this part for your records. CP 575 B (Rev. 7-2007).

Return this part with any correspondence so we may identify your account. Please correct any errors in your name or address.

Your Telephone Number

( )

DATE OF THIS NOTICE: 12-02-2016

EMPLOYER IDENTIFICATION NUMBER: 81-4571204

FORM: SS-4

NOBOD

INTERNAL REVENUE SERVICE
CINCINNATI OH 45999-0023

RIVER MARSH LLC
BRIAN P MURPHY MBR
233 WASHINGTON ST
NORWELL, MA 02061
February 15, 2013

River Marsh, LLC
Brian Murphy
299 Washington Street
Nantucket, MA 02554

Re: River Marsh:
Project Eligibility/Site Approval
MassHousing ID No. 916

Dear Mr. Murphy:

This letter is in response to your application as "Applicant" for a determination of Project Eligibility (Site Approval) pursuant to Massachusetts General Laws Chapter 40B ("Chapter 40B"), 760 CMR 56.00 (the "Regulations") and the Comprehensive Permit Guidelines issued by the Department of Housing and Community Development ("DHCD"); the "Guidelines" and, collectively with Chapter 40B and the Regulations, the "Comprehensive Permit Rules"; under the New England Fund ("NEF") Program ("the Program") of the Federal Home Loan Bank of Boston ("FHLBB").

You have proposed to build fifty-six (56) condominiums (the "Project") on 42.94 acres of land located on Water Street (the "Site") in Falmouth (the "Municipality").

In accordance with the Comprehensive Permit Rules, this letter is intended to be a written determination of Project Eligibility by MassHousing acting as Subsidizing Agency under the Guidelines, including Part V thereof: Housing Programs in Which Funding Is Provided By Other Than A State Agency.

MassHousing has performed an on-site inspection of the Site which local boards and officials were invited to attend, and has reviewed the pertinent information for the Project submitted by the Applicant, the Municipality and others in accordance with the Comprehensive Permit Rules.

Municipal Comments
Pursuant to the Regulations, the Municipality was given thirty (30) days period in which to review the site approval application and submit comments to MassHousing. In response to a request from the Falmouth Board of Selectmen, this review period was extended to sixty (60) days. The Board of Selectmen provided an initial comment letter dated February 27, 2013, identifying numerous concerns with the Project, and urging MassHousing to deny the Application for Site Approval.

[Signatures]

Charles D. Baker, Governor
Michael J. Dukakis, Chairman
[Signature]
[Signature]
On July 26, 2017, MassHousing and the Municipality received revised site plans from the applicant, showing modifications made by the Applicant in response to feedback from MassHousing and the Municipality regarding the site layout and building design. The number of units was reduced from sixty-eight (68) units to fifty-six (56) units, and residents were moved to the original site plan, including the removal of proposed housing structures from the portion of the site closest to the North River and pulling those units farther away from areas subject to review under the Wetlands Protection Act.

Following receipt of the revised Site Plan, the Pembroke Board of Selectmen asked for an additional thirty (30) days to review the revised plans. On August 25, 2017, MassHousing received a second comment letter from the Pembroke Board of Selectmen stating that the revised Site Plan is slightly smaller and less obstructive, but that they remained in opposition to the Project, and reaffirming that all of the comments included in the initial comment letter remained unchanged.

The following concerns were identified in their comments:

- The Selectmen’s letter emphasized that part of the Site sits in extremely sensitive wetlands, and as such any development of the Site must be designed to protect the surrounding wetlands and ensure that the species of animals and plants found in the area are protected. They emphasized that the Project’s stormwater collection and treatment system must prevent erosion and contamination to the nearby North River both during and after construction. They questioned the impact of a significant amount of new impervious surfaces (buildings and paved sites) on groundwater recharge patterns in this area.

- The Selectmen expressed concern about the additional traffic that would be generated by the Project, and associated safety impacts on area roadways and intersections, particularly the intersections at Water Street and Route 139. Pedestrian safety was also identified as a concern in light of the lack of sidewalks in this area.

- The Selectmen also provided comments from the Pembroke Fire Department. The Fire Department emphasized that the Project must be designed so as to ensure the maximum level of emergency access and fire protection. They outlined a variety of requirements for the Project including fire lanes, sufficient roadway widths and intersection radii to accommodate public safety vehicles, hydrants and interior fire suppression systems.

- Pembroke Selectmen expressed concern about the sufficiency of the existing water supply and encouraged the implementation of water-saving facilities at the Project.

Community Comments

In addition to the comments from town officials, MassHousing received several letters and signed petitions from area residents, all of which expressed opposition to the proposed Project. Although letters from members of the community basically echoed the concerns identified by the local officials, the letters received are summarized below:

- Area residents expressed concern about potentially negative environmental impacts of the Project. They noted that portions of the Site have historically experienced flooding and expressed concern that Project grading could result in erosion and flooding impacts on adjacent properties. In addition, they are concerned that the Site supports a large and diverse
wildlife population and that the proposed Project may result in harm to wildlife and its associated habitat.

- Area residents voiced concern with existing traffic congestion on Water Street and the possibility that the Project would exacerbate traffic volumes and further reduce the level of service at area intersections. Letters expressed the concern that increased traffic volume on area roadways would result in unsafe conditions for residents traveling on Route 139.

- Area residents expressed concern that the proposed Project will deplete the groundwater supply.

- Area residents believe the proposed buildings are significantly out of scale within the context of the existing residential neighborhood.

MassHousing received a separate letter from the North & South Rivers Watershed Association Inc., dated August 28, 2017. This letter expressed the opinion that the density of the development threatens to undermine the scenic quality, wildlife habitat, water quality, and environmental health of the site.

MassHousing was also contacted by several State Representatives including Josh Cutler, James Cantwell, Dan Meschino, David DeCosta, and two State Senators, Virgilio deMacedo and Patrick O’Connor. The legislators collectively provided letters dated February 6, 2017 and August 31, 2017, expressing concerns about the proposed development. Representative Cutler and others reiterated constituent concerns about the potential impacts of the Project on area traffic, wetlands and natural resources and recommended that MassHousing not issue a Project Eligibility letter for this proposed Project.

MassHousing has carefully considered all municipal concerns and, to the extent possible within the context of the Approval, has offered responses in the “recommendations” section of this letter. It is anticipated that the Municipality, through the comprehensive permit process, will thoroughly review the Project proposal and identify all conditions necessary to ensure consistency with “local needs” as defined in M.G.L. Chapter 40B, Section 20.

MassHousing Determination and Recommendations

MassHousing staff has determined that the Project appears generally eligible under the requirements of the Program, subject to final review of eligibility and to Final Approval. As a result of our review, we have made the findings as required pursuant to 760 CMR 56.04(1) and (4). Each such finding, with supporting reasoning, is set forth in further detail on Attachment I hereto.

Based on MassHousing’s site and design review, and in light of feedback received from the Municipality, the following issues should be addressed in your application to the Zoning Board of Appeals, and you should be prepared to explore them more fully during the public hearing process:

- Development of this site will require resolution of all environmental conditions per laws, regulations and standards applicable to existing conditions and to the proposed use, including but not limited to compliance with all applicable statutory and regulatory restrictions relating to floodplain management, the protection of wetlands, river and wildlife habitats, conservation areas, as well as local and state environmental protection requirements.
relating to the protection of the public water supply, stormwater runoff, wastewater treatment, and hazardous waste safety. The Applicant should provide evidence of such compliance prior to the issuance of a building permit for the Project.

- Plans for the Project must comply with all conditions contained in any Order of Conditions issued by the Conservation Commission or the Department of Environmental Protection in connection with the Project.

- The Applicant must comply with Title V regulations regarding the design and construction of individual wells, septic systems, and wastewater treatment plants. The Applicant should provide evidence of such compliance prior to the issuance of a building permit for the Project.

- The Applicant should be prepared to provide a detailed traffic study assessing potential impacts of the Project on site roadways, including traffic volumes, on-site rates, and the safety and level of service (LOS) of access intersections, and identifying appropriate traffic mitigation in compliance with all applicable state and local requirements governing site design.

- The traffic study or other professional site design process should address proposed on-site circulation and parking to ensure compliance with public safety standards and good design practices relative to drive-alternate widths, turning radius and sight distances along the site drive and the parking area through which it passes. The Applicant should be prepared to address concerns about provisions for safe pedestrian access and pedestrian/vehicular separation within the site, sufficiency of resident and guest parking, and plans for snow storage.

- The Applicant should be prepared to provide detailed information relative to proposed waste use, potential impacts on existing capacity, and appropriate mitigation.

- A landscape plan should be provided to address municipal concerns, including a detailed planting plan as well as paving, lighting, and signage details and the location of outdoor dumpsters or other waste receptacles.

This Site Approval is expressly limited to the development of no more than fifty-six (56) homeowner-occupied units under the terms of the Program, of which not less than fourteen (14) of such units shall be restricted as affordable for low or moderate-income persons or families as required under the terms of the Guidelines. It is not a commitment or guarantee of financing, and it does not constitute a site plan or building design approval. Should you consider, prior to obtaining a Comprehensive Permit, the use of any other housing subsidy program, the construction of additional units or a reduction in the size of the site, you may be required to submit a new Site Approval application for review by MassHousing. Should you consider a change in tenure or a change in building type or height, you may be required to submit a new site approval application for review by MassHousing.

For guidance on the Comprehensive Permit review process, you are advised to consult the Guidelines. Further, we urge you to review carefully with legal counsel the M.G.L. c.40B Comprehensive Permit Regulations at 760 CMR 56.00.
This approval will be effective for a period of two (2) years from the date of this letter. Should the Applicant not apply for a Comprehensive Permit within this period or should MassHousing not extend the effective period of this letter in writing, this letter shall be considered to have expired and no longer be in effect. In addition, the Applicant is required to notify MassHousing of the following times throughout this two-year period: (1) when the Applicant applies to the local ZBA for a Comprehensive Permit, (2) when the ZBA issues a decision and (3) if applicable, when any appeals are filed.

Should a Comprehensive Permit be issued, please note that prior to (i) commencement of construction of the Project or (ii) issuance of a building permit, the Applicant is required to submit to MassHousing a request for Final Approval of the Project (as it may have been amended) in accordance with the Comprehensive Permit Rules (see especially 760 CMR 56.04(07) and the Guidelines including, without limitation, Part III thereof concerning Affirmative Fair Housing Marketing and Resident Selection). Final Approval will not be issued unless MassHousing is able to make the same findings at the time of issuing Final Approval as required at Site Approval.

Please note that MassHousing may not issue Final Approval if the Comprehensive Permit contains any conditions that are inconsistent with the regulatory requirements of the New England Fund Program of the NHLBB, for which MassHousing serves as Subsidizing Agency, as reflected in the applicable regulatory documents. In the interest of providing for an efficient review process and in order to avoid the potential lapse of certain appeal rights, the Applicant may wish to submit a “final draft” of the Comprehensive Permit to MassHousing for review. Applicants who avail themselves of this opportunity may avoid significant procedural delays that may result from the need to seek modification of the Comprehensive Permit after its initial issuance.

If you have any questions concerning this letter, please contact Michael Busby at (617) 854-1239.

Sincerely,

Thomas J. Lyons
Acting Executive Director

cc: Crystal Komogay, Undersecretary, DHCD
The Honorable Virgil M. deMacedo, State Senator
The Honorable Josh S. Cutler, State Representative
Willard J. Boulte, Jr., Chairman, Board of Selectmen
William Cullity, Chairman, Zoning Board of Appeals
Attachment I

760 CMR 56.04 Project Eligibility; Other Responsibilities of Subsidizing Agency
Section (c) Findings and Determinations

River Marsh, Project #916

After the close of a 30-day review period and extensions, MassHousing hereby makes the following findings, based upon its review of the application, and in consideration of information received during the site visit and from written comments:

(a) that the proposed Project appears generally eligible under the requirements of the housing subsidy program, subject to final approval under 760 CMR 56.04(7);

The Project is eligible under the NEF housing subsidy program and at least 25% of the units will be available to households earning at or below 50% of the Area Median Income (AMI), adjusted for household size, as published by the U.S. Department of Housing and Urban Development ("HUD"). The most recent HUD income limits indicate that 80% of the current applicable median income for a four-person household in Pembroke is $78,156. A letter of interest was provided by South Shore Bank, a member bank of the Federal Home Loan Bank of Boston.

(b) that the site of the proposed Project is generally appropriate for residential development, taking into consideration information provided by the Municipality or other parties regarding municipal actions previously taken to meet affordable housing needs, such as inclusionary zoning, multifamily districts adopted under c.40A, and overlay districts adopted under c.40B, (such findings, with supporting reasoning, to be set forth in reasonable detail);

The Town of Pembroke does not have a DHCD approved Housing Production Plan. According to DHCD's Chapter 40B Subsidized Housing Inventory (SHI), updated through December 5, 2017, Pembroke has 625 SHI units (9.0% of its housing inventory) and needs 23 additional SHI units in order to meet the 10% SHI threshold. The current zoning for the subject site allows for residential use, and the proposed residential development would be compatible with surrounding uses.

(c) that the conceptual project design is generally appropriate for the site on which it is located, taking into consideration factors that may include proposed uses, conceptual site plan and building massing, topography, environmental resources, and integration into existing development patterns (such findings, with supporting reasoning, to be set forth in reasonable detail);

Based on a site inspection by MassHousing staff, internal discussions, and a thorough review of the application, MassHousing finds that the Site is suitable for residential use and development and that such use would be compatible with surrounding uses, and would directly address the local need for housing.

It should be noted that the proposed site plan for River Marsh included in the original submission to MassHousing on January 14, 2017 was significantly redesigned by the Applicant in response to feedback received from the community and MassHousing during the initial review process.
It is also important to note that the changes contained within the current version of the plan address specific issues that were the subject of a previous denial of a Project Eligibility Application by MassHousing for a similar project on the same Site dated September 9, 2005. Specifically, the revised plan has responded to the concerns raised about units located in close proximity to the North River and impacting both wetland and flood-sensitive resource areas. The revised plan, which reduced the number of proposed units from 68 to 56, eliminated the need for a wetland crossing. This significant change to the Project will mitigate impacts on nearby wetlands and result in an enhanced river corridor buffer, over and above the 300-foot setback established by the North River Protective Act.

Additionally, the Project benefits from means of access and egress that were not considered as part of the 2005 plan. The Site now features two (2) points of access and egress. Vehicles may connect to Route 139 east and the nearby Route 3 interchange via Cross Street. This alternative improves safety by reducing the need for vehicles to connect to Route 139 east via a left turn from Water Street.

Many comments from local officials, legislative stakeholders, and residents questioned the anticipated impacts of the conceptual project design, especially with respect to traffic, stormwater management, wetlands protection, and septic system performance. These are all critical areas of local concern and are addressed within the Conceptual Project Design proposal to address concerns on the 408 developers that safeguard local health and safety concerns. MassHousing expects the Applicant to engage Pembroke's Zoning Board of Appeals in a collaborative manner on all areas of local concern.

The following site plan review findings are made in response to the modified conceptual site plan:

**Relationship to Adjacent Building Typology (including building massing, site arrangement, and architectural details):**

The surrounding neighborhood is generally residential in character and is predominantly made up of single-family homes. The Developer intends to build 8-story, multi-unit, townhouse-style residential buildings. The design of the Project will be mitigated by the effects of the proposed neighborhood structures to create an appropriate transition to adjoining neighborhoods.

**Relationship to Adjacent Streets**

The site is located in a suburban residential neighborhood in North Pembroke, approximately .75 miles west of Exit 12 on Route 3 and .5 miles north of Route 139, close to the Marshfield and Hanover town lines. There appears to be adequate lines of sight for vehicles entering and exiting the proposed Site. In addition, the Applicant has proposed a secondary means of access/egress onto Water Street that provides an alternative route to Route 139 and Route 3.

**Density**

The Applicant proposes to build 56 townhouse condominiums on 49.94 acres, of which approximately 18.54 acres are buildable. The resulting density is 3.02 units per buildable acre, which is acceptable given the proposed housing type and the uses found in the surrounding context.

**Conceptual Site Plan**

The Developer has taken into consideration the site constraints, wetlands and topographical features of the Site to provide safe access and egress for future residents. The Site consists of 49.94 acres of
land; and 18.54 acres are buildable. The site plan largely concentrates development at the site's central core, leaving large vegetated open areas and some uplands undeveloped. The homes will be clustered together in several areas to create a village-style community and allow for the use of a proposed common sewage disposal system. The wetland resources and the nearby North River are predominant features of the site that may create open space opportunities, such as walking trails and ecological loading activities.

Topography
The subject property is gently rolling with slight variations in grade where the wetlands are located. The site is characterized by numerous wetland areas. The topographic features of the site have been considered in relationship to the proposed project plans and do not constitute an impediment to development of the site.

Environmental Resources
The site is a large piece with extensive natural resource and undisturbed wetland areas. Extensive wetlands found throughout the site will limit the development to upland areas identified by the developer. Development of the site will require careful attention to current best management practices to avoid any adverse impacts to the protected wetland resource areas. These resource areas will ultimately serve to break down the perceived massing of the site, provide visual screening, and surround the residential portions of the site with natural features. Wetland resources in these areas will be reviewed further review by the local Conservation Commission under a Notice of Intent.

(ii) that the proposed project appears financially feasible within the housing market in which it will be situated (based on comparable sales or sales figures);

The project appears financially feasible based on a comparison of market sales submitted by the Applicant.

(iii) that MassHousing finds that an initial pro forma has been reviewed, including a land valuation determination consistent with the Department's Guidelines, and the project appears financially feasible and consistent with the Department's Guidelines for Cost Examination and Limitations on Profits and Distribution (if applicable) on the basis of estimated development costs;

The initial pro forma has been reviewed for the proposed residential use, and the project appears financially feasible with a projected profit margin of 13.73%. In addition, a third-party appraisal commissioned by MassHousing has determined that the "As Is" land value for the site of the proposed project is $1,130,000.

(iii) that the Applicant is a public agency, a non-profit organization, or a Limited Dividend Organization, and it meets the general eligibility standards of the housing program and

The applicant must be organized as a Limited Dividend Organization prior to applying for Final Approval. MassHousing sees no reason this requirement could not be met given information reviewed to date. The Applicant meets the general eligibility standards of the NEF housing subsidy program and has executed its Acknowledgment of Obligations to restrict its profits in accordance with the applicable limited dividend provisions.
(g) that the Applicant controls the site, based on evidence that the Applicant or a related entity owns the site, or holds an option or contract to acquire such interest in the site, or has such other interest in the site as is deemed by the Sponsoring Agency to be sufficient to control the site.

The Applicant controls the entire 42.94-acre site under a Purchase and Sale agreement with an effective date of August 30, 2021.
PURCHASE AND SALE AGREEMENT

This 5th day of December, 2016

From the Office of:
Warren F. Baker
Baker, Braverman & Barbadoro
300 Crown Colony Drive, Suite 500
Quincy, MA 02169

1. PARTIES AND MAILING ADDRESSES

Red Castle, LLC
Hereinafter collectively called the SELLER, or SELLER's designated nominee, agrees to SELL and

River Marsh LLC or its nominee
hereinafter called the BUYER or PURCHASER, agrees to BUY, upon the terms hereinafter set forth.

2. DESCRIPTION

the following described premises: the real estate known as 274 Water Street, Pembroke, MA 02359 with
Parcel ID E15-17A, depicted on a certain conceptual plan, prepared by McKenzie Engineering
Group and attached hereto, and more particularly described as Lot 1 on a plan entitled "Plan of
Land, Water Street, Pembroke, MA," Scale: 1" = 100', dated May 16, 1985, drawn by Loring H.
Jacobs, Co., duly recorded with Plymouth County Registry of Deeds as Plan Number 570 of 1985 in
Plan Book 25, Page 685, including all easements, restrictions, and rights of way being a part
thereof. For title reference see deed recorded with the Plymouth County Registry of Deeds in
Book 14299, Page 285.

3. BUILDINGS, STRUCTURES, IMPROVEMENTS, FIXTURES

VACANT LAND and a single family residence included in the sale as a part of said premises are the
buildings, structures, and improvements now thereon, and the fixtures belonging to the SELLER and used
in connection therewith.

4. TITLE DEED

Said premises are to be conveyed by a good and sufficient quitclaim deed running to the BUYER, or to the
nominee designated by the BUYER by written notice to the SELLER at least seven (7) days
before the deed is to be delivered as herein provided, and said deed shall convey a good and clear record
and marketable title thereto, free from encumbrances, except:

(a) Provisions of existing building and zoning laws;
(b) Existing rights and obligations in party walls which are not the subject of written agreement;
(c) Such taxes for the then current fiscal year as are not due and payable on the date of the delivery of
such deed;
(d) Betterment assessments after the date of this agreement;
(e) Federal, state and local laws, ordinances, bylaws, rules and regulations relating to the use of land;
and
(f) Easements, restrictions and reservations of record, if any.

5. PLANS

If said deed refers to a plan necessary to be recorded therewith the SELLER shall deliver such plan
with the deed in form adequate for recording or registration.

6. REGISTERED TITLE

In addition to the foregoing, if the title to said premises is registered, said deed shall be in form sufficient
to entitle the BUYER to a Certificate of Title of said premises, and the SELLER shall deliver with said
deed all instruments, if any, necessary to enable the BUYER to obtain such Certificate of Title.

7. PURCHASE PRICE

The agreed purchase price for said premises is

Five Hundred and Fifty Thousand dollars ($550,000.00), of which

$ 1,000.00 ___ to be paid as a deposit herewith,

$ 649,000.00 ___ are to be paid at the time of delivery and recording of the deed in cash, or

$ ____________________________ by certified, cashier's, treasurer's or bank check(s) or attorney client fund

check(s).

$ 550,000.00 ___ TOTAL
8. TIME FOR PERFORMANCE; DELIVERY OF DEED

Such deed is to be delivered at 10:00 a.m. on the at the time as further determined and provided herein at the Plymouth County Registry of Deeds or at the office of the conveyancing attorney provided that the same is within Plymouth County. It is agreed that time is of the essence of this agreement.

9. POSSESSION AND CONDITION OF PREMISE.

Full possession of said premises, free of all tenants and occupants, is to be delivered at the time of the delivery of the deed, said premises to be then (a) in the same condition as they now are, reasonable use and wear thereof excepted, and (b) not in violation of said building and zoning laws, and (c) in compliance with provisions of any instrument referred to in clause 4 hereof. The BUYER shall be entitled personally to inspect said premises prior to the delivery of the deed in order to determine whether the condition thereof conforms with the terms of this clause.

10. EXTENSION TO PERFECT TITLE OR MAKE PREMISES CONFORM

If the SELLER shall be unable to give title or to make conveyance, or to deliver possession of the premises, all as herein stipulated, or if at the time of the delivery of the deed the premises do not conform with the provisions hereof, then the SELLER shall use reasonable efforts, provided that under no circumstances shall reasonable efforts be deemed to require Seller to expend more than $1,000 in the aggregate to remove any defects in title, or to deliver possession as provided herein, or to make the said premises conform to the provisions hereof, as the case may be, in which event, the time for performance hereof shall be extended for a period of thirty (30) days.

11. FAILURE TO PERFECT TITLE OR MAKE PREMISES CONFORM, etc

If at the expiration of the extended time the SELLER shall have failed so to remove any defects in title, deliver possession, or make the premises conform, as the case may be, all as herein agreed, or if at any time during the period of this agreement or any extension thereof, the holder of a mortgage on said premises shall refuse to permit the insurance proceeds, if any, to be used for such purposes, then any payments made under this agreement shall be forthwith refunded and any interest thereon and all other obligations of the parties hereto shall cease and this agreement shall be void without recourse to the parties hereto.

12. BUYER'S ELECTION TO ACCEPT TITLE

The BUYER shall have the election, at either the original or any extended time for performance, to accept such title as the SELLER can deliver to the said premises in their then condition and to pay therefore the purchase price without deduction, in which case the SELLER shall convey such title, except that in the event of such conveyance in accord with the provisions of this clause, if the said premises shall have been damaged by fire or casualty insured against, then the SELLER shall, unless the SELLER has previously restored the premises to their former condition, either:

- (c) pay over or assign to the BUYER, on delivery of the deed, all amounts recovered or recoverable on account of such insurance, less any amounts reasonably expended by the SELLER for any partial restoration, or

- (d) if a holder of a mortgage on said premises shall not permit the insurance proceeds or a part thereof to be used to restore the said premises to their former condition or to be so paid over or assigned, give to the BUYER a credit against the purchase price, on delivery of the deed, equal to said amounts so recovered or recoverable and retained by the holder of the said mortgage less any amounts reasonably expended by the SELLER for any partial restoration.

13. ACCEPTANCE OF DEED

The acceptance of a deed by the BUYER or his nominee as the case may be, shall be deemed to be a full performance and discharge of every agreement and obligation herein contained or expressed, except such as are, by the terms hereof, to be performed after the delivery of said deed.

14. USE OF MONEY TO CLEAR TITLE

To enable the SELLER to make conveyance as herein provided, the SELLER may, at the time of delivery of the deed, use the purchase money or any portion thereof to clear the title of any or all encumbrances or interests, provided that all instruments so procured are recorded simultaneously with the delivery of said deed or thereafter in accordance with accepted practice.

15. INSURANCE

Until the delivery of the deed, the SELLER shall maintain insurance on said premises as follows:

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Amount of Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire and Extended Coverage</td>
<td>As presently insured</td>
</tr>
</tbody>
</table>

16. ADJUSTMENTS

Taxes for the then current fiscal year, shall be apportioned as of the day of performance of this agreement and the net amount thereof shall be added to or deducted from, as the case may be, the purchase price payable by the BUYER at the time of delivery of the deed.
17. ADJUSTMENT OF UNASSESSED AND ABATED TAXES
If the amount of said taxes is not known at the time of the delivery of the deed, they shall be apportioned on the basis of the taxes assessed for the preceding fiscal year, with a reappraisal and if the new tax rate and valuation can be ascertained; and, if the taxes which are to be apportioned shall thereafter be reduced by abatement, the amount of such abatement, less the reasonable cost of obtaining the same, shall be apportioned to the parties, provided that neither party shall be obligated to institute or prosecute proceedings for an abatement unless herein otherwise agreed.

18. BROKER's FEE
A Broker's fee for professional services of N/A

19. BROKER($) WARRANTY
The Broker(s) named herein N/A warrant(s) that the Broker(s) is(are) duly licensed as such by the Commonwealth of Massachusetts.

20. DEPOSIT
All deposits made hereunder shall be held in escrow by Sellers as escrow agent subject to the terms of this agreement and shall be duly accounted for at the time for performance of this agreement. In the event of any disagreement between the parties, the escrow agent may retain all deposits made under this agreement pending instructions mutually given by the SELLER and the BUYER or a Court of competent jurisdiction. Any interest earned on deposit shall be split evenly between BUYER and SELLER at closing.

21. BUYER's DEFAULT; DAMAGES
If the BUYER shall fail to fulfill the BUYER's agreements herein, all deposits made hereunder by the BUYER shall be retained by the SELLER as liquidated damages and this shall be the Seller's sole and exclusive remedy both at law and/or in equity. Claims damages from a breach of BUYER'S obligations hereunder are difficult to ascertain at the time of the signing of this agreement and the parties agree that the amount is a reasonable estimate, at this time, of the SELLER'S expected damages.

22. RELEASE BY HUSBAND OR WIFE
The SELLER's spouse hereby agrees to join in said deed and to release and convey all statutory and other rights and interests in said premises.

23. BROKER AS PARTY
The Broker(s) named herein join(s) in this agreement and become(s) a party hereto, insofar as any provisions of this agreement expressly apply to the Broker(s), and to any amendments or modifications of such provisions to which the Broker(s) agree(s) in writing.

24. LIABILITY OF TRUSTEE, SHAREHOLDER, BENEFICIARY, etc.
If the SELLER or BUYER executes this agreement in a representative or fiduciary capacity, only the principal or the estate represented shall be bound, and neither the SELLER or BUYER so executing, nor any shareholder or beneficiary of any trust, shall be personally liable for any obligation, express or implied, heretofore.

25. WARRANTIES AND REPRESENTATIONS
The BUYER acknowledges that the BUYER has not been influenced to enter into this transaction nor has he relied upon any warranties or representations not set forth or incorporated in this agreement or previously made in writing, except for the following additional warranties and representations, if any, made by either the SELLER or the Broker(s): None. Buyer is purchasing the property in its "AS IS" condition, except as set forth herein.

26. CONSTRUCTION OF AGREEMENT
This instrument, executed in multiple counterparts, is to be construed as a Massachusetts contract, is to take effect as a sealed instrument, sets forth the entire contract between the parties, is binding upon and enures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be cancelled, modified or amended only by a written instrument executed by both the SELLER and the BUYER. If two or more persons are named herein as BUYER their obligations hereunder shall be joint and several. The captions and marginal notes are used only as a matter of convenience and are not to be considered a part of this agreement or to be used in determining the intent of the parties to it.

27. LEAD PAINT LAW
The Buyer acknowledges that Buyer has been informed that under Massachusetts law, whenever a child or children under six years of age resides in any residential premises in which any paint, plaster or other accessible material contains dangerous levels of lead said paint, plaster or other material must be removed so as to make it inaccessible to children under six years of age.

28. SMOKE DETECTORS AND CARBON MONOXIDE
The Buyer waives its right to have Seller, at the time of the delivery of the deed, deliver a certificate from the fire department of the city or town in which said premises are located stating that said premises have been equipped with approved smoke detectors in conformity with applicable law. The Buyer intends to use said property as vacant land.
PROVISIONS

See Rider "A" attached hereto and incorporated herein.

WARNING: This is a legal document that creates binding obligations. If not understood, consult an attorney.

[Signatures]
Red Castle, LLC, SELLER
By: Brian P. Murphy, its Manager

River Marsh LLC, BUYER
By: Brian P. Murphy, its Manager
RIDER A TO PURCHASE AND SALE AGREEMENT

SELLER: Red Castle, LLC
BUYER: River Marsh LLC
PREMISES: Parcel known as 274 Water Street, Pembroke, MA
DATE: December 6, 2016

Notwithstanding anything to the contrary set forth in the Purchase and Sale Agreement, the following provisions are hereby inserted. To the extent the provisions of this Rider A contradict with the terms of the Agreement, the provisions of this Rider A shall be deemed to be superseding.

30. Permit Condition. The obligations of the BUYER hereunder shall be conditioned upon the BUYER obtaining applicable permits, after applicable appeals, for the construction of a so-called 40B project including without limitation all Comprehensive Permits, building permits, Board of Health Permits, Conservation Orders of Conditions required for the construction of such multiunit affordable Housing Project. In the event BUYER is unable to obtain such permits and so notifies the SELLER, on or before January 1, 2021, by mail posted, this agreement shall terminate and all deposits and interest or dividends thereon hereunder shall be returned promptly. BUYER has the authority to file and apply for all necessary applications and permits under this paragraph and will provide copies of same to SELLER in advance for reasonable review and comment. Such notice date shall be automatically extended in the event of any pending appeal or 180 days beyond the granting of all such permits.

31. Notice. Any notice required or permitted under this Agreement shall be in writing delivered by hand or certified mail, return receipt requested (charges pre-paid), posted as of the date required, or by facsimile, to the following:

To the SELLER: Red Castle, LLC
293 Washington St
Norwell, Ma 02061

To the BUYER: River Marsh LLC
293 Washington Street
Norwell, Ma 02061

with a copy to: Warren F. Baker, Esq.
Baker, Braverman & Barbadoro, P.C.
300 Crown Colony Drive, Suite 500
Quincy, MA 02169
(781) 848-9610 (781) 848-9790 (fax)
E-Mail: warrenb@bbb-lawfirm.com
In order to facilitate the execution and delivery of certain documents contemplated hereby, the parties grant to their respective attorneys named above the actual authority to execute and deliver on each party's behalf any (a) agreement modifying the time for the performance of any event hereunder, or (b) any notice that may be given under this Agreement, and the parties may rely upon the signature of such attorneys (including faxed signatures) unless a party has disclaimed the authority granted herein by written notice given to the other party as provided above.

32. Title Provisions. Except as otherwise provided for within this Agreement, in matters respecting title to the premises, standards of the Massachusetts Real Estate Bar Association shall be determinative where applicable.

33. Inspection and Representations. BUYER represents that he has have made a total examination of the Premises, the neighborhood, the surrounding areas, the municipality in which the Premises are located, and all legal issues (excepting title) pertaining to the purchase of the Premises, including without limitation, building code and zoning matters, and after negotiations is purchasing the property and paying the purchase price in accordance with the Agreement based on his assessment and examination of all of the above. BUYER warrants that he shall rely on such examinations, that he is satisfied with the results of such examinations, and that SELLER and BROKER have made no warranties or representations, express or implied, upon which BUYER has relied concerning the condition of the Premises, or other matters referred to above. BUYER further acknowledges that the current condition of the Premises has been considered in establishing the Purchase Price set forth in this Agreement. Without limiting the generality of the foregoing, the parties acknowledge and agree that the Premises shall be sold strictly on an "as is," "where is," and "with all defects" basis, without representation or warranty, express, implied or statutory, of any kind, including, without limitation, representation or warranty as to condition (structural, mechanical or otherwise), construction, compliance with law, habitability, merchantability or fitness for any purpose, all of which are hereby disclaimed and which BUYER hereby waives. The provisions of this paragraph shall survive the delivery of the deed.

34. Entry to Premises. BUYER shall have the right to enter the premises at reasonable times prior to the Closing Date ("Due Diligence Period") for the purposes of showing the property to prospective lenders, for the taking of measurements, or for making reasonable inspections of purpose. BUYER shall indemnify and hold SELLER harmless from all damages, costs, loss, and liability associated with said access. BUYER shall have the right to inspect and examine the Property to the extent BUYER deems necessary in its sole discretion, to determine the condition of the Property and the suitability of the Premises for its development. BUYER's representatives, consultants, agents and employees shall, during regular business hours, (a) have the right to cause complete environmental reviews and site assessments and inspections of the Property to be made, (b) have access to all buildings, improvements, and (c) conduct all other necessary feasibility studies, title reports, surveys, soils tests, ground water tests, engineering studies, examination of zoning status, building and use permits, sign permits and all other permits required for the Property. While conducting such investigations, tests and studies, BUYER shall not unreasonably disturb or interfere the Property. Prior to the expiration of the
Due Diligence Period, BUYER shall notify Seller if BUYER is not satisfied with such investigations and reviews and BUYER shall have the right, in its sole and absolute discretion, to terminate this Agreement and receive a refund of its Deposit, in which event, except as specifically provided otherwise in this Agreement, the parties shall have no further obligations to each other under this Agreement.

35. **Entire Agreement.** This document shall constitute the entire agreement of the parties regarding the subject matter hereof. It may not be altered or amended except by a writing signed by the parties. This instrument, executed in triplicate, is to take effect as a sealed instrument, is binding upon and inures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be canceled, modified or amended only by a written instrument executed by both the SELLER and the BUYER. If two or more persons are named herein as BUYER their obligations hereunder shall be joint and several.

36. **Closing.** The Closing shall occur upon notice to the Sellers by the Buyer on or within 180 from the receipt of all applicable and necessary permits for the construction of the affordable housing development of Buyer’s design and the expiration of all appeal periods without appeal, including without limitation building permits issued by the Town of Pembroke.

**SELLER:**

Red Castle, LLC
By: Brian P. Murphy, its Manager

**BUYER**

River Marsh LLC
By: Brian P. Murphy, its Manager
PURCHASE AND SALE AGREEMENT

This 8th day of December, 2016

From the Office of:
Warren F. Baker
Baker, Braverman & Barbadoro
300 Crown Colony Drive, Suite 500
Quincy, MA 02169

1. PARTIES AND MAILING ADDRESSES

William J. Murphy, Jr., Trustee of Demos Realty Trust u/d/t dated August 29, 1973 recorded in Plymouth County Registry of Deeds, Registered Land Division, Document #155347
Hereinafter collectively called the SELLER, or SELLER's designated nominee, agrees to SELL and
River Marsh LLC or its nominee, hereinafter called the BUYER or PURCHASER, agrees to BUY, upon the terms hereinafter set forth,

2. DESCRIPTION

the following described premises: the real estate located off of the westerly side of Water Street, Pembroke, MA 02359 with Parcel ID E15-17 depicted on a certain conceptual plan, prepared by McKenzie Engineering Group and attached hereto, and more particularly described as Lot 4A on a plan entitled "Plan of Land, Water Street, Pembroke, Massachusetts," dated April 9, 1986, drawn by Loring H. Jacobs, Co., recorded with Plymouth County Registry of Deeds as Plan Number 554 of 1986 in Plan Book 27, Page 207, including all easements, restrictions, and rights of way being a part thereof. For title reference see deed recorded with the Plymouth County Registry of Deeds in Book 6795, Page 272.

3. BUILDINGS, STRUCTURES, IMPROVEMENTS, FIXTURES

VACANT LAND.

4. TITLE DEED

Said premises are to be conveyed by a good and sufficient quitclaim deed running to the BUYER, or to the nominee designated by the BUYER by written notice to the SELLER at least seven (7) days before the deed is to be delivered as herein provided, and said deed shall convey a good and clear record and marketable title thereto, free from encumbrances, except
(a) Provisions of existing building and zoning laws;
(b) Existing rights and obligations in party walls which are not the subject of written agreement;
(c) Such taxes for the then current fiscal year as are not due and payable on the date of the delivery of such deed;
(d) Betterment assessments after the date of this agreement;
(e) Federal, state and local laws, ordinances, bylaws, rules and regulations relating to the use of land; and
(f) Easements, restrictions and reservations of record, if any.

5. PLANS

If said deed refers to a plan necessary to be recorded therewith the SELLER shall deliver such plan with the deed in form adequate for recording or registration.

6. REGISTERED TITLE

In addition to the foregoing, if the title to said premises is registered, said deed shall be in form sufficient to entitle the BUYER to a Certificate of Title of said premises, and the SELLER shall deliver with said deed all instruments, if any, necessary to enable the BUYER to obtain such Certificate of Title.

7. PURCHASE PRICE

The agreed purchase price for said premises is

One Million Nine Hundred and Fifty Thousand Dollars ($1,950,000.00) --------------------- , of which

$ 5,000.00 to be paid as a deposit herewith,
$ 1,945,000.00 are to be paid at the time of delivery and recording of the deed in cash, or by certified, cashier's, treasurer's or bank check(s) or attorney client fund check(s).
$ 1,550,000.00 TOTAL

$ 1,550,000.00
8. **TIME FOR PERFORMANCE; DELIVERY OF DEED**

Such deed is to be delivered at 10:00 a.m. on the at the time as further determined and provided herein at the Plymouth County Registry of Deeds or at the office of the conveyancing attorney provided that the same is within Plymouth County. It is agreed that time is of the essence of this agreement.

9. **POSSSESSION AND CONDITION OF PREMISE.**

Full possession of said premises, free of all tenants and occupants, is to be delivered at the time of the delivery of the deed, said premises to be then (a) in the same condition as they now are, reasonable use and wear thereof excepted, and (b) not in violation of said building and zoning laws, and (c) in compliance with provisions of any instrument referred to in clause 4 hereof. The **BUYER** shall be entitled personally to inspect said premises prior to the delivery of the deed in order to determine whether the condition thereof complies with the terms of this clause.

10. **EXTENSION TO PERFECT TITLE OR MAKE PREMISSES CONFORM**

If the **SELLER** shall be unable to give title or to make conveyance, or to deliver possession of the premises, all as herein stipulated, or if at the time of the delivery of the deed the premises do not conform with the provisions hereof, then the **SELLER** shall use reasonable efforts, provided that under no circumstances shall reasonable efforts be deemed to require **SELLER** to expend more than $1,000 in the aggregate to remove any defects in title, or to deliver possession as provided herein, or to make the said premises conform to the provisions hereof, as the case may be, in which event, the time for performance thereof shall be extended for a period of thirty (30) days.

11. **FAILURE TO PERFECT TITLE OR MAKE PREMISES CONFORM, etc.**

If at the expiration of the extended time the **SELLER** shall have failed so to remove any defects in title, deliver possession, or make the premises conform, as the case may be, all as herein agreed, or if at any time during the period of this agreement or any extension thereof, the holder of a mortgage on said premises shall refuse to permit the insurance proceeds, if any, to be used for such purposes, then any payments made under this agreement shall be forthwith refunded and any interest thereon and all other obligations of the parties hereto shall cease and this agreement shall be void without recourse to the parties hereto.

12. **BUYER’s ELECTION TO ACCEPT TITLE**

The **BUYER** shall have the election, at either the original or any extended time for performance, to accept such title as the **SELLER** can deliver to the said premises in their then condition and to pay therefore the purchase price without deduction, in which case the **SELLER** shall convey such title, except that in the event of such conveyance in accord with the provisions of this clause, if the said premises shall have been damaged by fire or casualty insured against, then the **SELLER** shall, unless the **SELLER** has previously restored the premises to their former condition, either

(a) pay over or assign to the **BUYER**, on delivery of the deed, all amounts recovered or recoverable on account of such insurance, less any amounts reasonably expended by the **SELLER** for any partial restoration, or

(b) If a holder of a mortgage on said premises shall not permit the insurance proceeds or a part thereof to be used to restore the said premises to their former condition or to be so paid over or assigned, give to the **BUYER** a credit against the purchase price, on delivery of the deed, equal to said amounts so recovered or recoverable and retained by the holder of the said mortgage less any amounts reasonably expended by the **SELLER** for any partial restoration.

13. **ACCEPTANCE OF DEED**

The acceptance of a deed by the **BUYER** or his nominee as the case may be, shall be deemed to be a full performance and discharge of every agreement and obligation herein contained or expressed, except such as are, by the terms hereof, to be performed after the delivery of said deed.

14. **USE OF MONEY TO CLEAR TITLE**

To enable the **SELLER** to make conveyance as herein provided, the **SELLER** may, at the time of delivery of the deed, use the purchase money or any portion thereof to clear the title of any or all encumbrances or interests, provided that all instruments so procured are recorded simultaneously with the delivery of said deed or thereafter in accordance with accepted practice.

15. **INSURANCE**

Until the delivery of the deed, the **SELLER** shall maintain insurance on said premises as follows:

- **Type of insurance**
- **Amount of Coverage**

  Fire and Extended Coverage  
  As presently insured

16. **ADJUSTMENTS**

Taxes for the then current fiscal year, shall be apportioned as of the day of performance of this agreement and the net amount thereof shall be added to or deducted from, as the case may be, the purchase price payable by the **BUYER** at the time of delivery of the deed.
17. ADJUSTMENT OF UNASSESSED AND ABATED TAXES

If the amount of said taxes is not known at the time of the delivery of the deed, they shall be apportioned on the basis of the taxes assessed for the preceding fiscal year, with a reapportionment as soon as the new tax rate and valuation can be ascertained; and, if the taxes which are to be apportioned shall thereafter be reduced by abatement, the amount of such abatement, less the reasonable cost of obtaining the same, shall be apportioned between the parties, provided that neither party shall be obligated to institute or prosecute proceedings for an abatement unless herein otherwise agreed.

18. BROKER'S FEE

A Broker's fee for professional services of N/A

19. BROKER'S WARRANTY

The Broker(s) named herein N/A warrant(s) that the Broker(s) is(are) duly licensed as such by the Commonwealth of Massachusetts.

20. DEPOSIT

All deposits made hereunder shall be held in escrow by Seller as escrow agent subject to the terms of this agreement and shall be duly accounted for at the time for performance of this agreement. In the event of any disagreement between the parties, the escrow agent may retain all deposits made under this agreement pending instructions mutually given by the Seller and the Buyer or a Court of competent jurisdiction. Any interest earned on deposit shall be split evenly between Buyer and Seller at closing.

21. BUYER'S DEFAULT; DAMAGES

If the Buyer shall fail to fulfill the Buyer's agreements herein, all deposits made hereunder by the Seller shall be retained by the Seller as liquidated damages and this shall be the Seller's sole and exclusive remedy both at law and/or in equity. Damages from a breach of Buyer's obligations hereunder are difficult to ascertain at the time of the signing of this Agreement and the parties agree that the amount is a reasonable estimate, at this time, of the Seller's expected damages.

22. RELEASE BY HUSBAND OR WIFE

The Seller's spouse hereby agrees to join in said deed and to release and convey all statutory and other rights and interests in said premises.

23. BROKER AS PARTY

The Broker(s) named herein join(s) in this agreement and become(s) a party hereto, insofar as any provisions of this agreement expressly apply to the Broker(s), and to any amendments or modifications of such provisions to which the Broker(s) agree(s) in writing.

24. LIABILITY OF TRUSTEE, SHAREHOLDER, BENEFICIARY, etc.

If the Seller or Buyer executes this agreement in a representative or fiduciary capacity, only the principal or the estate represented shall be bound, and neither the Seller or Buyer so executing, nor any shareholder or beneficiary of any trust, shall be personally liable for any obligation, express or implied, hereunder.

25. WARRANTIES AND REPRESENTATIONS

The Buyer acknowledges that the Buyer has not been influenced to enter into this transaction nor has he relied upon any warranties or representations not set forth or incorporated in this agreement or previously made in writing, except for the following additional warranties and representations, if any, made by either the Seller of the Broker(s): None. Buyer is purchasing the property in its "AS IS" condition, except as set forth herein.

26. CONSTRUCTION OF AGREEMENT

This instrument, executed in multiple counterparts, is to be construed as a Massachusetts contract, is to take effect as a sealed instrument, sets forth the entire contract between the parties, is binding upon and enures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be cancelled, modified or amended only by a written instrument executed by both the Seller and the Buyer. If two or more persons are named herein as Buyer, their obligations hereunder shall be joint and several. The captions and marginal notes are used only as a matter of convenience and are not to be considered a part of this agreement or to be used in determining the intent of the parties to it.

27. LEAD PAINT LAW

VACANT LAND

28. SMOKE DETECTORS AND CARBON MONOXIDE

VACANT LAND

29. ADDITIONAL PROVISIONS

The aforesaid riders, if any, attached hereto, are incorporated herein by reference. See Rider "A" attached hereto and incorporated herein.
NOTICE: This is a legal document that creates binding obligations. If not understood, consult an attorney.

Demos Realty Trust, SELLER
William J. Murphy, Jr., Trustee

River Marsh, LLC, BUYER
By, Brian F. Murphy, its Manager
RIDER A TO PURCHASE AND SALE AGREEMENT

SELLER: William J. Murphy, Jr., as Trustee of Demos Realty Trust u/d/l dated August 29, 1973 recorded in Plymouth County Registry of Deeds, Registered Land Division, Document #153347

BUYER: River Marsh L.L.C.

PREMISES: Lot located on the westerly side of Water Street, Pembroke, MA, identified as Parcel # E15-17 by Town of Pembroke property assessors.

DATE: December 6, 2016

Notwithstanding anything to the contrary set forth in the Purchase and Sale Agreement, the following provisions are hereby inserted. To the extent the provisions of this Rider A contradict with the terms of the Agreement, the provisions of this Rider A shall be deemed to be superseding.

30. Permit Condition. The obligations of the BUYER hereunder shall be conditioned upon the BUYER obtaining applicable permits, after applicable appeals, for the construction of a so-called 40B project including without limitation all Comprehensive Permits, building permits, Board of Health Permits, Conservation Orders of Conditions required for the construction of such multiunit affordable Housing Project. In the event BUYER is unable to obtain such permits and so notifies the SELLER, on or before January 1, 2022, by mail posted, this agreement shall terminate and all deposits and interest or dividends thereon hereunder shall be returned promptly. BUYER has the authority to file and apply for all necessary applications and permits under this paragraph and will provide copies of same to SELLER in advance for reasonable review and comment. Such notice date shall be automatically extended in the event of any pending appeal or 180 days beyond the granting of all such permits.

31. Notice. Any notice required or permitted under this Agreement shall be in writing delivered by hand or certified mail, return receipt requested (charges pre-paid), posted as of the date required, or by facsimile, to the following:

To the SELLER: William J. Murphy, Jr., Trustee
Demos Realty Trust
293 Washington Street
Norwell, MA 02061

To the BUYER: River Marsh LLC
293 Washington Street
Norwell, MA 02061
with a copy to: Warren F. Baker, Esq.
Baker, Braverman & Barbadoro, P.C.
300 Crown Colony Drive, Suite 500
Quincy, MA 02169
(781) 848-9610 (781) 848-9790 (fx)
E-Mail: warrenb@bbb-lawfirm.com

In order to facilitate the execution and delivery of certain documents contemplated hereby, the parties grant to their respective attorneys named above the actual authority to execute and deliver on each party's behalf any (a) agreement modifying the time for the performance of any event hereunder, or (b) any notice that may be given under this Agreement, and the parties may rely upon the signature of such attorneys (including faxed signatures) unless a party has disclaimed the authority granted herein by written notice given to the other party as provided above.

32. **Title Provisions.** Except as otherwise provided for within this Agreement, in matters respecting title to the premises, standards of the Massachusetts Real Estate Bar Association shall be determinative where applicable.

33. **Inspection and Representations.** BUYER represents that he has made a total examination of the Premises, the neighborhood, the surrounding areas, the municipality in which the Premises are located, and all legal issues (excepting title) pertaining to the purchase of the Premises, including without limitation, building code and zoning matters, and after negotiations is purchasing the property and paying the purchase price in accordance with the Agreement based on his assessment and examination of all of the above. BUYER warrants that he shall rely on such examinations, that he is satisfied with the results of such examinations, and that SELLER and BROKER have made no warranties or representations, express or implied, upon which BUYER has relied concerning the condition of the Premises, or other matters referred to above. BUYER further acknowledges that the current condition of the Premises has been considered in establishing the Purchase Price set forth in this Agreement. Without limiting the generality of the foregoing, the parties acknowledge and agree that the Premises shall be sold strictly on an "as is," "where is," and "with all defects" basis, without representation or warranty, express, implied or statutory, of any kind, including, without limitation, representation or warranty as to condition (structural, mechanical or otherwise), construction, compliance with law, habitability, merchantability or fitness for any purpose, all of which are hereby disclaimed and which BUYER hereby waives. The provisions of this paragraph shall survive the delivery of the deed.

34. **Entry to Premises.** BUYER shall have the right to enter the premises at reasonable times prior to the Closing Date ("Due Diligence Period") for the purposes of showing the property to prospective lenders, for the taking of measurements, or for making reasonable inspections of purpose. BUYER shall indemnify and hold SELLER harmless from all damages, costs, loss, and liability associated with said access. BUYER shall have the right to inspect and examine the Property to the extent BUYER deems necessary in its sole discretion, to determine the condition of the Property and the suitability of the Premises for its development. BUYER's
representatives, consultants, agents and employees shall, during regular business hours, (a) have the right to cause complete environmental reviews and site assessments and inspections of the Property to be made, (b) have access to all buildings, improvements, and (c) conduct all other necessary feasibility studies, title reports, surveys, soils tests, ground water tests, engineering studies, examination of zoning status, building and use permits, sign permits and all other permits required for the Property. While conducting such investigations, tests and studies, BUYER shall not unreasonably disturb or interfere the Property. Prior to the expiration of the Due Diligence Period, BUYER shall notify Seller if BUYER is not satisfied with such investigations and reviews and BUYER shall have the right, in its sole and absolute discretion, to terminate this Agreement and receive a refund of its Deposit, in which event, except as specifically provided otherwise in this Agreement, the parties shall have no further obligations to each other under this Agreement.

35. **Entire Agreement.** This document shall constitute the entire agreement of the parties regarding the subject matter hereof. It may not be altered or amended except by a writing signed by the parties. This instrument, executed in triplicate, is to take effect as a sealed instrument, is binding upon and inures to the benefit of the parties hereto and their respective heirs, devisees, executors, administrators, successors and assigns, and may be canceled, modified or amended only by a written instrument executed by both the SELLER and the BUYER. If two or more persons are named herein as BUYER their obligations hereunder shall be joint and several.

36. **Closing.** The Closing shall occur upon notice to the Sellers by the Buyer on or within 180 from the receipt of all applicable and necessary permits for the construction of the affordable housing development of Buyer's design and the expiration of all appeal periods without appeal, including without limitation building permits issued by the Town of Pembroke.

**SELLER:**

[Signature]

Demos Realty Trust
William J. Murphy, Jr., Trustee

**BUYER:**

[Signature]

River Marsh, LLC
Brian Murphy, its Manager
Hi Mike

Here is the revised application and plan for River Marsh in Pembroke.

We are down to 56 units and have moved off the knoll out toward the river as we discussed. Please let me know if you have any comments/questions. I will mail out hard copies to your office and to the Pembroke ZBA.

Thanks,

Brian
Comprehensive Permit Site Approval Application/Homeownership

www.masshousing.com | www.masshousingrental.com
Comprehensive Permit Site Approval Application/Homeownership

Attached is the Massachusetts Housing Finance Agency ("MassHousing") application form for Project Eligibility/Site Approval ("Site Approval") under the state's comprehensive permit statute (M.G.L. c. 40B, Sections 20-23 enacted as Chapter 774 of the Acts of 1969) known as "Chapter 40B". Developers seeking a comprehensive permit to construct affordable housing under Chapter 40B and intending to use a MassHousing financing program or financing through the New England Fund ("NEF") program must receive Site Approval from MassHousing. This approval (also referred to as "project eligibility approval") is a required component of any comprehensive permit application to be submitted to the local Zoning Board of Appeals of the municipality in which the development is to be located.

As part of its review of your application, MassHousing will conduct an inspection of the site and will solicit comments from the relevant municipality. MassHousing will consider any relevant concerns that the municipality might have about the proposed project or the developer. The applicant is encouraged, therefore, to make contact with the municipality prior to submitting the Site Approval application in order to ensure that the applicant understands any concerns that the municipality may be likely to raise regarding the proposed development.

In order for a project to receive Site Approval, MassHousing must determine that (i) the applicant has sufficient legal control of the site; (ii) the applicant is a public agency, non-profit organization or limited dividend organization; and (iii) the applicant and the project are generally eligible under the requirements of the MassHousing program selected by the applicant, subject to final eligibility review and approval. Furthermore, MassHousing must determine that the site of the proposed project is generally appropriate for residential development (taking into consideration municipal actions previously taken to meet affordable housing needs) and that the conceptual project design is generally appropriate for the site. In order for MassHousing to be able to make these findings (required by 760 CMR 56.04 (4)), it is important that you answer all questions in the application and include all required attachments.

Please note that MassHousing requires that all applicants meet with a member of our 40B Department staff before submitting their application. Applications for any projects that have not been the subject of a required pre-application meeting will not be accepted or processed.

Upon completion of its analysis, MassHousing will either issue a Site Approval Letter that approves, conditionally approves or denies the application. If the application is approved, the applicant should apply to the Zoning Board of Appeals within two years from the date of the Site Approval Letter (unless MassHousing extends such term in writing).

Please note that Site Approval from MassHousing does not constitute a loan commitment by MassHousing or any other financing program. All potential MassHousing financing is subject to further review and underwriting by MassHousing's Rental Lending Department.

Please be sure you have familiarized yourself with all of the applicable requirements set forth in the Chapter 40B regulations and guidelines, which can be found at

www.mass.gov/rel/economic/cohesed/hcde/legal/regs/760-cmr-56.html and
www.mass.gov/rel/docs/hcde/legal/comprehensivepermitguidelines.pdf
Instructions for completing the Site Approval Application are included in the application form, which is attached. The completed application form and all additional documentation should be sent, after your pre-application meeting has been held, to

Gregory Watson, Manager of Comprehensive Permit Programs
MassHousing, One Beacon Street, Boston, MA 02108

We look forward to working with you on your proposed development. Please contact Gregory Watson at 617-854-1880 or gwatson@masshousing.com to discuss scheduling your pre-application meeting or if there is any assistance that we can provide in the meantime to make your application process a smooth and efficient one.

Our Commitment to You

MassHousing recognizes that applicants seek some measure of predictability regarding the timeframe for our processing of their applications. Our staff will endeavor to adhere to the following schedule for reviewing applications for site approval:

Within two (2) business days of receipt of your application (provided that you have attended a required pre-application meeting) a member of our staff will notify you of any of the items listed on the checklist at the end of the application form that were missing from your application package. Please note that our acknowledgement of receipt of an item does not indicate that any substantive review has yet taken place.

If your application package is missing any of the items indicated on the checklist by an asterisk, we will not be able to continue processing your application until such items are received.

If we have received the information that is crucial to the commencement of our review process, we will proceed to (i) give the municipality a period of thirty (30) days in which to submit comments relating to your proposal; (ii) schedule and conduct a site visit; and (iii) solicit bids for and commission and review an “as is” appraisal of your site.

If during our review of your application package we determine that additional information or clarification is needed, we will notify you as soon as possible. Depending on when we receive such additional information, this may affect the amount of time required for MassHousing to complete the site approval process.

Assuming that your application package was complete and that you respond in a timely manner to requests for additional information or clarification, we would expect to issue or deny your site approval within 60 days of our receipt of your application package.
Application for Chapter 40B Project Eligibility/Site Approval for MassHousing-Financed and New England Fund ("NEF") Homeownership Projects

Please be sure to answer ALL questions. Indicate "N/A", "None" or "Same" when necessary.

Section 1: GENERAL INFORMATION (also see Required Attachments listed at end of Section 1)

Name of Proposed Project: River Marsh Village

Municipality: Pembroke
Address of Site: 274 Water St
Cross Street (if applicable): Church St (Route 139) is the closest cross St
Zip Code: 02359
Tax Parcel I.D. Number(s) (Map/Block/Lot): E15-17-A & E15-17

Name of Proposed Development Entity (typically a single purpose entity): River Marsh, LLC

Entity Type: Limited Dividend Organization ☑  Non-Profit ☐  Government Agency ☐

* If the Proposed Development Entity is a Non-Profit, please contact MassHousing regarding additional documentation that must be submitted.

Has this entity already been formed? Yes ☑  No ☐

Name of Applicant (typically the Proposed Development Entity or its controlling entity or individual): River Marsh, LLC

Applicant's Web Address, if any:  

Does the Applicant have an identity of interest with any other member of the development team or other party to the Proposed Project? Yes ☐  No ☑  If yes, please explain:  

Primary Contact Information (required)
Name of Individual: Brian Murphy
Relationship to Applicant: Owner
Name of Company (if any):  
Street Address: 293 Washington St
City/State/Zip: Norwell, MA 02061
Telephone (office and cell) and Email: (O) 781-659-2255 (C) 781-760-0682 brianmurphy@unicornrealty.com

Secondary Contact Information (required)
Name of Individual: Warren Baker
Relationship to Applicant: Attorney
Name of Company (if any): Baker Braverman & Barbadoro
Street Address: 300 Crown Colony Drive Ste 500
City/State/Zip: Quincy, MA 02169
Telephone (office and cell) and Email: (O) 781-848-9610 (C) 781-910-9610 warrenb@bbb-lawfirm.com
Additional Contact Information (optional)
Name of Individual: __________________________________________________________________________
Relationship to Applicant: ______________________________________________________________________
Name of Company (if any): _______________________________________________________________________
Street Address: _________________________________________________________________________________
City/State/Zip: ________________________________________________________________________________
Telephone (office and cell) and Email: ___________________________________________________________________

Anticipated Permanent Financing: MassHousing □ NEF Bank □
If NEF Bank, Name of Bank: South Shore Bank

Total Number of Units 56  # Affordable Units 14  # Market Rate Units 42
Age Restricted? Yes/No No  If Yes, 55+ or 62+? ______

Brief Project Description (150 words or less):
The project proposes 56 townhouse condominiums on approximately 49 acres in Pembroke, MA off of Water St.

Required Attachments Relating to Section 1

1.1 Location Map
Provide a USGS or other form of map clearly marked to show the site's location, and an approximate property boundary.

1.2 Tax Map
Provide a copy of municipal tax map (assessor's plan) with subject parcels and parcel ID #'s clearly identified.

1.3 Directions
Provide detailed written directions to the site, noting the entrance to the site, relevant boundaries and any prominent landmarks that can be used for identification purposes.
Application for Chapter 40B Project Eligibility/Site Approval
for MassHousing-Financed and New England Fund ("NEF") Homeownership Projects

Section 2: EXISTING CONDITIONS / SITE INFORMATION (also see Required Attachments listed at end of Section 2)

In order to issue Site Approval, MassHousing must find (as required by 760 CMR 56.04 (4I)) that the site is generally appropriate for residential development.

Name of Proposed Project: **River Marsh Village**

<table>
<thead>
<tr>
<th>Buildable Area Calculations</th>
<th>Sq. Feet/Acres (enter &quot;0&quot; if applicable–do not leave blank!)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Site Area</td>
<td>2,175,386 sf / 49.94 ac</td>
</tr>
<tr>
<td>Wetland Area</td>
<td>1,368,085 sf / 31.40 ac</td>
</tr>
<tr>
<td>Flood/Hazard Area</td>
<td>1,532,018 sf / 35.17 ac</td>
</tr>
<tr>
<td>Endangered Species Habitat (animal and/or plant)</td>
<td>1,720,073 sf / 39.49 ac</td>
</tr>
<tr>
<td>Conservation/Article 97 Land</td>
<td></td>
</tr>
<tr>
<td>Protected Agricultural Land</td>
<td></td>
</tr>
<tr>
<td>Other Non-Buildable (Describe)</td>
<td></td>
</tr>
<tr>
<td><strong>Total Non-Buildable Area</strong></td>
<td>1,368,085 sf / 31.40 ac wetlands</td>
</tr>
<tr>
<td><strong>Total Buildable Site Area</strong></td>
<td>807,301 sf / 18.54 ac</td>
</tr>
</tbody>
</table>

Current use of the site and prior use if known: **Wooded undeveloped land and single family home.**

Is the site located entirely within one municipality? **Yes** ☑ **No** ☐

If not, in what other municipality is the site located? __________

How much land is in each municipality? *(the Existing Conditions Plan must show the municipal boundary lines)*

Current zoning classification and principal permitted uses: **Residence A - detached single family homes**
**Business B - offices, retail, businesses**

Previous Development Efforts
Please list *(on the following page)* any previous applications pertaining to construction on or development of the site, including (i) type of application (comprehensive permit, subdivision, special permit, etc.); (ii) application filing date; (iii) date of denial, approval or withdrawal. Also indicate the current Applicant's role, if any, in the previous applications. **Note that, pursuant to 760 CMR 56.03 (1), a decision of a Zoning Board of Appeals to deny a Comprehensive Permit, or (if the Statutory Minima defined at 760 CMR 56.03 (3) (b) or (c) have been satisfied) grant a Comprehensive Permit with conditions, shall be upheld if a related application has previously been received, as set forth in 760 CMR 56.03 (7).**
To the best of your knowledge, has this site ever been rejected for project eligibility/site approval by another subsidizing agency or authority? No

<table>
<thead>
<tr>
<th>Existing Utilities and Infrastructure</th>
<th>Yes/No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastewater-private wastewater treatment</td>
<td>Yes</td>
<td>Proposed common septic system</td>
</tr>
<tr>
<td>Wastewater-public sewer</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Storm Sewer</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Water-public water</td>
<td>Yes</td>
<td>8&quot; CI watermain- Town of Pembroke</td>
</tr>
<tr>
<td>Water-private well</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Natural Gas</td>
<td>Yes</td>
<td>Columbia Gas of Massachusetts</td>
</tr>
<tr>
<td>Electricity</td>
<td>Yes</td>
<td>National Grid / Eversource</td>
</tr>
<tr>
<td>Roadway Access to Site</td>
<td>Yes</td>
<td>Church Street to Water Street</td>
</tr>
<tr>
<td>Sidewalk Access to Site</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Describe surrounding land use(s): Residential parcels with colonial style wood framed structures. Magoun Cemetery (Town of Pembroke)

<table>
<thead>
<tr>
<th>Surrounding Land Use/Amenities</th>
<th>Distance from Site</th>
<th>Available by Public Transportation?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shopping Facilities</td>
<td>.5 miles</td>
<td>10 minute walk</td>
</tr>
<tr>
<td>Schools</td>
<td>.5-4 Miles</td>
<td>Yes. Town School Bus</td>
</tr>
<tr>
<td>Government Offices</td>
<td>3 Mi</td>
<td></td>
</tr>
<tr>
<td>Multi-Family Housing</td>
<td>1 mile</td>
<td></td>
</tr>
<tr>
<td>Public Safety Facilities</td>
<td>3 miles</td>
<td></td>
</tr>
<tr>
<td>Office/Industrial Uses</td>
<td>.5 miles</td>
<td></td>
</tr>
<tr>
<td>Conservation Land</td>
<td>.25 mi</td>
<td></td>
</tr>
<tr>
<td>Recreational Facilities</td>
<td>.5 mi</td>
<td></td>
</tr>
<tr>
<td>Houses of Worship</td>
<td>.5-3 miles</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
List any public transportation near the site, including type of transportation and distance from the site:
The GATRA bus line has a stop that picks up at the Stop & Shop/Kohls Plaza less than a half mile from the site.
The P&B bus line has a stop at Roche Brothers in Marshfield which is 2.5 miles down Route 139.
The closest commuter rail stop is Hanson which is 8.4 miles away.

Site Characteristics and Development Constraints

Please answer “Yes”, “No” or “Unknown” to the following questions. If the answer is “Yes” please identify on Existing Conditions Plan as required for Attachment 2.1 and provide additional information and documentation as an attachment as instructed for Attachment 2.4, “Documentation Regarding Site Characteristics/Constraints.”

Are there any easements, rights of way or other restrictions of record affecting the development of the site? No

Are there documented hazardous waste sites on or within a ½ mile radius of the site? No

Is there any evidence of underground storage tanks or releases of hazardous material, including hazardous waste, on the site or within close proximity to the site? No

Are there any above-ground storage containers with flammable or explosive petroleum products or chemicals on or within ½ mile of the site? Unknown - single family oil heating

Is the site, or any portion thereof, located within a designated flood hazard area? Yes

Does the site include areas designated by Natural Heritage as endangered species habitat? Yes

Are there documented state-designated wetlands on the site? Yes

Are there documented vernal pools on the site? Unknown

Is the site within a local, state or federal Historic District? No

Is the site or any building(s) on the site listed, nominated or eligible for listing on the National Register of Historic Places? No

Has the site or any building(s) on the site been designated as a local, state or national landmark? No

Are there existing buildings and structures on site? Yes 1 single family home

Does the site include documented archeological resources? Unknown

Does the site include significant areas of ledge? No

Does the site include areas with slopes greater than 10%? No

If applying for MassHousing Financing, is any portion of the site considered “Prime” or “Unique” agricultural land under Executive Order 193? No
Required Attachments Relating to Section 2

2.1 Existing Conditions Plan

Please provide a detailed Existing Conditions Plan showing the entire site prepared, signed and stamped by a registered engineer or land surveyor. Plans should be prepared at a scale of 1”=100’ or 1”=200’ and should include the following information:

a. Reduced scale locus map
b. Surveyed property boundaries
c. Topography (2’ contours)
d. Wetland boundaries (if applicable)
e. Existing utilities (subsurface and above ground)
f. Natural features including bodies of water, rock outcroppings
g. Existing easements and/or rights of way on the property
h. Existing buildings and structures, including walls, fences, wells
i. Existing vegetated areas; specimen trees or those with caliper greater than 18” should be shown individually
j. Existing site entries and egresses

Please provide two (2) sets of full size (30” x 40” plans) along with three (3) sets of 11” x 17” reproductions.

2.2 Aerial Photographs

Please provide one or more aerial photograph(s) of the site (such as those available online) showing the immediate surrounding area if available. Site boundaries and existing site entrance and access points must be clearly marked.

2.3 Site/Context Photographs

Please provide photographs of the site and surrounding physical and neighborhood context, including nearby buildings, significant natural features and land uses. Please identify the subject and location of all photographs.

2.4 Documentation Regarding Site Characteristics/Constraints

Please provide documentation of site characteristics and constraints as directed including narratives, summaries and relevant documentation including:

Flood Insurance Rate Map (FIRM) showing site boundaries
Wetlands delineation
Historic District nomination(s)

2.5 By-Right Site Plan (if available)

Mass Housing will commission, at your expense, an "as-is" appraisal of the site in accordance with the Guidelines, Section B (1). Therefore, if there is a conceptual development plan which would be permitted under current zoning and which you would like the appraiser to take into consideration, or if permits have been issued for alternative development proposals for the site, please provide two (2) copies of a "by-right" site plan showing the highest and best use of the site under current zoning, and copies of any existing permits. These will assist the appraiser in determining the "as is" value of the site without any consideration being given to its potential for development under Chapter 40B.
Application for Chapter 40B Project Eligibility/Site Approval
for MassHousing-Financed and New England Fund ("NEF") Homeownership Projects

**Section 3: PROJECT INFORMATION** (also see Required Attachments listed at end of Section 3)

In order to issue Site Approval, MassHousing must find (as required by 760 CMR 56.04 (4)) that the proposed project appears generally eligible under the requirements of the housing subsidy program and that the conceptual project design is generally appropriate for the site.

Name of Proposed Project: **River Marsh Village**

Project Type (mark both if applicable): New Construction [✓] Rehabilitation [ ] Both [ ]

Total Number of Dwelling Units: **56**
Total Number of Affordable Units: **14**

**Unit Mix: Affordable Units**

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>0 Bedroom</th>
<th>1 Bedroom</th>
<th>2 Bedroom</th>
<th>3 Bedroom</th>
<th>4 Bedroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Units</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Number of Bathrooms</td>
<td>2.5</td>
<td>2.5</td>
<td>1900</td>
<td>2100</td>
<td></td>
</tr>
</tbody>
</table>

**Unit Mix: Market Rate**

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>0 Bedroom</th>
<th>1 Bedroom</th>
<th>2 Bedroom</th>
<th>3 Bedroom</th>
<th>4 Bedroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Units</td>
<td>0</td>
<td>0</td>
<td>15</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>Number of Bathrooms</td>
<td>2.5</td>
<td>2.5</td>
<td>1900</td>
<td>2100</td>
<td></td>
</tr>
</tbody>
</table>

Percentage of Units with 3 or More Bedrooms*: **66%**

* Note that the January 17, 2014 Interagency Agreement Regarding Housing Opportunities for Families with Children requires that at least 10% of the units in the project must have three (3) or more bedrooms. Evidence of compliance with this requirement must be provided at Final Approval.

Number of Handicapped Accessible Units: **0**
Market Rate: **0**
Affordable: **0**

Gross Density [units per acre]: **2.2**
Net Density [units per buildable acre]: **3.14**
### Residential Building Information

<table>
<thead>
<tr>
<th>Building Type and Style</th>
<th>Construction or Rehabilitation</th>
<th>Number of Stories</th>
<th>Height</th>
<th>GFA</th>
<th>Number Bldgs. of this type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Townhouse</td>
<td>Construction</td>
<td>1.5</td>
<td>30</td>
<td>2500</td>
<td>56</td>
</tr>
</tbody>
</table>

### Non-Residential Building Information

<table>
<thead>
<tr>
<th>Building Type and Style</th>
<th>Construction or Rehabilitation</th>
<th>Number of Stories</th>
<th>Height</th>
<th>GFA</th>
<th>Number Bldgs. of this type</th>
</tr>
</thead>
</table>

Will all features and amenities available to market unit residents also be available to affordable unit residents? If not, explain the differences. Exteriors will all look the same for market and affordable. Affordable interiors will have formica instead of granite counters, carpet and tile instead of hardwood floors, and white appliances rather than stainless steel.

---

**Parking**

Total Parking Spaces Provided: **254**

Ratio of Parking Spaces to Housing Units: **4.5**

Lot Coverage *(Estimate the percentage of the site used for the following)*

- Buildings: **5.4%**
- Parking and Paved Areas: **5%**
- Usable Open Space: **35.6%**
- Unusable Open Space: **54.4%**
- Lot Coverage: **11.5%**

Does project fit definition of “Large Project” (as defined in 760 CMR 56.03 (6))? Yes/No **No**
Required Attachments Relating to Section 3

3.1 Preliminary Site Layout Plan(s)
Please provide preliminary site layout plans of the entire site prepared, signed and stamped by a registered architect or engineer. Plans should be prepared at a scale of 1"=100' or 1"=200', and should show:

- Proposed site grading (2' contours)
- Existing lot lines
- Fasements (existing and proposed)
- Access to a public way must be identified
- Required setbacks
- Proposed site circulation (entrances/egresses, roadways, driveways, parking areas, walk ways, paths, trails)
- Building and structure footprints (label)
- Utilities (existing and proposed)
- Open space areas
- Schematic landscaping and screening
- Wetland and other restricted area boundaries and buffer zones

Please provide two (2) sets of full size (30" x 40") plans along with three (3) sets of 11" x 17" reproductions.

3.2 Graphic Representations of Project/Preliminary Architectural Plans

- Typical floor plans
- Unit plans showing dimensions, bedrooms, bathrooms and overall unit layout
- Exterior elevations, sections, perspectives and illustrative rendering.

3.3 Narrative Description of Design Approach
Provide a narrative description of the approach to building massing, style and exterior materials; site layout; and the relationship of the project to adjacent properties, rights of way and existing development patterns. The handbook called Approach to Chapter 40B Design Reviews prepared by the Cecil Group in January 2011 may be helpful in demonstrating the nature of the discussion that MassHousing seeks in this narrative.

3.4 Tabular Zoning Analysis
Zoning analysis in tabular form comparing existing zoning requirements to the waivers that you will request from the Zoning Board of Appeals for the proposed project, showing required and proposed dimensional requirements including lot area; frontage; front, side and rear setbacks; maximum building coverage; maximum lot coverage; height; number of stories; maximum gross floor area ratio; units per acre; units per buildable acre; number of parking spaces per unit/square foot; and total number of parking spaces (proposed and required).

3.5 Completed Sustainable Development Principles Evaluation Assessment Form (see attached form)
All developments seeking Chapter 40B site approval must demonstrate consistency with the Commonwealth's May 2007 Sustainable Development Principles.
Section 4: SITE CONTROL (also see Required Attachments listed at end of Section 4)

In order to issue Site Approval, MassHousing must find (as required by 760 CRM 56.04 (4)) that the Applicant controls the site.

Name of Proposed Project: River Marsh Village

Describe current ownership status of the entire site as shown on the site layout plans (attach additional sheets as necessary if the site is comprised of multiple parcels governed by multiple deeds or agreements):

- Owned (or ground leased) by Development Entity or Applicant  □
- Under Purchase and Sale Agreement  ☑
- Under Option Agreement  □

Note: The Grantee/Buyer on each document must be either the Applicant or the Proposed Development Entity, or you must attach an explanation showing direct control of the Grantee/Buyer by the Applicant or the Proposed Development Entity.

Grantor/Seller: Red Castle, LLC and Demos Realty Trust

Grantee/Buyer: River Marsh, LLC

Grantee/Buyer is (check one):
- Applicant  ☑
- Development Entity  □
- Managing General Partner of Development Entity  □
- General Partner of Development Entity  □
- Other (explain) ________________________________

Are the Parties Related? Yes

For Deeds or Ground Leases

Date(s) of Deed(s) or Ground Lease(s):

Purchase Price: ____________________________

For Purchase and Sale Agreements or Option Agreements

Date of Agreement: 9/1/2016

Expiration Date: 8/30/2021

If an extension has been granted, date of extension:

If an extension has been granted, new expiration date:

Purchase Price: 2,500,000.00

Will any easements or rights of way over other properties be required in order to develop the site as proposed? Yes  ☑  No □

If Yes, please describe current status of easement:

Owned (or ground leased) by Development Entity or Applicant: Existing easements are part of both Demos and Red Castle properties

Under Purchase and Sale Agreement

Under Option Agreement
Note: The Grantee/Buyer on each document must be either the Applicant or the Proposed Development Entity, or you must attach an explanation showing direct control of the Grantee/Buyer by the Applicant or the Proposed Development Entity.

Grantor/Seller: Red Castle, LLC and Demos Realty Trust
Grantee/Buyer: River Marsh, LLC
Are the Parties Related? Yes

For Easements
Date(s) of Easement(s): ________________________________
Purchase Price: ________________________________

For Easement Purchase and Sale Agreements or Easement Option Agreements
Date of Agreement: ________________________________
Expiration Date: ________________________________
If an extension has been granted, date of extension: ________________________________
If an extension has been granted, new expiration date: ________________________________
Purchase Price: ________________________________

Required Attachments Relating to Section 4
4.1 Evidence of Site Control (required)
Copies of all applicable, fully executed documents (deed, ground lease, purchase and sale agreement, option agreement, land disposition agreement) showing evidence of site control, including any required easements, along with copies of all amendments and extensions. Copies of all plans referenced in documents must be included.
Application for Chapter 40B Project Eligibility/Site Approval for MassHousing-Financed and New England Fund ("NEF") Homeownership Projects

Section 5: FINANCIAL INFORMATION - Site Approval Application Homeownership 408

In order to issue Site Approval, MassHousing must find (as required by 760 CMR 56.04 (4)) that an initial pro forma has been reviewed and that the Proposed Project appears financially feasible and consistent with the Chapter 40B Guidelines, and that the Proposed Project is fundable under the applicable program.

Name of Proposed Project: River Marsh Village

Initial Capital Budget (please enter "0" when no such sales/revenue or cost is anticipated)

<table>
<thead>
<tr>
<th>Sales/Revenue</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Market</td>
<td>24,050,000</td>
</tr>
<tr>
<td>Affordable</td>
<td>2,450,000</td>
</tr>
<tr>
<td>Identity of Interest (Market)</td>
<td></td>
</tr>
<tr>
<td>Other Income</td>
<td></td>
</tr>
<tr>
<td>Total Sales/Revenue</td>
<td>26,500,000</td>
</tr>
</tbody>
</table>

Pre-Permit Land Value, Reasonable Carrying Costs

<table>
<thead>
<tr>
<th>Item</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Acquisition: pre-permit land value (to be determined by MassHousing commissioned appraisal) plus reasonable carrying costs.</td>
<td>1,130,000</td>
</tr>
</tbody>
</table>

Costs

<table>
<thead>
<tr>
<th>Item</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acquisition Cost</strong></td>
<td></td>
</tr>
<tr>
<td>Site Acquisition: pre-permit land value (to be determined by MassHousing Commissioned Appraisal) plus reasonable carrying costs</td>
<td>1,130,000</td>
</tr>
<tr>
<td>Subtotal - Acquisition Costs</td>
<td>1,130,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Construction Costs - Residential Construction (Hard Costs)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Structure Costs</td>
<td>11,791,500</td>
</tr>
<tr>
<td>Hard Cost Contingency</td>
<td>589,575</td>
</tr>
<tr>
<td>Subtotal - Residential Construction (Hard Costs)</td>
<td>12,381,075</td>
</tr>
</tbody>
</table>
## Costs

<table>
<thead>
<tr>
<th>Item</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Costs – Site Work (Hard Costs)</strong></td>
<td></td>
</tr>
<tr>
<td>Earth Work</td>
<td>1,179,150</td>
</tr>
<tr>
<td>Utilities: On Site</td>
<td>331,650</td>
</tr>
<tr>
<td>Utilities: Off Site</td>
<td></td>
</tr>
<tr>
<td>Roads and Walks</td>
<td>1,029,350</td>
</tr>
<tr>
<td>Site Improvement</td>
<td>60,000</td>
</tr>
<tr>
<td>Lawns and Planting</td>
<td>117,915</td>
</tr>
<tr>
<td>Geotechnical Condition</td>
<td></td>
</tr>
<tr>
<td>Environmental Remediation</td>
<td>100,000</td>
</tr>
<tr>
<td>Demolition</td>
<td></td>
</tr>
<tr>
<td>Unusual Site Conditions/Other Site Work</td>
<td>1,200,000</td>
</tr>
<tr>
<td><strong>Subtotal – Site Work (Hard Costs)</strong></td>
<td>4,018,065</td>
</tr>
<tr>
<td><strong>Construction Costs – General Conditions, Builders Overhead and Profit (Hard Costs)</strong></td>
<td></td>
</tr>
<tr>
<td>General Conditions</td>
<td>707,490</td>
</tr>
<tr>
<td>Builder's Overhead</td>
<td>235,830</td>
</tr>
<tr>
<td>Builder’s Profit</td>
<td>707,490</td>
</tr>
<tr>
<td><strong>Subtotal – General Conditions Builder’s Overhead and Profit (Hard Costs)</strong></td>
<td>1,650,810</td>
</tr>
<tr>
<td><strong>General Development Costs (Soft Costs)</strong></td>
<td></td>
</tr>
<tr>
<td>Appraisal and Marketing Study</td>
<td>4,500</td>
</tr>
<tr>
<td><em>not 40B “as is” appraisal</em></td>
<td></td>
</tr>
<tr>
<td>Lottery</td>
<td></td>
</tr>
<tr>
<td>Commissions/Advertising-Affordable</td>
<td>122,500</td>
</tr>
<tr>
<td>Commissions/Advertising-Market</td>
<td>1,027,500</td>
</tr>
<tr>
<td>Model Unit</td>
<td>75,000</td>
</tr>
<tr>
<td>Closing Costs <em>(unit sales)</em></td>
<td>27,000</td>
</tr>
<tr>
<td>Real Estate Taxes <em>(during construction)</em></td>
<td>125,000</td>
</tr>
<tr>
<td>Utility Usage <em>(during construction)</em></td>
<td>10,000</td>
</tr>
<tr>
<td>Insurance <em>(during construction)</em></td>
<td>168,000</td>
</tr>
<tr>
<td>Security <em>(during construction)</em></td>
<td></td>
</tr>
<tr>
<td>Inspecting Engineer</td>
<td>35,000</td>
</tr>
<tr>
<td>Fees to Others</td>
<td></td>
</tr>
<tr>
<td>Construction Loan Interest</td>
<td>901,665</td>
</tr>
<tr>
<td>Fees to Construction Lender</td>
<td></td>
</tr>
<tr>
<td>Architectural</td>
<td>150,000</td>
</tr>
<tr>
<td>Engineering</td>
<td>136,500</td>
</tr>
<tr>
<td>Survey, Permits, etc.</td>
<td>198,000</td>
</tr>
<tr>
<td>Clerk of the Works</td>
<td>200,000</td>
</tr>
<tr>
<td>Construction Manager</td>
<td>300,000</td>
</tr>
<tr>
<td>Item</td>
<td>Budgeted</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>General Development Costs (Soft Costs) — Continued</td>
<td></td>
</tr>
<tr>
<td>Bond Premiums (Payment/Performance/Lien Bond)</td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>100,000</td>
</tr>
<tr>
<td>Title (including title insurance) and Recording</td>
<td>104,880</td>
</tr>
<tr>
<td>Accounting and Cost Certification (incl. 40B)</td>
<td>45,000</td>
</tr>
<tr>
<td>Relocation</td>
<td></td>
</tr>
<tr>
<td>40B Site Approval Processing Fee</td>
<td>2,500</td>
</tr>
<tr>
<td>40B Technical Assistance/Mediation Fund Fee</td>
<td>3,580</td>
</tr>
<tr>
<td>40B Land Appraisal Cost (as-is value)</td>
<td>4,500</td>
</tr>
<tr>
<td>40B Final Approval Processing Fee</td>
<td>5,000</td>
</tr>
<tr>
<td>40B Subsidizing Agency Cos. Certification Examination Fee</td>
<td>2,500</td>
</tr>
<tr>
<td>40B Monitoring Agent Fees</td>
<td>8,500</td>
</tr>
<tr>
<td>40B Security Fees</td>
<td>50,000</td>
</tr>
<tr>
<td>Other Financing Fees</td>
<td></td>
</tr>
<tr>
<td>Development Consultant</td>
<td></td>
</tr>
<tr>
<td>Other Consultants (describe)</td>
<td></td>
</tr>
<tr>
<td>Other Consultants (describe)</td>
<td></td>
</tr>
<tr>
<td>Soft Cost Contingency</td>
<td>201,600</td>
</tr>
<tr>
<td>Other General Development (Soft) Costs</td>
<td></td>
</tr>
<tr>
<td>Subtotal — General Development Costs (Soft Costs)</td>
<td>4,008,725</td>
</tr>
</tbody>
</table>

| Developer Overhead                                                   |            |
| Developer Overhead                                                   | 112,000    |
| Subtotal — Developer Overhead                                        | 112,000    |

| Summary of Subtotals                                                |            |
| Sales/Revenue                                                        | 26,500,000 |
| Site Acquisition                                                     | 1,130,000  |
| Residential Construction                                             | 12,381,075 |
| Site Work                                                            | 4,018,065  |
| Builder's Overhead, Profit and General Conditions                   | 1,660,810  |
| General Development Costs                                           | 4,008,725  |
| Developer Overhead                                                   | 112,000    |

| Summary                                                              |            |
| Total Sales/Revenue                                                  | 26,500,000 |
| Total Development Costs (TDC)                                        | 23,300,675 |
| Profit (Loss) from Sales/Revenue                                     | 3,199,325  |
| Percentage of Profit (Loss) Over the Total Development Costs         | 13.73%     |
Required Attachments Relating to Section 5

5.1 New England Fund Lender Letter of Interest (required for projects with NEF financing)

Please attach a Letter of Interest from a current Federal Home Loan Bank of Boston (FHLBB) member bank regarding financing for the proposed development. The letter of interest must include, at a minimum, the following:

- Identification of proposed borrower, and brief description of the bank's familiarity with the borrower;
- Brief description of the Proposed Project, including location, number of units, and type of building (townhouse, garden style, etc.);
- Confirmation that the bank is a current FHLBB member bank and that the bank will specifically use NEF funds for the proposed development.

*NOTE: Binding Construction and Permanent Financing Commitments (or evidence of closed loans) will be required at the time you apply for Final Approval from MassHousing.*

5.2 Market Sale Comparables (required)

Please provide a listing of market sales being achieved in properties comparable to the proposed project.

5.3 Market Study (if available)

MassHousing may require a market study at Final Approval for projects located in areas where the need or demand for the type of housing being proposed cannot be clearly demonstrated.
Application for Chapter 40B Project Eligibility/Site Approval for MassHousing-Financed and New England Fund ("NEF") Homeownership Projects

Section 6: APPLICANT QUALIFICATIONS, ENTITY INFORMATION AND CERTIFICATION

In order to issue Site Approval, MassHousing must find (as required by 760 CRM 56.04 (4)) that the applicant is either a non-profit public agency or would be eligible to apply as a Limited Dividend Organization and meets the general eligibility standards of the program.

Name of Proposed Project: River Marsh Village

Development Team
Developer/Applicant: Brian Murphy River Marsh, LLC
Development Consultant (if any):
Attorney: Warren Baker
Architect: Axiom Architects
Contractor: Norwell Construction, LLC
Lottery Agent: Delphic Associates
Management Agent:
Other (specify):
Other (specify):

Role of Applicant in Current Proposal

<table>
<thead>
<tr>
<th>Development Task</th>
<th>Developer/Applicant</th>
<th>Development Consultant (Identify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture and Engineering</td>
<td>River Marsh LLC</td>
<td>Axiom Architects and Mckenzie Engineering</td>
</tr>
<tr>
<td>Local Permitting</td>
<td>River Marsh LLC</td>
<td>Warren Baker</td>
</tr>
<tr>
<td>Financing Package</td>
<td>River Marsh LLC</td>
<td>South Shore Bank</td>
</tr>
<tr>
<td>Construction Management</td>
<td>River Marsh LLC</td>
<td>TBD</td>
</tr>
<tr>
<td>Other</td>
<td>River Marsh LLC</td>
<td>TBD</td>
</tr>
</tbody>
</table>

Applicant's Ownership Entity Information

Please identify for each of (i) the Applicant and, if different (ii) the Proposed Development Entity, the following (collectively with the Applicant and the Proposed Development Entity, the "Applicant Entities"): the Managing Entities, Principals, Controlling Entities and Affiliates of each.

Note: For the purposes hereof, "Managing Entities" shall include all persons and entities (e.g., natural persons, corporations, partnerships, limited liability companies, etc., including beneficiaries of nominee trusts) who are managers of limited liability companies, general partners of limited partnerships, managing general partners of limited liability partnerships, directors and officers of corporations, trustees of trusts, and other similar persons and entities that have the power to manage and control the activities of the Applicant and/or Proposed Development Entity.
"Principal or Controlling Entities" shall include all persons and entities (e.g., natural persons, corporations, partnerships, limited liability companies, etc., including beneficiaries of nominee trusts) that shall have the right to

(i) approve the terms and conditions of any proposed purchase, sale or mortgage;
(ii) approve the appointment of a property manager; and/or
(iii) approve managerial decisions other than a decision to liquidate, file for bankruptcy or incur additional indebtedness.

Such rights may be exercisable either (i) directly as a result of such person’s or entity’s role within the Applicant or the Proposed Development Entity or the Managing Entities of either or (ii) indirectly through other entities that are included within the organizational structure of the Applicant and/or Proposed Development Entity and the Managing Entities of either.

In considering an application, MassHousing will presume that there is at least one Principal or Controlling Entity of the Applicant and of the Proposed Development Entity. Any person or persons who have purchased an interest for fair market value in the Applicant and/or Proposed Development Entity solely for investment purposes shall not be deemed a Principal or Controlling Entity.

"Affiliates" shall include all entities that are related to the subject organization by reason of common control, financial interdependence or other means.

Applicant
Name of Applicant: River Marsh, LLC

Entity Type (limited liability company, limited partnership, limited liability partnership, corporation, trust, etc.): LLC

State in which registered/formed: MA

List all Managing Entities of Applicant (you must list at least one): Brian Murphy

List all Principals and Controlling Entities of Applicant and (unless the Managing Entity is an individual) its Managing Entities (use additional pages as necessary): Brian Murphy

List all Affiliates of Applicant and its Managing Entities (use additional pages as necessary):
Proposed Development Entity

Name of Proposed Development Entity: River Marsh, LLC

Entity Type (limited liability company, limited partnership, limited liability partnership, corporation, trust, etc.): LLC

State in which registered/formed: MA

List all Managing Entities of Proposed Development Entity (you must list at least one):
Brian Murphy

List all Principals and Controlling Entities of Proposed Development Entity and (unless the Managing Entity is an individual) its Managing Entities (use additional pages as necessary):

List all Affiliates of Proposed Development Entity and its Managing Entities (use additional pages as necessary):

Applicant Entity 40B Experience

Please identify every Chapter 40B project in which the Applicant or any Applicant Entity (as defined above) has or had an interest. For each such project, state whether the construction has been completed and whether cost examination has been submitted (use additional pages as necessary).

<table>
<thead>
<tr>
<th>40B Project</th>
<th>Municipality</th>
<th>Number of Units/Type</th>
<th>Year Completed</th>
<th>Cost Cert Submitted?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington Woods</td>
<td>Norwell</td>
<td>40 For Sale Condos</td>
<td>Ongoing</td>
<td>No</td>
</tr>
<tr>
<td>White Barn Lane</td>
<td>Norwell</td>
<td>36 For Sale Condos</td>
<td>Ongoing</td>
<td>No</td>
</tr>
<tr>
<td>Simon Hill</td>
<td>Norwell</td>
<td>126 Apartments</td>
<td>Ongoing</td>
<td>No</td>
</tr>
<tr>
<td>Woodland Village</td>
<td>Hanover</td>
<td>200 Apartments</td>
<td>Ongoing</td>
<td>No</td>
</tr>
<tr>
<td>River Stone</td>
<td>Hingham</td>
<td>36 For Sale Condos</td>
<td>Ongoing</td>
<td>No</td>
</tr>
</tbody>
</table>
Certification

I hereby certify on behalf of the Applicant, under pain and penalties of perjury, that the information provided above for each of the Applicant Entities is to the best of my knowledge, true and complete; and that each of the following questions has been answered correctly to the best of my knowledge and belief:

(Please attach a written explanation for all of the following questions that are answered with a "Yes". Explanations should be attached to this Section 6.)

Is there pending litigation with respect to any of the Applicant Entities? Yes ☐  No ☑

Are there any outstanding liens or judgments against any properties owned by any of the Applicant Entities? Yes ☐  No ☑

Have any of the Applicant Entities failed to comply with provisions of Massachusetts law related to taxes, reporting of employees and contractors, or withholding of child support? Yes ☐  No ☑

Have any of the Applicant Entities ever been the subject of a felony indictment or conviction? Yes ☐  No ☑

During the last 10 years, have any of the Applicant Entities ever been a defendant in a lawsuit involving fraud, gross negligence, misrepresentation, dishonesty, breach of fiduciary responsibility or bankruptcy? Yes ☐  No ☑

Have any of the Applicant Entities failed to carry out obligations in connection with a Comprehensive Permit issued pursuant to M.G.L. c. 40B and any regulations or guidelines promulgated thereunder (whether or not MassHousing is or was the Subsidizing Agency/Project Administrator) including, but not limited to, completion of a cost examination and return of any excess profits or distributions? Yes ☐  No ☑

Have any of the Applicant Entities ever been charged with a violation of state or federal fair housing requirements? Yes ☐  No ☑

Are any of the Applicant Entities not current on all existing obligations to the Commonwealth of Massachusetts, and any agency, authority or instrument thereof? Yes ☐  No ☑

I further certify that the information set forth set forth in this application (including attachments) is true, accurate and complete as of the date hereof to the best of my knowledge, information and belief. I further understand that MassHousing is relying on this information in processing the request for Site Approval in connection with the above-referenced project; and

I further certify that we have met with a representative of the 40B Department at MassHousing and understand the requirements for a) completing this application and b) the procedures if and when Site Approval is granted, including the requirement for (i) the use of the standard MassHousing Regulatory Agreement, (ii) submission to MassHousing, within one hundred eighty (180) days after substantial completion or, if later, within ninety (90) days of the date on which all units are sold, of a cost certification examined in accordance with AICPA attestation standards by an approved certified public accountant and (iii) the posting of surety for completion of the cost certification as a condition of Final Approval by MassHousing under Chapter 40B.

Signature: ________________________________
Name: Brian Murphy for River Marsh, LLC
Title:  Manager
Date: 11/30/2016

40B Site Approval Application 8/14
Required Attachments Relating to Section 6

6.1 Development Team Qualifications
Please attach resumes for principal team members (Applicant, consultant, attorney, architect, general contractor, management agent, lottery agent, etc.) and list of all relevant project experience for 1) the team as a whole and 2) individual team members. Particular attention should be given to demonstrating experience with (i) projects of a similar scale and complexity of site conditions, (ii) permitting an affordable housing development, (iii) design, and (iv) financing. The development team should demonstrate the ability to perform as proposed and to complete the project in a competent and timely manner, including the ability to pursue and carry out permitting, financing, marketing, design and construction.

(If the Applicant (or, if the Applicant is a single purpose entity, its parent developer entity) has received financing from MassHousing within the past five (5) years for a development of comparable size and complexity to the Proposed Project, no resume or list of project experience need be submitted for the Applicant or, as applicable, its parent developer entity. Information regarding the other team members still will be required.)

6.2 Applicant's Certification
Please attach any additional sheets and any written explanations for questions answered with "yes" as required for Certification.
Application for Chapter 40B Project Eligibility/Site Approval
for MassHousing-Financed and New England Fund (“NEF”) Homeownership Projects

Section 7: NOTIFICATIONS AND FEES

Name of Proposed Project: River Marsh, LLC

Notice
Date(s) of meetings, if any, with municipal officials prior to submission of
application to MassHousing:

Date copy of complete application sent to chief elected office of municipality:

Date notice of application sent to DHCD:

Fees (all fees should be payable to MassHousing)
MassHousing Application Processing Fee ($2500):
2,500
Chapter 40B Technical Assistance/Mediation Fee
a. Base Fee:
   (Limited Dividend Sponsor $2500, Non-Profit or Public Agency Sponsor $1,000)
   2,500
b. Unit Fee (all projects) $30 per Unit:
   2,040
Total TA/Mediation Fee (Base Fee plus Unit Fee):
3,580
Total Fees Due:
6080

Land Appraisal Cost
You will be required to pay for an "as-is" market value appraisal of the site to be commissioned by MassHousing.
MassHousing will contact you once a quote has been received for the cost of the appraisal.
Required Attachments Relating to Section 7

7.1 Narrative describing any prior correspondence and/or meetings with municipal officials

7.2 Evidence (such as a certified mail receipt) that a copy of the complete application package was sent to the chief elected official of municipality (may be submitted after the application is submitted to MassHousing)

7.3 Copy of notice of application sent to DHCD

7.4 Check made payable to MassHousing for Processing Fee ($2500)

7.5 Check made payable to MassHousing for Technical Assistance/Mediation Fee

7.6 W-9 (Taxpayer Identification Number)
Application Checklist:

The documentation listed below must, where applicable, accompany each application. For detailed descriptions of these required documents, please see the relevant sections of the application form.

* Applications missing any of the documents indicated by an asterisk will not be processed by MassHousing until MassHousing receives the missing item(s).

☐ * Completed application form, and certification under pains and penalties of perjury (one (1) signed original accompanied by two (2) copies of the complete application package)

☐ * Location Map

☐ Tax Map

☐ * Directions to the Proposed Site

☐ * Existing Conditions Plan

☐ Aerial Photographs

☐ Site/Context Photographs

☐ * Documentation Regarding Site Characteristics/Constraints

☐ * By Right Site Plan, if applicable

☐ * Preliminary Site Layout Plan(s)

☐ * Graphic Representations of Project/Preliminary Architectural Plans

☐ * Narrative Description of Design Approach

☐ * Tabular Zoning Analysis

☐ Sustainable Development Principles Evaluation Assessment Form

☐ * Evidence of Site Control (documents and any plans referenced therein)

☐ Land Disposition Agreement, if applicable

☐ * NEF Lender Letter of Interest

☐ Market Sales Comparables

☐ Market Study, if required by MassHousing

☐ * Development Team Qualifications

☐ Applicant’s Certification (any required additional sheets)

☐ Narrative describing prior contact (if any) with municipal officials

☐ * Evidence that a copy of the application package has been received by the chief elected official in the municipality (may follow after initial submission of application package, but site visit will not be scheduled nor request for municipal comments made until such evidence is received by MassHousing)

☐ Copy of Notification Letter to DHCD

☐ * Fees ($5,000 plus $30 per unit of housing proposed) payable to MassHousing (once an appraiser has been selected by MassHousing and an appraisal fee quoted, an additional non-refundable appraisal fee will be required)
[ATTACH SUSTAINABLE DEVELOPMENT SCORECARD HERE]
December 30, 2016

Mr. Gregory Watson  
Manager of the Comprehensive Permit Program  
MassHousing  
One Beacon Street  
Boston, MA 02108

RE: RIVER MARSH, LLC  
PEMBROKE, MASSACHUSETTS  
MASSHousing HOUSING STARTS APPLICATION  
DEVELOPMENT NARRATIVE

Dear Mr. Watson:

River Marsh, LLC, of Pembroke, Massachusetts, hereby submits an application for a 'Site Eligibility Letter' to be issued by MassHousing for a development to be known as River Marsh Village. We met with Michael Busby on December 7, 2016 to review and get initial feedback.

The Developers have created the entity known as River Marsh, LLC for the sole purpose of developing River Marsh, a multi-family housing development in accordance with M.G.L 40B, §20-23. This entity shall execute a Regulatory Agreement to be entered into by and between itself, the community, and the lender, thereby creating a "Limited Dividend Organization".

The Town of Pembroke is a South Shore suburban community with a mostly residential character. It is bordered by Norwell to the North, Hanover and Hanson to the West, Duxbury and Marshfield to the East, and Kingston to the South. Pembroke is in a convenient location at approximately 10 miles East of Brockton, 15 miles North of Plymouth, and 30 miles South of Boston.

The total land area is 23.5 square miles with a population of 17,837. According to the Department of Housing and Community Development's 2014 Ch. 40B subsidized Housing Inventory, the Town of Pembroke has 6,447 year round housing units, with 625 units included in its subsidized Housing Inventory for a total of 9.6% of its housing stock.

Existing Site Conditions

This project consists of approximately 49.94 acres of land and has frontage on Water Street in Pembroke. The development will be comprised of two parcels which are shown on the
Assessor’s map E15 lot 17 and map E15 lot 17A. The site is surrounded by developed residential lots on Water Street to the South, East and West, and the North River to the North.

The site is located within the Residence District A zoning district and is comprised of 18.54 acres of upland and 31.4 acres of wetland area. A single family colonial style home is located on parcel E15-17A whereas parcel E15-17 is undeveloped land. The undeveloped land consists of wooded and grassed areas with a relatively flat topography.

Proposed Project

The proposed development will consist of 68 non-age restricted condominium units comprised of 3, 4 and 5 unit buildings with bituminous concrete access driveways and associated infrastructure. Visitor and guest parking will be dispersed throughout the site. Access to the site will be provided by two access points from Water Street.

The condominiums will be designed to range in square footage from 1,500 to 2,100 square feet. The design will blend with the neighborhood and the town of Pembroke as a whole.

The project will access the utility infrastructure located on Water Street, including water, electric, telephone, gas and cable television. A wastewater treatment plant will be constructed to manage sewerage flows on-site. The stormwater management system will be designed to fully comply with all the standards of the Department of Environmental Protection’s Stormwater Management Policy.

Affordability Component

We are proposing that twenty five (25%) percent, or nine units, will be identified as affordable units and will blend with the proposed market rate homes and will be evenly distributed throughout the development.

The affordable homes will be marketed to households whose income does not exceed eighty (80%) percent of the area median income, as defined by the Department of Housing and Urban Development.

The sale price for the affordable homes shall be calculated assuming a down payment five (5%) percent of the approved sales price with a total payment for principal, interest, mortgage insurance premiums, property taxes, property insurance and condominium association fees, if any, not to exceed thirty (30%) percent, of a household whose income is seventy (70%) percent of the area median income. Using the above formula and based on the more recent median income as published by HUD, the exact sales prices for the affordable units is to be determined.

It is hopeful that a permit can be issued by the local Zoning Board of Appeals, whereby residents of Pembroke will receive a preference for up to seventy (70%) percent of the affordable units (70% of 9 units is 6). Preference can be determined, regulated and coordinated by the Developer, monitoring agent and the community to include existing local residents, siblings, parents, and offspring of local residents, in addition to municipal workers.

The Applicant will conduct and also be responsible for the cost related to the marketing/lottery of the affordable units.
Thank you for your time in reviewing this application.

Sincerely,

[Signature]

Brian P. Murphy, Manager
River Marsh, LLC
November 30, 2016

Ms. Jane Chrystal Kornegay
Undersecretary Housing and Community Development
Department of Housing and Community Development
100 Cambridge Street, Suite 300
Boston, MA 02114

RE: COMPREHENSIVE PERMIT APPLICATION
RIVER MARSH, LLC
PEMBROKE, MASSACHUSETTS
PROJECT ELIGIBILITY LETTER

Dear Ms. Kornegay:

The purpose of this letter is to advise you that River Marsh, LLC is proposing a 68 unit apartment complex through M.G.L. 40B, §20-23 in the Town of Pembroke.

We have submitted an application for a site eligibility letter to MassHousing and, in accordance with 760 CMR §31.01(2)(a), we are hereby notifying the Department of Housing and Community Development of our request for a project eligibility letter through the Housing Starts program. Please find a copy of the application enclosed.

In addition, a copy is being forwarded to the Town of Pembroke Board of Selectmen.

If you have any questions, please contact me through phone (781-659-2255) or email brianmurphy@unicornrealty.com.

Sincerely,

[Signature]
Brian P. Murphy
River Marsh, LLC
Managing Member
RE: LISTING OF REQUESTED EXCEPTION AND WAIVERS

In accordance with the Town of Pembroke Rules and Regulations for Comprehensive Permits, a list of requested exceptions to local requirements, codes, bylaws, and regulations is provided herein.
Other Exemptions

In addition, pursuant to M.G.L. Chapter 40B and the regulations promulgated thereunder, the Project shall be exempt from all provisions of all other local by-laws, including without limitation, the following:

1. The Project shall be exempt from all provisions of the Pembroke Wetland Protection By-Law Article 22 of the General By-Laws and associated Rules and Regulations.

2. The Project shall be exempt from all provisions of the Pembroke Board of Health Rules and Regulations.

3. The Project shall be exempt from all provisions of the Pembroke Planning Boards Rules and Regulations adopted under the Subdivision Control Law.

4. The Project shall be exempt from the filing fee requirements established by the Zoning Boards of Appeals, Planning Boards, Conservation Commission, or other Town entities, except for fees specifically relating to Comprehensive Permit Applications.

5. The Project shall be exempt from any other applicable zoning or related municipal ordinances so far as the same may be at variance with the Project or the Site Development Plans or the Architectural Plans as filed.

In addition to the foregoing exceptions, the Applicant hereby requests that all exceptions from, and permits under, the Pembroke Zoning Bylaws and all other applicable bylaws, regulations, and local requirements of the Town of Pembroke be granted pursuant to its application, as may be necessary so that the Project can be built in accordance with submitted plans.
Pursuant to M.G.L., Ch. 40B and regulations adopted pursuant thereto the following use, dimensional and other local requirements or regulations shall be waived for the project and other such waivers necessary to construct the project as permitted. Without the requested waivers, the project could not be constructed. Following please find a table of the waivers necessary to permit the proposed project.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Requirement</th>
<th>Prohibited Use in Residence District A</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lot Area</td>
<td>Residence A: 40,000 (s.f.) (80% contiguous upland)</td>
<td>Residence A: 150 (ft.)</td>
<td>Unchanged</td>
</tr>
<tr>
<td>Lot Frontage</td>
<td>Residence A: 2.5 stories</td>
<td>Residence A: 40 (ft.)</td>
<td>Unchanged</td>
</tr>
<tr>
<td>Max. Height</td>
<td>Residence A: 40 (ft.)</td>
<td>Residence A: 40 (ft.)</td>
<td>40 ft.</td>
</tr>
<tr>
<td>F.Y. Setback</td>
<td>S.Y. Setback</td>
<td>Residence A: 20 (ft.)</td>
<td>Not specified</td>
</tr>
<tr>
<td>R.Y. Setback</td>
<td>Building Coverage</td>
<td>Residence A: 25 (ft.)</td>
<td>Not specified</td>
</tr>
<tr>
<td>FAR</td>
<td>Max Lot Coverage</td>
<td>Not specified</td>
<td>Not specified</td>
</tr>
<tr>
<td>Open Space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lot Width</td>
<td>Residential Use or District</td>
<td>General District Use or District</td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>100 ft. from the front line</td>
<td>Residential use or district</td>
<td></td>
</tr>
<tr>
<td>&lt;100 ft.</td>
<td>50 ft. of the rear lot line</td>
<td>Residential use or district</td>
<td></td>
</tr>
<tr>
<td>100 ft.</td>
<td>40 ft. of the side lot line</td>
<td>Residential use or district</td>
<td></td>
</tr>
<tr>
<td>17 ft.</td>
<td>30 ft. of the rear lots line</td>
<td>Residential use or district</td>
<td></td>
</tr>
<tr>
<td>19 ft.</td>
<td>15 ft. of the front line</td>
<td>Residential use or district</td>
<td></td>
</tr>
</tbody>
</table>

- N/A: Not Applicable
- "A": No building, no structure, no fence other than a post and rail
- "G": 3多功能 dwelling conditions (a thru c)
- "E": 3多功能 dwelling conditions (a thru c) Planned for by Planning Board
- "S": 3多功能 dwelling conditions (a thru c) Special Permits
- "D": 2多户 dwelling

- "C": 2.5多功能 dwelling
- "R": 2.5多功能 dwelling-Residents only
- "D": 2多功能 dwelling
- "C": 3多功能 dwelling
- "B": 3多功能 dwelling
- "A": 3多功能 dwelling

- "C": Commercial District - Multifamily
- "R": Commercial District - Residential
- "D": Commercial District - Multifamily
- "B": Commercial District - Multifamily
- "A": Commercial District - Multifamily

- "C": Commercial District - Multifamily
- "R": Commercial District - Residential
- "D": Commercial District - Multifamily
- "B": Commercial District - Multifamily
- "A": Commercial District - Multifamily

- "C": Commercial District - Multifamily
- "R": Commercial District - Residential
- "D": Commercial District - Multifamily
- "B": Commercial District - Multifamily
- "A": Commercial District - Multifamily
<table>
<thead>
<tr>
<th>Appear Logical with MRLC.</th>
<th>G. Enforcement Procedure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Review by Planning Board of</td>
<td></td>
</tr>
<tr>
<td>G. Enforcement Procedure.</td>
<td></td>
</tr>
<tr>
<td>1. Street Parking Access</td>
<td>Section V-7 Site Plan Approval</td>
</tr>
<tr>
<td>2. Parking Spaces per Dwelling Unit</td>
<td></td>
</tr>
<tr>
<td>4 spaces per dwelling with 3ld</td>
<td></td>
</tr>
<tr>
<td>6 guest spaces = 25 spaces</td>
<td></td>
</tr>
<tr>
<td>Not Specified</td>
<td></td>
</tr>
<tr>
<td>IV-D.13. Buffer Strips</td>
<td></td>
</tr>
<tr>
<td>&gt;50%</td>
<td>IV-D.14. Landscaping</td>
</tr>
<tr>
<td>&gt;40%</td>
<td>IV-D.13. Coverage</td>
</tr>
<tr>
<td>&gt;30%</td>
<td>IV-D.12. Building Floor Area</td>
</tr>
<tr>
<td>N/A</td>
<td>IV-D.11. Driveways</td>
</tr>
<tr>
<td>9.7%</td>
<td></td>
</tr>
<tr>
<td>5.3%</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Along any lot line abutting a residential use or district, there shall be landscaped or left in a natural state.

50% of any yard or buffer strip abutting residential use or district.

40% of any required yard shall be landscaped or left in a natural state.

Shall not exceed 50% of the total site area.

Shall not exceed 35% of the total site area.

Driveways providing a means of access for each individual lot.
<table>
<thead>
<tr>
<th>Waiver of Requirement</th>
<th>Regulations/Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compliance with Planning Board Regulations (40 CFR 121)</td>
</tr>
<tr>
<td></td>
<td>Compliance with Commission Regulations (40 CFR 121)</td>
</tr>
<tr>
<td></td>
<td>Compliance with Commission Regulations (40 CFR 121)</td>
</tr>
<tr>
<td></td>
<td>Design and Operational Control Plan</td>
</tr>
<tr>
<td></td>
<td>Section 4.3 C</td>
</tr>
<tr>
<td></td>
<td>Entire Section</td>
</tr>
<tr>
<td></td>
<td>Entire Section</td>
</tr>
<tr>
<td></td>
<td>Entire Section</td>
</tr>
<tr>
<td></td>
<td>Entire Section</td>
</tr>
</tbody>
</table>

**Section 7 - Post-Construction Site**

**Proposed Regeneration Criteria**

The project could not be constructed. Following please find a table of the waivers necessary to permit the proposed project: The project's design will be reviewed and approved by the Conservation Commission in accordance with the Mass. Wetlands Protection Act.

**Il. Permitted Stormwater Management By-law Article XXXY of the General By-laws and associated Rules and Regulations**

In addition, pursuant to MGL Chapter 40B, Section 20-23 and the regulations promulgated thereunder, the project shall be exempt from all

**Other Exemptions**

...
<table>
<thead>
<tr>
<th>Proposed Criteria</th>
<th>Criteria for Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>An Application for Permit &quot;No Permit Shall Remove, Fill, Dredge,&quot; submitted for a permit.</td>
<td></td>
</tr>
</tbody>
</table>

**Article 3 - Application for Permit**

A property owner who submits an application for a permit shall remove, fill, or dredge the proposal.

The project's design will be reviewed and approved by the Conservation Commission in accordance with the Mass. Wetlands Protection Act of 1972. For additional information, please refer to the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131 s.40) and its regulations (310 CMR 02.00). Without the requested waivers, the project could not be constructed.

Please find a table of the waivers necessary to permit the proposed project:

<table>
<thead>
<tr>
<th>Category</th>
<th>Waiver of Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey - Entire Section</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Text</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Article 6 - Security</strong></td>
<td>The commission may require as a permit condition that one or both of the following methods secure the performance and observance of other conditions:</td>
</tr>
<tr>
<td></td>
<td>a. By bond or deposit of money or negotiable securities in an amount determined by the commission to be sufficient.</td>
</tr>
<tr>
<td></td>
<td>b. By a bond or deposit of money or negotiable securities in an amount required by the commission.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chapter</strong></td>
<td>Where no conditions are adequate to protect those values, effects upon the values located or protected by this chapter and other requirements of regulations of the commission for meet the requirements of this chapter, for failure to submit necessary information and plans required by the commission, for failure to meet the design specifications, for failure to meet the performance standards, or failure to meet the engineering standards for design, engineering, and construction, the commission is empowered to deny a permit for failure to meet the requirements of this chapter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Article 5 - Permit and Conditions</strong></td>
<td>D. Filing Fees.</td>
</tr>
<tr>
<td></td>
<td>open bottom arch culvert with headwalls.</td>
</tr>
<tr>
<td>Design Criteria</td>
<td>Requirement</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Family Dwelling, multiple per bedroom – 150 GPD</td>
<td>Proposed</td>
</tr>
<tr>
<td>3.2.23 Distribution Ponds</td>
<td></td>
</tr>
<tr>
<td>3.2.47 Aggregate</td>
<td></td>
</tr>
</tbody>
</table>

The project's design will be reviewed and approved by the Board of Health in accordance with the Mass. DEP Environmental Code Title 5 310 CMR 15.00. Without the required waivers, the project could not be constructed. Following please find a table of the waivers necessary to permit the proposed project.

### Article 7 – Rules and Regulations Exculsive to Pembroke, MA

#### Waiver of this Requirement

<table>
<thead>
<tr>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present additional evidence to enable the applicant or other interested parties to demonstrate that the proposed project will have a minimal adverse impact on health, safety or the environment</td>
</tr>
</tbody>
</table>

#### Article 9 – Waiver of Prior Approval

The applicant shall have the burden of providing by a preponderance of the credible evidence that the work proposed in the application will not have an adverse impact on health, safety or the environment.
IV. Pembroke Planning Board Rules and Regulations Governing the Issuance of Site Plan Approval

| Proposed Plan Review by Zoning Board of | Entire Section | 11 - Application
|----------------------------------------|----------------|-------------------|
| Under 49B and Regulations for Plans Consistent with M.C.L. | Entire Section | 88-01-12.04
| Permit No. 318-312, DEP Groundwater Discharge | Entire Section | 90-60-04
| DEP Groundwater Discharge (320 CMR 15.00) of the Mass. | Entire Section | BOARD OF HEALTH REGULATION
| Environmental Code Title 5 | "Adopts the following fee schedule for Disposal Works Permit" | 15.253 - Pits, Galleries, or Chambers
| Waver of These Requirements. | "Adopts the following fee schedule for Disposal Works Permit" | 15.252 Trenches
| Wave of Required Fees. | 15.252 Trenches | Provided "

1. Minimum dimension of each distribution line shall be four inches. Between trenches can be used, as allowed in Title 4, Area.
2. Minimum dimension of each distribution line shall be four inches. Between trenches can be used, as allowed in Title 4, Area.
3. System Reserve Area. A Reserve area must be sufficient to replace the capacity of the original trenching area.
4. The area between the trenches shall not be designated as
5. Waver of Required Fees.
the Project or the Site Development Plans or the Architectural Plans as filed.

VI. The Project shall be exempt from any other applicable zoning or related municipal ordinances so far as the same may be at variance with
Commission, or other Town entity, except for fees specifically relating to Comprehensive Permit Applications.

<table>
<thead>
<tr>
<th>Plan Review by Zoning Board of Appeals consistent with M.G.L.</th>
<th>Entire Section</th>
<th>Statement</th>
<th>Development Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan Review by Zoning Board of Appeals consistent with M.G.L.</td>
<td>Entire Section</td>
<td>Section V - Requirements</td>
<td></td>
</tr>
<tr>
<td>Plan Review by Zoning Board of Appeals consistent with M.G.L.</td>
<td>Entire Section</td>
<td>Section IV - Site Plan Content</td>
<td></td>
</tr>
<tr>
<td>Plan Review by Zoning Board of Appeals consistent with M.G.L.</td>
<td>Entire Section</td>
<td>Section III - Procedures</td>
<td></td>
</tr>
</tbody>
</table>
RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLICATION

TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

RE. FILING FEE

In accordance with Town of Pembroke Rules and Regulations for Comprehensive Permits, a filing fee in the amount of $3,800 has been provided by separate attachment, and such filing fee is incorporated into and made part of this application.

The filing fee is calculated as follows: 56 units x $50 = $2,800 + $1,000 = $3,800
RIVER MARSH – PEMBROKE MA
COMPREHENSIVE PERMIT APPLICATION

TOWN OF PEMBROKE, MASSACHUSETTS
ZONING BOARD OF APPEALS

RE: DEVELOPMENT TEAM

The following is a list of the River Marsh development team members:

Developer
River Marsh LLC
Brian Murphy, Manager
293R Washington Street
Norwell, MA 02061
(781) 659-2255

Contract/Builder
W.J. Murphy Construction Co., Inc.
Brian Murphy, Manager
293R Washington Street
Norwell, MA 02061
(781) 659-2255

Architect
Axiom Architects, Inc.
Jim Kelleher
2048 Washington Street #12
Hanover, MA 02339
(781) 871-2101

Engineer
McKenzie Engineering, Inc.
Brad McKenzie
150 Longwater Drive
Norwell, MA 02061
(781) 792-3906
Marketing Agent
Affordable Units
To be Determined

Marketing Agent
Market Rate Units
To be Determined

Consultant
Baker, Braverman & Barbadoro, P.C.
300 Crown Colony Drive, Suite 500
Quincy, MA 02169-0904
(781) 848-9610
RE: APPLICANT’S PRIOR DEVELOPMENT PROJECTS

The Applicant is an entity created for the sole purpose of developing River Marsh, a multi-family housing development in accordance with M.G.L. 40B, § 20-23, and therefore it has not completed any projects.

The Development Team behind the Applicant has successfully constructed commercial developments and residential developments that are similar in nature, such as Washington Woods that consists of seven residential buildings and associated site work on approximately 10 acres off Washington Street (Route 53) in Norwell, Massachusetts.
DRAINAGE CALCULATIONS AND STORMWATER MANAGEMENT PLAN

For:
COMPREHENSIVE PERMIT PLAN
RIVER MARSH VILLAGE
PEMBROKE, MA

Located:
0 WATER STREET
(ASSESSOR’S MAP E-17, LOT 0 & E-17A, LOT 274)
PEMBROKE, MASSACHUSETTS

Submitted to:
TOWN OF PEMBROKE

Prepared For:
RIVER MARSH, LLC
293R WASHINGTON STREET
NORWELL, MA 02061

SEPTEMBER 7, 2018
# TABLE OF CONTENTS

1. **NARRATIVE**
   - Project Summary 1
   - Pre-Development Condition 1
   - Post-Development Condition 3
   - Figure 1 (USGS Locus Map) 5
   - Figure 2 (FEMA Flood Map) 6
   - Figure 3 (SCS Soils Map) 7

2. **APPENDICES**
   - APPENDIX A: Pre-Development Condition
   - APPENDIX B: Post-Development Condition
Preliminary Hydrologic Analysis
Comprehensive Permit Plan
River March Village
Pembroke, Massachusetts

Project Summary
The project proponent River Marsh, LLC, proposes to develop an approximate 49.94-acre parcel of land located at 0 Water Street (Assessor’s Map E-17, Lot 0 and E-17A, Lot 274) in Pembroke, Massachusetts. The development is being permitted under MGL Ch. 40B Comprehensive Permit and will consist of 56 condominium units comprised of 3, 4, and 5-unit buildings. The proposed development will involve the construction of approximately 2,422 linear feet of bituminous roadways, residential buildings, driveways, stormwater management system, utilities and other related infrastructure.

The development will be comprised of two parcels which are shown on the Assessor’s Map E-17, Lot 0 and E-17A, Lot 274. The site is located between the North River to the west and Water Street, at the intersection of Church Street (Route 139) to the east in Pembroke, Massachusetts. Virtually the entire site is within the Residence “A” Zoning District. Access to the site is from the east off Water Street and through the Business “B” Zoning District. Approximately 10,700 +/- square feet are in the Business “B” Zoning District. Within less than one mile east of the property, is an Industrial Zone ‘B’ developed area, which abuts Pilgrims Highway (Massachusetts State Route 3). Homes within the immediate area are generally colonial-style, wooded-framed structures. Refer to Figure 1- USGS Locus Map for the location of the parcel.

The project will access utility infrastructure located on Water Street including electric, water, telephone and cable television. The lots will be served by a shared subsurface sewage disposal system with a pump chamber and connections to the municipal water system which will extend from Water Street throughout the proposed development. All stormwater management facilities will be designed provide renovation of stormwater and meet the requirements of the Department of Environment Protection’s Stormwater Management Regulations. The existing and proposed site conditions are illustrated on the project site plans entitled “River March Village, Comprehensive Permit Plan, Water Street, Pembroke, Massachusetts”, prepared by McKenzie Engineering Group, Inc. dated September, 2018.

This report contains preliminary stormwater runoff calculations for the pre-development and post-development conditions and includes the sizing of the proposed low impact drainage system and stormwater best management practices (BMPs).

Pre-Development Condition
The site is located primarily within the Residence “A” Zoning District and is comprised of 22.53 acres of upland and 27.41 acres of wetland. The Pembroke Conservation Commission has confirmed the wetland resource area by issuance of an Order of Resource Area Delineation (ORAD) dated June 3, 2003 for DEP File #5E 56-732. The wetland that was approved under this ORAD, is classified as a tidal wetland. Per the Massachusetts Stormwater Handbook Standard 2 (Reduce Peak Rate Discharge) may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.
One single family home currently exists on parcel Map E-17A Lot 274, which is to be retained. The project site is partially wooded and partially cleared with grass cover and wetlands toward the west side of the site approaching the North River. No improvements have been made to the land. The topography of the site is varied with elevations ranging from 30’ along the eastern boundary of the parcel of 5’ mean sea level (MSL) at the natural riverbank of the North River. Slopes vary from gentle to somewhat steeper grades sloping toward the wetlands on the west side of the site.

Review of available environmental databases such as MassGIS reveals that the site is not located within a mapped Natural Heritage Area, a Zone II or Zone III Groundwater Recharge Area, an Interim Wellhead Protection Area (IWPA), or a Contributing Watershed to Outstanding Resource Water (ORW). Review of the Town of Pembroke’s Zoning Map reveals that the site is not located within any other protection area.

The site is within Zone AE (Elevation 8) and Zone X of the Flood Insurance Rate Map, as shown on the current FEMA Flood Insurance Rate Map Panel Nos. 25023C0206J and 25023C0207J with an effective date of July 17, 2012. Refer to Figure 2 – FEMA Flood Map.

The Natural Resources Conservation Service (NRCS) has identified the soil on the site as Scarboro, Ipswich, Squamscott, Eldridge, Hinckley, Merrimac, Windsor and Deerfield soils. The soils range in hydrological soil group classifications from 'A' to 'D'. In addition to the NRCS information, subsurface exploration has been conducted by R.H. Cole & Associate in July of 1992 and September of 1993. The deep observation holes revealed primarily fine to coarse sand (HSG A) throughout the upland areas of the site. Refer to Figure 3 – Soil Map.

The existing watershed analyzed in this report is comprised of approximately 18.5 acres and consists of three (3) sub-catchments. Refer to the Pre-Development Watershed Plan WS-1 in Appendix A for a delineation of drainage subcatchments for the pre-development design condition.

The SCS Technical Release 20 (TR-20) and Technical Release 55 (TR-55) method-based program “HydroCAD” was employed to develop pre- and post-development peak flows. Drainage calculations were prepared for the pre-development condition for the 2, 10, 25 and 100-year, Type III storm events. Refer to Appendix A for computer results, soil characteristics, cover descriptions and times of concentrations for all subareas.
The peak rates of runoff and elevations for this condition are as follows:

<table>
<thead>
<tr>
<th>Table 1 – Pre-Development Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Design Storm (flow in cfs)</td>
</tr>
<tr>
<td>2-Year Storm</td>
</tr>
<tr>
<td>Design Point</td>
</tr>
<tr>
<td>DP-1</td>
</tr>
<tr>
<td>DP-2</td>
</tr>
</tbody>
</table>

|                                   |
| Design Storm (volume in ac-ft)    |
| 2-Year Storm | 10-Year Storm | 25-Year Storm | 100-Year Storm |
| Design Point | Volume (AC-FT) | Volume (AC-FT) | Volume (AC-FT) | Volume (AC-FT) |
| DP-1    | 0.129         | 0.518         | 0.924          | 1.733          |
| DP-2    | 0.006         | 0.043         | 0.084          | 0.169          |

**Post-Development Condition**

The proposed development will consist of 56 condominium units comprised of 3, 4, and 5-unit buildings with bituminous concrete access roadways, parking areas and associated infrastructure. Visitor parking will be dispersed throughout the site. Access to the site will be provided by a private 22 ft. wide roadway with two access points from Water Street.

Watershed areas were analyzed in the post-development condition to design low impact stormwater management facilities to mitigate impacts resulting from developing the property. The objective in designing the proposed drainage facilities for the project was to maintain existing drainage patterns to the extent practicable and to ensure that the post-development rates of runoff are less than pre-development rates at the design points.

Refer to the Post-Development Watershed Plan WS-2 in Appendix B for a delineation of post-development drainage subareas. The design points for the post-development design conditions correspond to those analyzed for the pre-development design condition.

Drainage calculations were prepared by employing the SCS TR-20 Methods for the 2, 10, 25 and 100-year, type III storm events. Refer to Appendix B for computer results. The subsurface infiltration chambers were designed to accommodate peak flows generated by all storms up to and including the 100-year storm event. Refer to site plans for the drainage system design.
The peak rates of runoff and elevations for this condition are as follows:

<table>
<thead>
<tr>
<th>Table 2 – Post-Development Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Design Storm (flow in cfs)</strong></td>
</tr>
<tr>
<td>2-Year Storm</td>
</tr>
<tr>
<td>Design Point</td>
</tr>
<tr>
<td>DP-1</td>
</tr>
<tr>
<td>DP-2</td>
</tr>
</tbody>
</table>

|                                    |
| Design Storm (volume in ac-ft)     |
| 2-Year Storm | 10-Year Storm | 25-Year Storm | 100-Year Storm |
| Design Point | Volume (AC-FT) | Volume (AC-FT) | Volume (AC-FT) | Volume (AC-FT) |
| DP-1        | 0.000         | 0.519         | 1.107         | 2.174         |
| DP-2        | 0.000         | 0.001         | 0.005         | 0.014         |

Although exempt from Standard 2 – Peak Rate Discharges, because discharge is to land subject to coastal storm flowage, a comparison of the pre-development and post-development peak rates of runoff indicate that the peak rates of runoff for the post-development condition at all Design Points will be less than the pre-development condition for all storm events.
SITE

U.S. GEOLOGICAL SURVEY
7.5X15 MINUTE SERIES

SITE

ROUTE 3
WATER STREET
CHURCH STREET

Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333
www.mckeng.com

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APPENDIX A

Pre-Development Condition
### Area Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>CN</th>
<th>Description</th>
<th>Subcatchment-numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.270</td>
<td>49</td>
<td>50-75% Grass cover, Fair, HSG A</td>
<td>(E3)</td>
</tr>
<tr>
<td>0.018</td>
<td>98</td>
<td>Paved parking, HSG A</td>
<td>(E3)</td>
</tr>
<tr>
<td>4.362</td>
<td>36</td>
<td>Woods, Fair, HSG A</td>
<td>(E1)</td>
</tr>
<tr>
<td>7.986</td>
<td>30</td>
<td>Woods, Good, HSG A</td>
<td>(E2, E3)</td>
</tr>
<tr>
<td>5.922</td>
<td>70</td>
<td>Woods, Good, HSG C</td>
<td>(E2, E3)</td>
</tr>
<tr>
<td><strong>18.558</strong></td>
<td><strong>45</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
</tbody>
</table>
Soil Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>Soil</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.636</td>
<td>HSG A</td>
<td>E1, E2, E3</td>
</tr>
<tr>
<td>0.000</td>
<td>HSG B</td>
<td></td>
</tr>
<tr>
<td>5.922</td>
<td>HSG C</td>
<td>E2, E3</td>
</tr>
<tr>
<td>0.000</td>
<td>HSG D</td>
<td></td>
</tr>
<tr>
<td>0.000</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>18.558</td>
<td>TOTAL AREA</td>
<td></td>
</tr>
</tbody>
</table>
## Ground Covers (all nodes)

<table>
<thead>
<tr>
<th>HSG-A (acres)</th>
<th>HSG-B (acres)</th>
<th>HSG-C (acres)</th>
<th>HSG-D (acres)</th>
<th>Other (acres)</th>
<th>Total (acres)</th>
<th>Ground Cover</th>
<th>Subcatchment Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.270</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.270</td>
<td>50-75% Grass cover, Fair</td>
<td>E3</td>
</tr>
<tr>
<td>0.018</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.018</td>
<td>Paved parking</td>
<td>E3</td>
</tr>
<tr>
<td>4.362</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>4.362</td>
<td>Woods, Fair</td>
<td>E1</td>
</tr>
<tr>
<td>7.986</td>
<td>0.000</td>
<td>5.922</td>
<td>0.000</td>
<td>0.000</td>
<td>13.908</td>
<td>Woods, Good</td>
<td>E2, E3</td>
</tr>
<tr>
<td><strong>12.636</strong></td>
<td><strong>0.000</strong></td>
<td><strong>5.922</strong></td>
<td><strong>0.000</strong></td>
<td><strong>0.000</strong></td>
<td><strong>18.558</strong></td>
<td><strong>TOTAL AREA</strong></td>
<td></td>
</tr>
</tbody>
</table>
### 215-181 PRE-DEV

Type III 24-hr 2-yr Rainfall=3.40"

Prepared by McKenzie Engineering Group, Inc.

HydroCAD® 10.00-21 s/n 00452 © 2018 HydroCAD Software Solutions LLC

Page 5

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

<table>
<thead>
<tr>
<th>Subcatchment</th>
<th>Property</th>
<th>Runoff Area</th>
<th>Impervious</th>
<th>Runoff Depth</th>
<th>Flow Length</th>
<th>Tc (min)</th>
<th>CN</th>
<th>Runoff</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>SW Property</td>
<td>190,029 sf</td>
<td>0.00%</td>
<td>0.00&quot;</td>
<td>406’</td>
<td>12.0</td>
<td>36</td>
<td>0.00 cfs</td>
</tr>
<tr>
<td>E2</td>
<td>Central Property</td>
<td>536,132 sf</td>
<td>0.00%</td>
<td>0.13&quot;</td>
<td>808’</td>
<td>17.9</td>
<td>48</td>
<td>0.22 cfs</td>
</tr>
<tr>
<td>E3</td>
<td>SE Property</td>
<td>82,214 sf</td>
<td>0.94%</td>
<td>0.04&quot;</td>
<td>290’</td>
<td>13.3</td>
<td>43</td>
<td>0.01 cfs</td>
</tr>
</tbody>
</table>

Reach DP-1: Wetland
- Inflow=0.22 cfs 0.129 af
- Outflow=0.22 cfs 0.129 af

Reach DP-2: Water St
- Inflow=0.01 cfs 0.006 af
- Outflow=0.01 cfs 0.006 af

**Total Runoff Area** = 18.558 ac  Runoff Volume = 0.136 af  Average Runoff Depth = 0.09"
99.90% Pervious = 18.540 ac  0.10% Impervious = 0.018 ac
Summary for Subcatchment E1: SW Property

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr  2-yr Rainfall=3.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>190,029</td>
<td>36</td>
<td>Woods, Fair, HSG A</td>
</tr>
<tr>
<td>190,029</td>
<td>100</td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2</td>
<td>50</td>
<td>0.0300</td>
<td>0.08</td>
<td></td>
<td><strong>Sheet Flow, START off property</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
</tr>
<tr>
<td>1.8</td>
<td>356</td>
<td>0.0400</td>
<td>3.22</td>
<td></td>
<td><strong>Shallow Concentrated Flow, To Wetland</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved  Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

| Total    | 406           |               |                   |                 |                                                  |

Subcatchment E1: SW Property

Type III 24-hr  2-yr Rainfall=3.40"
Runoff Area=190,029 sf
Runoff Volume=0.000 af
Runoff Depth=0.00"
Flow Length=406'
Tc=12.0 min
CN=36
Summary for Subcatchment E2: Central Property

Runoff = 0.22 cfs @ 13.77 hrs, Volume= 0.129 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>299,040</td>
<td>30</td>
<td>Woods, Good, HSG A</td>
</tr>
<tr>
<td>237,092</td>
<td>70</td>
<td>Woods, Good, HSG C</td>
</tr>
<tr>
<td>536,132</td>
<td>48</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>536,132</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.4</td>
<td>50</td>
<td>0.0150</td>
<td>0.06</td>
<td></td>
<td>Sheet Flow, A-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
</tr>
<tr>
<td>4.5</td>
<td>758</td>
<td>0.0310</td>
<td>2.83</td>
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<td>Shallow Concentrated Flow, B-C</td>
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<td>Unpaved Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

17.9 808 Total

Subcatchment E2: Central Property

Hydrograph
Summary for Subcatchment E3: SE Property

Runoff = 0.01 cfs @ 15.62 hrs, Volume= 0.006 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tbody>
<tr>
<td>48,838</td>
<td>30</td>
<td>Woods, Good, HSG A</td>
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<td>20,856</td>
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<td>43</td>
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<th>Tc (min)</th>
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<td>11.5</td>
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<td>Sheet Flow, A-B</td>
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<tr>
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<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
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<tr>
<td>1.8</td>
<td>240</td>
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<td></td>
<td>Shallow Concentrated Flow, B-C</td>
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<td>13.3</td>
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<td>Total</td>
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Subcatchment E3: SE Property

Hydrograph

Type III 24-hr 2-yr Rainfall=3.40"
Runoff Area=82,214 sf
Runoff Volume=0.006 af
Runoff Depth=0.04"
Flow Length=290'
Tc=13.3 min
CN=43
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 16.670 ac, 0.00% Impervious, Inflow Depth = 0.09" for 2-yr event
Inflow = 0.22 cfs @ 13.77 hrs, Volume = 0.129 af
Outflow = 0.22 cfs @ 13.77 hrs, Volume = 0.129 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs

Reach DP-1: Wetland

Inflow Area = 16.670 ac
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.887 ac, 0.94% Impervious, Inflow Depth = 0.04" for 2-yr event
Inflow = 0.01 cfs @ 15.62 hrs, Volume= 0.006 af
Outflow = 0.01 cfs @ 15.62 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: SW Property
Runoff Area=190,029 sf  0.00% Impervious  Runoff Depth=0.07"
Flow Length=406’  Tc=12.0 min  CN=36  Runoff=0.04 cfs  0.025 af

Subcatchment E2: Central Property
Runoff Area=536,132 sf  0.00% Impervious  Runoff Depth=0.48"
Flow Length=808’  Tc=17.9 min  CN=48  Runoff=2.57 cfs  0.492 af

Subcatchment E3: SE Property
Runoff Area=82,214 sf  0.94% Impervious  Runoff Depth=0.27"
Flow Length=290’  Tc=13.3 min  CN=43  Runoff=0.15 cfs  0.043 af

Reach DP-1: Wetland
Inflow=2.57 cfs  0.518 af
Outflow=2.57 cfs  0.518 af

Reach DP-2: Water St
Inflow=0.15 cfs  0.043 af
Outflow=0.15 cfs  0.043 af

Total Runoff Area = 18.558 ac  Runoff Volume = 0.561 af  Average Runoff Depth = 0.36"
99.90% Pervious = 18.540 ac  0.10% Impervious = 0.018 ac
Summary for Subcatchment E1: SW Property

Runoff = 0.04 cfs @ 15.37 hrs, Volume= 0.025 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

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Subcatchment E1: SW Property

Type III 24-hr 10-yr Rainfall=4.70"
Runoff Area=190,029 sf
Runoff Volume=0.025 af
Runoff Depth=0.07"
Flow Length=406'
Tc=12.0 min
CN=36
Summary for Subcatchment E2: Central Property

Runoff = 2.57 cfs @ 12.46 hrs, Volume= 0.492 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

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<td>Unpaved ( K_v=16.1 ) fps</td>
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17.9 808 Total

Subcatchment E2: Central Property

Hydrograph

Type III 24-hr
10-yr Rainfall=4.70"
Runoff Area=536,132 sf
Runoff Volume=0.492 af
Runoff Depth=0.48"
Flow Length=808'
Tc=17.9 min
CN=48
Summary for Subcatchment E3: SE Property

Runoff = 0.15 cfs @ 12.51 hrs, Volume= 0.043 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

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<td>Woods: Light underbrush n= 0.400</td>
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<td>240</td>
<td>0.0200</td>
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<td></td>
<td>Shallow Concentrated Flow, B-C</td>
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<td>Unpaved     Kv= 16.1 fps</td>
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<td>13.3</td>
<td>290</td>
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<td>Total</td>
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Subcatchment E3: SE Property

Hydrograph

Type III 24-hr 10-yr Rainfall=4.70"
Runoff Area=82,214 sf
Runoff Volume=0.043 af
Runoff Depth=0.27"
Flow Length=290'
Tc=13.3 min
CN=43
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 16.670 ac, 0.00% Impervious, Inflow Depth = 0.37" for 10-yr event
Inflow    = 2.57 cfs @ 12.46 hrs, Volume= 0.518 af
Outflow   = 2.57 cfs @ 12.46 hrs, Volume= 0.518 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Wetland

Inflow Area=16.670 ac

Hydrograph
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.887 ac, 0.94% Impervious, Inflow Depth = 0.27" for 10-yr event
Inflow = 0.15 cfs @ 12.51 hrs, Volume = 0.043 af
Outflow = 0.15 cfs @ 12.51 hrs, Volume = 0.043 af, Attenu = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs
Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: SW Property
Runoff Area=190,029 sf  0.00% Impervious  Runoff Depth=0.21"
Flow Length=406’  Tc=12.0 min  CN=36  Runoff=0.13 cfs  0.077 af

Subcatchment E2: Central Property
Runoff Area=536,132 sf  0.00% Impervious  Runoff Depth=0.83"
Flow Length=808’  Tc=17.9 min  CN=48  Runoff=5.65 cfs  0.847 af

Subcatchment E3: SE Property
Runoff Area=82,214 sf  0.94% Impervious  Runoff Depth=0.54"
Flow Length=290’  Tc=13.3 min  CN=43  Runoff=0.45 cfs  0.084 af

Reach DP-1: Wetland
Inflow=5.67 cfs  0.924 af
Outflow=5.67 cfs  0.924 af

Reach DP-2: Water St
Inflow=0.45 cfs  0.084 af
Outflow=0.45 cfs  0.084 af

Total Runoff Area = 18.558 ac  Runoff Volume = 1.009 af  Average Runoff Depth = 0.65"
99.90% Pervious = 18.540 ac  0.10% Impervious = 0.018 ac
Summary for Subcatchment E1: SW Property

Runoff = 0.13 cfs @ 12.61 hrs, Volume= 0.077 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.60"

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<tr>
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<td>0.08</td>
<td></td>
<td>Sheet Flow, START off property</td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td>Woods: Light underbrush  n= 0.400  P2= 3.40&quot;</td>
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<tr>
<td>1.8</td>
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<td>Shallow Concentrated Flow, To Wetland Unpaved</td>
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<td>Kv= 16.1 fps</td>
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</table>

12.0     | 406           | Total

Subcatchment E1: SW Property

Type III 24-hr 25-yr Rainfall=5.60"
Runoff Area=190,029 sf
Runoff Volume=0.077 af
Runoff Depth=0.21"
Flow Length=406'
Tc=12.0 min
CN=36
Summary for Subcatchment E2: Central Property

Runoff = 5.65 cfs @ 12.35 hrs, Volume= 0.847 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.60"

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<td>B-C</td>
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17.9 808 Total

Subcatchment E2: Central Property

Type III 24-hr 25-yr Rainfall=5.60"
Runoff Area=536,132 sf
Runoff Volume=0.847 af
Runoff Depth=0.83"
Flow Length=808'
Tc=17.9 min
CN=48
Summary for Subcatchment E3: SE Property

Runoff = 0.45 cfs @ 12.40 hrs, Volume= 0.084 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.60"

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<td>Unpaved Kv= 16.1 fps</td>
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Subcatchment E3: SE Property

Hydrograph

Type III 24-hr 25-yr Rainfall=5.60"
Runoff Area=82,214 sf
Runoff Volume=0.084 af
Runoff Depth=0.54"
Flow Length=290'
Tc=13.3 min
CN=43
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 16.670 ac, 0.00% Impervious, Inflow Depth = 0.67" for 25-yr event
Inflow = 5.67 cfs @ 12.36 hrs, Volume= 0.924 af
Outflow = 5.67 cfs @ 12.36 hrs, Volume= 0.924 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.887 ac, 0.94% Impervious, Inflow Depth = 0.54" for 25-yr event
Inflow = 0.45 cfs @ 12.40 hrs, Volume= 0.084 af
Outflow = 0.45 cfs @ 12.40 hrs, Volume= 0.084 af, Attenuation= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-2: Water St

Hydrograph

Inflow Area=1.887 ac
Type III 24-hr 100-yr Rainfall=7.00"

215-181 PRE-DEV

Prepared by McKenzie Engineering Group, Inc.

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Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: SW Property
Runoff Area=190,029 sf  0.00% Impervious  Runoff Depth=0.56"
Flow Length=406’  Tc=12.0 min  CN=36  Runoff=0.96 cfs  0.203 af

Subcatchment E2: Central Property
Runoff Area=536,132 sf  0.00% Impervious  Runoff Depth=1.49"
Flow Length=808’  Tc=17.9 min  CN=48  Runoff=12.46 cfs  1.529 af

Subcatchment E3: SE Property
Runoff Area=82,214 sf  0.94% Impervious  Runoff Depth=1.07"
Flow Length=290’  Tc=13.3 min  CN=43  Runoff=1.27 cfs  0.169 af

Reach DP-1: Wetland
Inflow=13.28 cfs  1.733 af
Outflow=13.28 cfs  1.733 af

Reach DP-2: Water St
Inflow=1.27 cfs  0.169 af
Outflow=1.27 cfs  0.169 af

Total Runoff Area = 18.558 ac  Runoff Volume = 1.902 af  Average Runoff Depth = 1.23"
99.90% Pervious = 18.540 ac  0.10% Impervious = 0.018 ac
Summary for Subcatchment E1: SW Property

Runoff = 0.96 cfs @ 12.42 hrs, Volume= 0.203 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.00"

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<th>Area (sf)</th>
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<th>Description</th>
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<td>Pervious Area</td>
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<th>Velocity (ft/sec)</th>
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<td>0.08</td>
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<td>Sheet Flow, START off property</td>
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<tr>
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<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
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12.0 406 Total

Subcatchment E1: SW Property

Hydrograph

Type III 24-hr
100-yr Rainfall=7.00"
Runoff Area=190,029 sf
Runoff Volume=0.203 af
Runoff Depth=0.56"
Flow Length=406'
Tc=12.0 min
CN=36
Type III 24-hr  100-yr Rainfall=7.00"

Summary for Subcatchment E2: Central Property

Runoff = 12.46 cfs @ 12.30 hrs, Volume= 1.529 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr  100-yr Rainfall=7.00"

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17.9 808 Total

Subcatchment E2: Central Property

Hydrograph

Type III 24-hr
100-yr Rainfall=7.00"
Runoff Area=536,132 sf
Runoff Volume=1.529 af
Runoff Depth=1.49"
Flow Length=808'
Tc=17.9 min
CN=48
Summary for Subcatchment E3: SE Property

Runoff = 1.27 cfs @ 12.25 hrs, Volume= 0.169 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.00"

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<td>Woods, Good, HSG C</td>
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<td>11,750</td>
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<td>50-75% Grass cover, Fair, HSG A</td>
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<td>770</td>
<td>98</td>
<td>Paved parking, HSG A</td>
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<td>82,214</td>
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<td>770</td>
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<th>Capacity (cfs)</th>
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<td>Woods: Light underbrush  n= 0.400  P2= 3.40&quot;</td>
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13.3 290 Total

Subcatchment E3: SE Property

Type III 24-hr 100-yr Rainfall=7.00"
Runoff Area=82,214 sf
Runoff Volume=0.169 af
Runoff Depth=1.07"
Flow Length=290'
Tc=13.3 min
CN=43
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 16.670 ac, 0.00% Impervious, Inflow Depth = 1.25" for 100-yr event
Inflow = 13.28 cfs @ 12.30 hrs, Volume = 1.733 af
Outflow = 13.28 cfs @ 12.30 hrs, Volume = 1.733 af, Atten = 0%, Lag = 0.0 min

Routing by Stor-Ind+Trans method, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.887 ac, 0.94% Impervious, Inflow Depth = 1.07” for 100-yr event
Inflow = 1.27 cfs @ 12.25 hrs, Volume= 0.169 af
Outflow = 1.27 cfs @ 12.25 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-2: Water St

Hydrograph

Inflow Area=1.887 ac
## Area Listing (all nodes)

<table>
<thead>
<tr>
<th>Area (acres)</th>
<th>CN</th>
<th>Description</th>
<th>(subcatchment-numbers)</th>
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<tbody>
<tr>
<td>5.874</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A (P1, P2, P2a, P3)</td>
<td>(P1, P2, P2a, P3)</td>
</tr>
<tr>
<td>0.145</td>
<td>76</td>
<td>Gravel roads, HSG A (P1, P2)</td>
<td>(P1, P2)</td>
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<td>2.372</td>
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<td>Paved parking, HSG A (P2a)</td>
<td>(P2a)</td>
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<tr>
<td>2.354</td>
<td>98</td>
<td>Roofs, HSG A (P2a)</td>
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<tr>
<td>3.468</td>
<td>36</td>
<td>Woods, Fair, HSG A (P1)</td>
<td>(P1)</td>
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<tr>
<td>4.345</td>
<td>30</td>
<td>Woods, Good, HSG A (P2, P3)</td>
<td>(P2, P3)</td>
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<tr>
<td><strong>18.558</strong></td>
<td><strong>52</strong></td>
<td><strong>TOTAL AREA</strong></td>
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</table>
## Soil Listing (all nodes)

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<td>P1, P2, P2a, P3</td>
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<tr>
<td>0.000</td>
<td>HSG B</td>
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<tr>
<td>0.000</td>
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<tr>
<td>0.000</td>
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<td><strong>TOTAL AREA</strong></td>
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## Ground Covers (all nodes)

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<th>HSG-C (acres)</th>
<th>HSG-D (acres)</th>
<th>Other (acres)</th>
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<th>Ground Cover</th>
<th>Subcatchment Numbers</th>
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<td>0.000</td>
<td>0.000</td>
<td>0.145</td>
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<td>0.000</td>
<td>0.000</td>
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<td>2.372</td>
<td>Paved parking</td>
<td>P2a</td>
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<td>2.354</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>2.354</td>
<td>Roofs</td>
<td>P2a</td>
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<tr>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>TOTAL AREA</td>
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<td>Out-Invert (feet)</td>
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<td>0.013</td>
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215-181 Post-DEV
Type III 24-hr 2-yr Rainfall=3.40"

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: SW Property
Runoff Area=190,029 sf  0.00% Impervious  Runoff Depth=0.00"
Flow Length=400’  Tc=12.0 min  CN=38  Runoff=0.00 cfs  0.000 af

Subcatchment P2: Central Overland
Runoff Area=255,881 sf  0.00% Impervious  Runoff Depth=0.00"
Flow Length=190’  Tc=17.0 min  CN=33  Runoff=0.00 cfs  0.000 af

Subcatchment P2a: Developed Site
Runoff Area=347,600 sf  59.22% Impervious  Runoff Depth=1.17"
Tc=0.0 min  CN=74  Runoff=12.10 cfs  0.779 af

Subcatchment P3: SE Property
Runoff Area=14,865 sf  0.00% Impervious  Runoff Depth=0.00"
Flow Length=290’  Tc=13.3 min  CN=35  Runoff=0.00 cfs  0.000 af

Reach DP-1: Wetland
Inflow=0.00 cfs  0.000 af
Outflow=0.00 cfs  0.000 af

Reach DP-2: Water St
Inflow=0.00 cfs  0.000 af
Outflow=0.00 cfs  0.000 af

Pond 1P: Infiltration Pond
Peak Elev=10.65’ Storage=15,616 cf  Inflow=12.10 cfs  0.779 af
Discarded=0.71 cfs  0.779 af  Primary=0.00 cfs  0.000 af  Outflow=0.71 cfs  0.779 af

Total Runoff Area = 18.558 ac  Runoff Volume = 0.779 af  Average Runoff Depth = 0.50"
74.54% Pervious = 13.832 ac  25.46% Impervious = 4.725 ac
Summary for Subcatchment P1: SW Property

Runoff = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.40"

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<th>Area (sf)</th>
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<td>&gt;75% Grass cover, Good, HSG A</td>
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<td>5,100</td>
<td>76</td>
<td>Gravel roads, HSG A</td>
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<tr>
<td>190,029</td>
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<td>Weighted Average</td>
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<tr>
<td>190,029</td>
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<td>Pervious Area</td>
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<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<tr>
<td>10.2</td>
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<td>0.08</td>
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<td>Sheet Flow, START off property</td>
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<td>Woods: Light underbrush n = 0.400</td>
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<td>P2 = 3.40&quot;</td>
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12.0 400 Total

Subcatchment P1: SW Property

Type III 24-hr 2-yr Rainfall=3.40"
Runoff Area=190,029 sf
Runoff Volume=0.000 af
Runoff Depth=0.00"
Flow Length=400'
Tc=12.0 min
CN=38
Summary for Subcatchment P2: Central Overland

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.40"

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<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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<tr>
<td>71,317</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
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<tr>
<td>1,225</td>
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<tr>
<td>255,881</td>
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<td>Sheet Flow, A-B</td>
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<td>Woods: Light underbrush</td>
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<td>Unpaved Kv= 16.1 fps</td>
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17.0 190 Total

Subcatchment P2: Central Overland

Hydrograph

Type III 24-hr 2-yr Rainfall=3.40"
Runoff Area=255,881 sf
Runoff Volume=0.000 af
Runoff Depth=0.00"
Flow Length=190'
Tc=17.0 min
CN=33
Summary for Subcatchment P2a: Developed Site

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 12.10 cfs @ 12.01 hrs, Volume= 0.779 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.40"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>141,768</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>103,305</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>102,527</td>
<td>98</td>
<td>Roofs, HSG A</td>
</tr>
<tr>
<td>347,600</td>
<td>74</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>141,768</td>
<td>40.78% Pervious Area</td>
<td></td>
</tr>
<tr>
<td>205,832</td>
<td>59.22% Impervious Area</td>
<td></td>
</tr>
</tbody>
</table>

Subcatchment P2a: Developed Site

Hydrograph

Type III 24-hr 2-yr Rainfall=3.40"
Runoff Area=347,600 sf
Runoff Volume=0.779 af
Runoff Depth=1.17"
Tc=0.0 min
CN=74
Summary for Subcatchment P3: SE Property

Hint: Runoff=Zero

Runoff  =  0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-yr Rainfall=3.40"

<table>
<thead>
<tr>
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<td>5,946</td>
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<td>Woods, Good, HSG A</td>
</tr>
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<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>14,865</td>
<td>35</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,865</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5</td>
<td>50</td>
<td>0.0220</td>
<td>0.07</td>
<td></td>
<td>Sheet Flow, A-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
</tr>
<tr>
<td>1.8</td>
<td>240</td>
<td>0.0200</td>
<td>2.28</td>
<td></td>
<td>Shallow Concentrated Flow, B-C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
<tr>
<td>13.3</td>
<td>290</td>
<td></td>
<td></td>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Subcatchment P3: SE Property

Hydrograph

Type III 24-hr 2-yr Rainfall=3.40"
Runoff Area=14,865 sf
Runoff Volume=0.000 af
Runoff Depth=0.00"
Flow Length=290'
Tc=13.3 min
CN=35
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.216 ac, 25.94% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.341 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Attten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Summary for Pond 1P: Infiltration Pond

Inflow Area = 7.980 ac, 59.22% Impervious, Inflow Depth = 1.17" for 2-yr event
Inflow  = 12.10 cfs @ 12.01 hrs, Volume= 0.779 af
Outflow = 0.71 cfs @ 11.85 hrs, Volume= 0.779 af, Atten= 94%, Lag= 0.0 min
Discarded = 0.71 cfs @ 11.85 hrs, Volume= 0.779 af
Primary  = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 10.65' @ 14.57 hrs  Surf.Area= 14,460 sf   Storage= 15,616 cf
Plug-Flow detention time= 233.3 min calculated for 0.778 af (100% of inflow)
Center-of-Mass det. time= 233.3 min ( 1,086.0 - 852.8 )

Volume | Invert | Avail.Storage | Storage Description
--- | --- | --- | ---
#1 | 9.50' | 75,823 cf | Custom Stage Data (Prismatic)\(\text{Listed below (Recalc)}\)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9.50</td>
<td>12,792</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10.00</td>
<td>13,508</td>
<td>6,575</td>
<td>6,575</td>
</tr>
<tr>
<td>11.00</td>
<td>14,981</td>
<td>14,245</td>
<td>20,820</td>
</tr>
<tr>
<td>12.00</td>
<td>19,481</td>
<td>17,231</td>
<td>38,051</td>
</tr>
<tr>
<td>13.00</td>
<td>21,280</td>
<td>20,381</td>
<td>58,431</td>
</tr>
<tr>
<td>13.80</td>
<td>22,200</td>
<td>17,392</td>
<td>75,823</td>
</tr>
</tbody>
</table>

Device | Routing | Invert | Outlet Devices
---|---|---|---
#1 | Primary | 10.80' | 2.0' long x 2.00' rise Sharp-Crested Rectangular Weir
| | | | 2 End Contraction(s)
#2 | Device 1 | 9.75' | 12.0" Round Culvert
| | | | L= 46.0" CPP, projecting, no headwall, Ke= 0.900
| | | | Inlet / Outlet Invert= 9.75'/ 9.29' S= 0.0100 '/' Cc= 0.900
| | | | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3 | Discarded | 9.50' | Special & User-Defined
| | | | Head (feet) 0.00 0.10 1.00 1.50 1.69 1.70 4.00
| | | | Disch. (cfs) 0.000 0.714 0.714 0.714 0.714 0.000 0.000

Discarded OutFlow \(\text{Max=0.71 cfs @ 11.85 hrs HW=9.65'}\) (Free Discharge)

Primary OutFlow \(\text{Max=0.00 cfs @ 0.00 hrs HW=9.50'}\) (Free Discharge)

\(\uparrow1\)=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)
\(\downarrow2\)=Culvert (Controls 0.00 cfs)
Pond 1P: Infiltration Pond

Inflow Area=7.980 ac
Peak Elev=10.65'
Storage=15,616 cf
Type III 24-hr 10-yr Rainfall=4.70"

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: SW Property
Runoff Area=190,029 sf  0.00% Impervious  Runoff Depth=0.12"
Flow Length=400’  Tc=12.0 min  CN=38  Runoff=0.07 cfs  0.042 af

Subcatchment P2: Central Overland
Runoff Area=255,881 sf  0.00% Impervious  Runoff Depth=0.02"
Flow Length=190’  Tc=17.0 min  CN=33  Runoff=0.02 cfs  0.010 af

Subcatchment P2a: Developed Site
Runoff Area=347,600 sf  59.22% Impervious  Runoff Depth=2.13"
Tc=0.0 min  CN=74  Runoff=22.72 cfs  1.415 af

Subcatchment P3: SE Property
Runoff Area=14,865 sf  0.00% Impervious  Runoff Depth=0.05"
Flow Length=290’  Tc=13.3 min  CN=35  Runoff=0.00 cfs  0.001 af

Reach DP-1: Wetland
Inflow=1.62 cfs  0.449 af
Outflow=1.62 cfs  0.449 af

Reach DP-2: Water St
Inflow=0.00 cfs  0.001 af
Outflow=0.00 cfs  0.001 af

Pond 1P: Infiltration Pond
Peak Elev=11.36’  Storage=26,505 cf
Inflow=22.72 cfs  1.415 af
Discarded=0.71 cfs  1.018 af
Primary=1.52 cfs  0.397 af
Outflow=2.23 cfs  1.415 af

Total Runoff Area = 18.558 ac  Runoff Volume = 1.468 af  Average Runoff Depth = 0.95"
74.54% Pervious = 13.832 ac  25.46% Impervious = 4.725 ac
Summary for Subcatchment P1: SW Property

Runoff = 0.07 cfs @ 14.79 hrs, Volume = 0.042 af, Depth = 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs
Type III 24-hr 10-yr Rainfall = 4.70"

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<tr>
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<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
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<tr>
<td>5,100</td>
<td>76</td>
<td>Gravel roads, HSG A</td>
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<tr>
<td>190,029</td>
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<table>
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<tr>
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<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<td>0.08</td>
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<tr>
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<td></td>
<td></td>
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<td>Woods: Light underbrush n = 0.400 P2 = 3.40&quot;</td>
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<tr>
<td>1.8</td>
<td>350</td>
<td>0.0410</td>
<td>3.26</td>
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<td>Shallow Concentrated Flow, To Wetland</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv = 16.1 fps</td>
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<tr>
<td>12.0</td>
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<td></td>
<td>Total</td>
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Subcatchment P1: SW Property

Hydrograph

Type III 24-hr 10-yr Rainfall = 4.70"
Runoff Area = 190,029 sf
Runoff Volume = 0.042 af
Runoff Depth = 0.12"
Flow Length = 400'
Tc = 12.0 min
CN = 38
Summary for Subcatchment P2: Central Overland

Runoff = 0.02 cfs @ 21.65 hrs, Volume= 0.010 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

<table>
<thead>
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<th>Area (sf)</th>
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<th>Description</th>
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<tbody>
<tr>
<td>183,339</td>
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<td>71,317</td>
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<tr>
<td>1,225</td>
<td>76</td>
<td>Gravel roads, HSG A</td>
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<tr>
<td>255,881</td>
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<td>Weighted Average</td>
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<tr>
<td>255,881</td>
<td>100.00%</td>
<td>Pervious Area</td>
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</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
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<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>15.8</td>
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<td>0.05</td>
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<td>Sheet Flow, A-B</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>n= 0.400</td>
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<tr>
<td>1.2</td>
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<td>Unpaved</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

Subcatchment P2: Central Overland

Type III 24-hr 10-yr Rainfall=4.70"
Runoff Area=255,881 sf
Runoff Volume=0.010 af
Runoff Depth=0.02"
Flow Length=190'
Tc=17.0 min
CN=33
Summary for Subcatchment P2a: Developed Site

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 22.72 cfs @ 12.01 hrs, Volume= 1.415 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.70"

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<td>40.78%</td>
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<td>205,832</td>
<td>59.22%</td>
<td>Impervious Area</td>
</tr>
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</table>

Subcatchment P2a: Developed Site

Type III 24-hr 10-yr Rainfall=4.70"
Runoff Area=347,600 sf
Runoff Volume=1.415 af
Runoff Depth=2.13"
Tc=0.0 min
CN=74
Summary for Subcatchment P3: SE Property

Runoff = 0.00 cfs @ 15.75 hrs, Volume = 0.001 af, Depth = 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs
Type III 24-hr 10-yr Rainfall = 4.70"

<table>
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<td>14,865</td>
<td>35</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,865</td>
<td>100.00% Pervious Area</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
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<td>0.07</td>
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<td>Sheet Flow, A-B</td>
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<td></td>
<td></td>
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<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 3.40&quot;</td>
</tr>
<tr>
<td>1.8</td>
<td>240</td>
<td>0.0200</td>
<td>2.28</td>
<td></td>
<td>Shallow Concentrated Flow, B-C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv = 16.1 fps</td>
</tr>
</tbody>
</table>

13.3 290 Total

Subcatchment P3: SE Property

Type III 24-hr 10-yr Rainfall = 4.70"
Runoff Area = 14,865 sf
Runoff Volume = 0.001 af
Runoff Depth = 0.05"
Flow Length = 290'
Tc = 13.3 min
CN = 35
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.216 ac, 25.94% Impervious, Inflow Depth = 0.30" for 10-yr event
Inflow  = 1.62 cfs @ 14.57 hrs, Volume= 0.449 af
Outflow = 1.62 cfs @ 14.57 hrs, Volume= 0.449 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.341 ac, 0.00% Impervious, Inflow Depth = 0.05" for 10-yr event
Inflow = 0.00 cfs @ 15.75 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 15.75 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-2: Water St

Hydrograph

Inflow Area=0.341 ac
Summary for Pond 1P: Infiltration Pond

Inflow Area = 7.980 ac, 59.22% Impervious, Inflow Depth = 2.13" for 10-yr event
Inflow = 22.72 cfs @ 12.01 hrs, Volume= 1.415 af
Outflow = 2.23 cfs @ 12.86 hrs, Volume= 1.415 af, Atten= 90%, Lag= 51.2 min
Discarded = 0.71 cfs @ 11.60 hrs, Volume= 1.018 af
Primary = 1.52 cfs @ 12.86 hrs, Volume= 0.397 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 11.36' @ 12.86 hrs Surf.Area= 16,601 sf Storage= 26,505 cf
Plug-Flow detention time= 238.0 min calculated for 1.414 af (100% of inflow)
Center-of-Mass det. time= 238.1 min (1,073.0 - 835.0)

<table>
<thead>
<tr>
<th>Volume</th>
<th>Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>9.50'</td>
<td>75,823 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9.50</td>
<td>12,792</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10.00</td>
<td>13,508</td>
<td>6,575</td>
<td>6,575</td>
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<tr>
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<tr>
<td>13.80</td>
<td>22,200</td>
<td>17,392</td>
<td>75,823</td>
</tr>
</tbody>
</table>

Device | Routing | Invert | Outlet Devices |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Primary</td>
<td>10.80'</td>
<td>2.0' long x 2.00' rise Sharp-Crested Rectangular Weir</td>
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<tr>
<td>#2</td>
<td>Device 1</td>
<td>9.75'</td>
<td>12.0&quot; Round Culvert</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L= 46.0&quot;  CPP, projecting, no headwall, Ke= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Inlet / Outlet Invert= 9.75' / 9.29'  S= 0.0100 '/'  Cc= 0.900</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n= 0.013  Corrugated PE, smooth interior, Flow Area= 0.79 sf</td>
</tr>
<tr>
<td>#3</td>
<td>Discarded</td>
<td>9.50'</td>
<td>Special &amp; User-Defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Head (feet) 0.00 0.10 1.00 1.50 1.69 1.70 4.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Disch. (cfs) 0.000 0.714 0.714 0.714 0.714 0.714 0.000 0.000</td>
</tr>
</tbody>
</table>

Discarded OutFlow Max= 0.71 cfs @ 11.60 hrs HW= 9.65' (Free Discharge)
Primary OutFlow Max= 2.23 cfs @ 12.86 hrs HW= 11.36' (Free Discharge)
1= Special & User-Defined (Custom Controls 0.71 cfs)
2=Culvert (Inlet Controls 2.23 cfs @ 2.84 fps)
Pond 1P: Infiltration Pond

Inflow Area=7.980 ac
Peak Elev=11.36'
Storage=26,505 cf
**215-181 Post-DEV**

Type III 24-hr 25-yr Rainfall=5.60"

Prepared by McKenzie Engineering Group, Inc.

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

### Subcatchment P1: SW Property
- Runoff Area=190,029 sf 0.00% Impervious  Runoff Depth=0.29"
- Flow Length=400’  Tc=12.0 min  CN=38  Runoff=0.33 cfs 0.106 af

### Subcatchment P2: Central Overland
- Runoff Area=255,881 sf 0.00% Impervious  Runoff Depth=0.11"
- Flow Length=190’  Tc=17.0 min  CN=33  Runoff=0.08 cfs 0.053 af

### Subcatchment P2a: Developed Site
- Runoff Area=347,600 sf 59.22% Impervious  Runoff Depth=2.85"
  Tc=0.0 min  CN=74  Runoff=30.64 cfs 1.896 af

### Subcatchment P3: SE Property
- Runoff Area=14,865 sf 0.00% Impervious  Runoff Depth=0.17"
- Flow Length=290’  Tc=13.3 min  CN=35  Runoff=0.01 cfs 0.005 af

### Reach DP-1: Wetland

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.42 cfs</td>
<td>3.42 cfs</td>
</tr>
</tbody>
</table>

### Reach DP-2: Water St

<table>
<thead>
<tr>
<th>Inflow</th>
<th>Outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 cfs</td>
<td>0.01 cfs</td>
</tr>
</tbody>
</table>

### Pond 1P: Infiltration Pond

| Peak Elev=11.89’ | Storage=35,905 cf | Inflow=30.64 cfs 1.896 af |
| Discarded=0.71 cfs 0.921 af | Primary=3.11 cfs 0.976 af | Outflow=3.11 cfs 1.896 af |

**Total Runoff Area = 18.558 ac**  **Runoff Volume = 2.061 af**  **Average Runoff Depth = 1.33"**

74.54% Pervious = 13.832 ac  25.46% Impervious = 4.725 ac
Summary for Subcatchment P1: SW Property

Runoff = 0.33 cfs @ 12.51 hrs, Volume = 0.106 af, Depth = 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs
Type III 24-hr 25-yr Rainfall = 5.60"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>151,064</td>
<td>36</td>
<td>Woods, Fair, HSG A</td>
</tr>
<tr>
<td>33,865</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>5,100</td>
<td>76</td>
<td>Gravel roads, HSG A</td>
</tr>
<tr>
<td>190,029</td>
<td>38</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>190,029</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2</td>
<td>50</td>
<td>0.0300</td>
<td>0.08</td>
<td></td>
<td><strong>Sheet Flow, START off property</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 3.40&quot;</td>
</tr>
<tr>
<td>1.8</td>
<td>350</td>
<td>0.0410</td>
<td>3.26</td>
<td></td>
<td><strong>Shallow Concentrated Flow, To Wetland</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv = 16.1 fps</td>
</tr>
</tbody>
</table>

12.0 400 Total

Subcatchment P1: SW Property

Type III 24-hr 25-yr Rainfall = 5.60"
Runoff Area = 190,029 sf
Runoff Volume = 0.106 af
Runoff Depth = 0.29"
Flow Length = 400'
Tc = 12.0 min
CN = 38
Summary for Subcatchment P2: Central Overland

Runoff = 0.08 cfs @ 15.15 hrs, Volume= 0.053 af, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.60"

<table>
<thead>
<tr>
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</tr>
<tr>
<td>71,317</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>1,225</td>
<td>76</td>
<td>Gravel roads, HSG A</td>
</tr>
<tr>
<td>255,881</td>
<td>33</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>255,881</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.8</td>
<td>50</td>
<td>0.0100</td>
<td>0.05</td>
<td></td>
<td>Sheet Flow, A-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush    n= 0.400  P2= 3.40&quot;</td>
</tr>
<tr>
<td>1.2</td>
<td>140</td>
<td>0.0150</td>
<td>1.97</td>
<td></td>
<td>Shallow Concentrated Flow, B-C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

17.0 190 Total

Subcatchment P2: Central Overland

Type III 24-hr 25-yr Rainfall=5.60"
Runoff Area=255,881 sf
Runoff Volume=0.053 af
Runoff Depth=0.11"
Flow Length=190'
Tc=17.0 min
CN=33
Summary for Subcatchment P2a: Developed Site

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 30.64 cfs @ 12.00 hrs, Volume= 1.896 af, Depth= 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr  25-yr Rainfall=5.60"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>141,768</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>103,305</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>102,527</td>
<td>98</td>
<td>Roofs, HSG A</td>
</tr>
<tr>
<td>347,600</td>
<td>74</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>141,768</td>
<td></td>
<td>40.78% Pervious Area</td>
</tr>
<tr>
<td>205,832</td>
<td></td>
<td>59.22% Impervious Area</td>
</tr>
</tbody>
</table>

Subcatchment P2a: Developed Site

Hydrograph

Type III 24-hr  25-yr Rainfall=5.60"
Runoff Area=347,600 sf
Runoff Volume=1.896 af
Runoff Depth=2.85"
Tc=0.0 min  
CN=74
Summary for Subcatchment P3: SE Property

Runoff = 0.01 cfs @ 13.86 hrs, Volume= 0.005 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.60"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5,946</td>
<td>30</td>
<td>Woods, Good, HSG A</td>
</tr>
<tr>
<td>8,919</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>14,865</td>
<td>35</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,865</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5</td>
<td>50</td>
<td>0.0220</td>
<td>0.07</td>
<td></td>
<td>Sheet Flow, A-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
</tr>
<tr>
<td>1.8</td>
<td>240</td>
<td>0.0200</td>
<td>2.28</td>
<td></td>
<td>Shallow Concentrated Flow, B-C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

Subcatchment P3: SE Property

Type III 24-hr 25-yr Rainfall=5.60"
Runoff Area=14,865 sf
Runoff Volume=0.005 af
Runoff Depth=0.17"
Flow Length=290'
Tc=13.3 min
CN=35
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.216 ac, 25.94% Impervious, Inflow Depth = 0.75" for 25-yr event
Inflow = 3.42 cfs @ 12.53 hrs, Volume= 1.135 af
Outflow = 3.42 cfs @ 12.53 hrs, Volume= 1.135 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.341 ac, 0.00% Impervious, Inflow Depth = 0.17" for 25-yr event
Inflow = 0.01 cfs @ 13.86 hrs, Volume = 0.005 af
Outflow = 0.01 cfs @ 13.86 hrs, Volume = 0.005 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Summary for Pond 1P: Infiltration Pond

Inflow Area = 7.980 ac, 59.22% Impervious, Inflow Depth = 2.85" for 25-yr event
Inflow = 30.64 cfs @ 12.00 hrs, Volume= 1.896 af
Outflow = 3.11 cfs @ 12.78 hrs, Volume= 1.896 af, Atten= 90%, Lag= 46.5 min
Discarded = 0.71 cfs @ 11.25 hrs, Volume= 0.921 af
Primary = 3.11 cfs @ 12.78 hrs, Volume= 0.976 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 11.89' @ 12.78 hrs  Surf.Area= 18,979 sf  Storage= 35,905 cf
Plug-Flow detention time= 221.7 min calculated for 1.895 af (100% of inflow)
Center-of-Mass det. time= 221.8 min (1,048.3 - 826.4)

<table>
<thead>
<tr>
<th>Volume Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 9.50'</td>
<td>75,823 cf</td>
<td>Custom Stage Data (Prismatic) Listed below (Recalc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Surf.Area</th>
<th>Inc.Store</th>
<th>Cum.Store</th>
</tr>
</thead>
<tbody>
<tr>
<td>(feet)</td>
<td>(sq-ft)</td>
<td>(cubic-feet)</td>
<td>(cubic-feet)</td>
</tr>
<tr>
<td>9.50</td>
<td>12,792</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10.00</td>
<td>13,508</td>
<td>6,575</td>
<td>6,575</td>
</tr>
<tr>
<td>11.00</td>
<td>14,981</td>
<td>14,245</td>
<td>20,820</td>
</tr>
<tr>
<td>12.00</td>
<td>19,481</td>
<td>17,231</td>
<td>38,051</td>
</tr>
<tr>
<td>13.00</td>
<td>21,280</td>
<td>20,381</td>
<td>58,431</td>
</tr>
<tr>
<td>13.80</td>
<td>22,200</td>
<td>17,392</td>
<td>75,823</td>
</tr>
</tbody>
</table>

Device Routing Invert Outlet Devices
#1 Primary 10.80' 2.0' long x 2.0' rise Sharp-Crested Rectangular Weir
#2 Device 1 9.75' 12.0" Round Culvert
#3 Discarded 9.50' Special & User-Defined

Discarded OutFlow Max=0.71 cfs @ 11.25 hrs HW=9.63' (Free Discharge)
Primary OutFlow Max=3.11 cfs @ 12.78 hrs HW=11.89' (Free Discharge)
Pond 1P: Infiltration Pond

Hydrograph

Inflow Area=7.980 ac
Peak Elev=11.89'
Storage=35,905 cf
Type III 24-hr 100-yr Rainfall=7.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1: SW Property
- Runoff Area=190,029 sf
- 0.00% Impervious
- Runoff Depth=0.70"
- Flow Length=400’
- Tc=12.0 min
- CN=38
- Runoff=1.40 cfs
- 0.253 af

Subcatchment P2: Central Overland
- Runoff Area=255,881 sf
- 0.00% Impervious
- Runoff Depth=0.37"
- Flow Length=190’
- Tc=17.0 min
- CN=33
- Runoff=0.53 cfs
- 0.182 af

Subcatchment P2a: Developed Site
- Runoff Area=347,600 sf
- 59.22% Impervious
- Runoff Depth=4.04"
- Tc=0.0 min
- CN=74
- Runoff=43.44 cfs
- 2.688 af

Subcatchment P3: SE Property
- Runoff Area=14,865 sf
- 0.00% Impervious
- Runoff Depth=0.49"
- Flow Length=290’
- Tc=13.3 min
- CN=35
- Runoff=0.06 cfs
- 0.014 af

Reach DP-1: Wetland
- Inflow=5.89 cfs
- 2.221 af
- Outflow=5.89 cfs
- 2.221 af

Reach DP-2: Water St
- Inflow=0.06 cfs
- 0.014 af
- Outflow=0.06 cfs
- 0.014 af

Pond 1P: Infiltration Pond
- Peak Elev=12.76’
- Storage=53,316 cf
- Inflow=43.44 cfs
- 2.688 af
- Discarded=0.71 cfs
- 0.902 af
- Primary=4.18 cfs
- 1.785 af
- Outflow=4.18 cfs
- 2.688 af

Total Runoff Area = 18.558 ac
Runoff Volume = 3.137 af
Average Runoff Depth = 2.03"
74.54% Pervious = 13.832 ac
25.46% Impervious = 4.725 ac
Summary for Subcatchment P1: SW Property

Runoff = 1.40 cfs @ 12.37 hrs, Volume = 0.253 af, Depth = 0.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-72.00 hrs, dt = 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.00"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
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</thead>
<tbody>
<tr>
<td>151,064</td>
<td>36</td>
<td>Woods, Fair, HSG A</td>
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<tr>
<td>33,865</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>5,100</td>
<td>76</td>
<td>Gravel roads, HSG A</td>
</tr>
<tr>
<td>190,029</td>
<td>38</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>190,029</td>
<td></td>
<td>100.00% Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
<th>Velocity (ft/sec)</th>
<th>Capacity (cfs)</th>
<th>Description</th>
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<tbody>
<tr>
<td>10.2</td>
<td>50</td>
<td>0.0300</td>
<td>0.08</td>
<td></td>
<td>Sheet Flow, START off property</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n = 0.400 P2 = 3.40&quot;</td>
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<tr>
<td>1.8</td>
<td>350</td>
<td>0.0410</td>
<td>3.26</td>
<td></td>
<td>Shallow Concentrated Flow, To Wetland</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv = 16.1 fps</td>
</tr>
</tbody>
</table>

Subcatchment P1: SW Property

Hydrograph

Type III 24-hr 100-yr Rainfall=7.00"
Runoff Area=190,029 sf
Runoff Volume=0.253 af
Runoff Depth=0.70"
Flow Length=400'
Tc=12.0 min
CN=38
Summary for Subcatchment P2: Central Overland

Runoff = 0.53 cfs @ 12.58 hrs, Volume = 0.182 af, Depth = 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall = 7.00"

<table>
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<td>76</td>
<td>Gravel roads, HSG A</td>
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<tr>
<td>255,881</td>
<td>33</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>255,881</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc (min)</th>
<th>Length (feet)</th>
<th>Slope (ft/ft)</th>
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<tr>
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<td>50</td>
<td>0.0100</td>
<td>0.05</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
</tr>
<tr>
<td>1.2</td>
<td>140</td>
<td>0.0150</td>
<td>1.97</td>
<td></td>
<td>Shallow Concentrated Flow, B-C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
</tbody>
</table>

17.0 190 Total

Subcatchment P2: Central Overland

Hydrograph

Type III 24-hr 100-yr Rainfall = 7.00"
Runoff Area = 255,881 sf
Runoff Volume = 0.182 af
Runoff Depth = 0.37"
Flow Length = 190'
Tc = 17.0 min
CN = 33
Summary for Subcatchment P2a: Developed Site

[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 43.44 cfs @ 12.00 hrs, Volume = 2.688 af, Depth = 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span = 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall = 7.00"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>141,768</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>103,305</td>
<td>98</td>
<td>Paved parking, HSG A</td>
</tr>
<tr>
<td>102,527</td>
<td>98</td>
<td>Roofs, HSG A</td>
</tr>
<tr>
<td>347,600</td>
<td>74</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>141,768</td>
<td></td>
<td>40.78% Pervious Area</td>
</tr>
<tr>
<td>205,832</td>
<td></td>
<td>59.22% Impervious Area</td>
</tr>
</tbody>
</table>

Subcatchment P2a: Developed Site

Hydrograph

Type III 24-hr 100-yr Rainfall = 7.00"
Runoff Area = 347,600 sf
Runoff Volume = 2.688 af
Runoff Depth = 4.04"
Tc = 0.0 min
CN = 74
Summary for Subcatchment P3: SE Property

Runoff = 0.06 cfs @ 12.47 hrs, Volume= 0.014 af, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=7.00"

<table>
<thead>
<tr>
<th>Area (sf)</th>
<th>CN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,946</td>
<td>30</td>
<td>Woods, Good, HSG A</td>
</tr>
<tr>
<td>8,919</td>
<td>39</td>
<td>&gt;75% Grass cover, Good, HSG A</td>
</tr>
<tr>
<td>14,865</td>
<td>35</td>
<td>Weighted Average</td>
</tr>
<tr>
<td>14,865</td>
<td>100.00%</td>
<td>Pervious Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc</th>
<th>Length</th>
<th>Slope</th>
<th>Velocity</th>
<th>Capacity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5</td>
<td>50</td>
<td>0.0220</td>
<td>0.07</td>
<td></td>
<td>Sheet Flow, A-B</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Woods: Light underbrush n= 0.400 P2= 3.40&quot;</td>
</tr>
<tr>
<td>1.8</td>
<td>240</td>
<td>0.0200</td>
<td>2.28</td>
<td></td>
<td>Shallow Concentrated Flow, B-C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Unpaved Kv= 16.1 fps</td>
</tr>
<tr>
<td>13.3</td>
<td>290</td>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subcatchment P3: SE Property

Type III 24-hr 100-yr Rainfall=7.00"
Runoff Area=14,865 sf
Runoff Volume=0.014 af
Runoff Depth=0.49"
Flow Length=290'
Tc=13.3 min
CN=35
Summary for Reach DP-1: Wetland

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 18.216 ac, 25.94% Impervious, Inflow Depth = 1.46” for 100-yr event
Inflow = 5.89 cfs @ 12.47 hrs, Volume= 2.221 af
Outflow = 5.89 cfs @ 12.47 hrs, Volume= 2.221 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-1: Wetland

Hydrograph

Inflow Area=18.216 ac
Summary for Reach DP-2: Water St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 0.341 ac, 0.00% Impervious, Inflow Depth = 0.49" for 100-yr event
Inflow = 0.06 cfs @ 12.47 hrs, Volume= 0.014 af
Outflow = 0.06 cfs @ 12.47 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Reach DP-2: Water St

Hydrograph

Inflow Area=0.341 ac
Summary for Pond 1P: Infiltration Pond

Inflow Area = 7.980 ac, 59.22% Impervious, Inflow Depth = 4.04" for 100-yr event
Inflow = 43.44 cfs @ 12.00 hrs, Volume= 2.688 af
Outflow = 4.18 cfs @ 12.79 hrs, Volume= 2.688 af, Atten= 90%, Lag= 47.3 min
Discarded = 0.71 cfs @ 10.60 hrs, Volume= 0.902 af
Primary = 4.18 cfs @ 12.79 hrs, Volume= 1.785 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 12.76' @ 12.79 hrs  Surf.Area= 20,843 sf  Storage= 53,316 cf

Plug-Flow detention time= 215.3 min calculated for 2.686 af (100% of inflow)
Center-of-Mass det. time= 215.5 min (1,031.9 - 816.4)

<table>
<thead>
<tr>
<th>Volume Invert</th>
<th>Avail.Storage</th>
<th>Storage Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 9.50'</td>
<td>75,823 cf</td>
<td>Custom Stage Data (Prismatic)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9.50</td>
<td>12,792</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10.00</td>
<td>13,508</td>
<td>6,575</td>
<td>6,575</td>
</tr>
<tr>
<td>11.00</td>
<td>14,981</td>
<td>14,245</td>
<td>20,820</td>
</tr>
<tr>
<td>12.00</td>
<td>19,481</td>
<td>17,231</td>
<td>38,051</td>
</tr>
<tr>
<td>13.00</td>
<td>21,280</td>
<td>20,381</td>
<td>58,431</td>
</tr>
<tr>
<td>13.80</td>
<td>22,200</td>
<td>17,392</td>
<td>75,823</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Device</th>
<th>Routing</th>
<th>Invert</th>
<th>Outlet Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 Primary</td>
<td>10.80'</td>
<td>2.0' long x 2.00' rise Sharp-Crested Rectangular Weir</td>
<td></td>
</tr>
<tr>
<td>#2 Device 1</td>
<td>9.75'</td>
<td>12.0&quot; Round Culvert</td>
<td></td>
</tr>
<tr>
<td>L= 46.0', CPP, projecting, no headwall</td>
<td>Ke= 0.900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inlet / Outlet Invert= 9.75' / 9.29'</td>
<td>S= 0.0100 '/' Cc= 0.900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n= 0.013</td>
<td>Corrugated PE, smooth interior, Flow Area= 0.79 sf</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#3 Discarded</td>
<td>9.50'</td>
<td>Special &amp; User-Defined</td>
<td></td>
</tr>
<tr>
<td>Head (feet)</td>
<td>0.00 0.10 1.00 1.50 1.69 1.70 4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disch. (cfs)</td>
<td>0.000 0.714 0.714 0.714 0.714 0.714 0.000 0.000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Discarded OutFlow Max=0.71 cfs @ 10.60 hrs  HW=9.63' (Free Discharge)

Primary OutFlow Max=4.18 cfs @ 12.79 hrs  HW=12.76' (Free Discharge)

↓3=Special & User-Defined (Custom Controls 0.71 cfs)

↓1=Sharp-Crested Rectangular Weir (Passes 4.18 cfs of 14.40 cfs potential flow)
↓2=Culvert (Inlet Controls 4.18 cfs @ 5.32 fps)
Pond 1P: Infiltration Pond

Inflow Area=7.980 ac
Peak Elev=12.76'
Storage=53,316 cf