# Stormwater Management Report

Five Paths Tax Map 39, Parcel 15A Wayland, MA

> July 2019 Rev 1 – July 14, 2020



<u>Submitted to:</u> Wayland Planning Board 41 Cochituate Road Wayland, MA 01778

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> > <u>Project No:</u> 171053



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### Attachments

"Residential Subdivision - Definitive Plan - Five Paths Tax Map #39, Parcel 15A" prepared for Ross C. Wilkinson Personal Representative, Estate of Paula D. Wilkinson. Dated July 2019. Last revised July 14, 2020.

Long-Term Pollution Prevention Plan & Stormwater System Operation and Maintenance Plan, Dated July 2019. Last revised July 14, 2020.

## Introduction and Methodology

This drainage narrative is intended to accompany plans for the proposed residential subdivision named Five Paths, located between Shaw Drive and Woodridge Road in Wayland, MA. Drainage has been evaluated to comply with the Massachusetts Stormwater Management Handbook and the Town of Wayland Bylaws. Site specific information has been evaluated under two scenarios, "pre-development" and "post-development" to match the Definitive Subdivision Plan as designed on the accompanying drawings.

Evaluations of these conditions have been done so that potential impacts due to the project can be identified, quantified, and mitigated to the extents practicable. Summary data and calculations are provided herein and on drawing entitled "Drainage Plan" reflecting the hydrologic and hydraulic modeling of the stormwater management system that has been completed for the project.

The final design intent seeks to meet the following interrelated goals:

- 1. Limit stormwater runoff rates for the 0.5", 1.0", 2-, 10-, 25- and 100-year storm events to existing (pre-development) levels;
- 2. Limit post-development peak stormwater runoff volumes for the 2-year, 10-year storm, 25-year, and 100-year storm events to existing (pre-development) levels.
- 3. Evaluate potential on- and off-site flooding during the 100-year storm event due to proposed development;
- 4. Maintain or increase the volume of stormwater recharged per storm event to those of existing (pre-development) levels;
- 5. Prevent appreciable sediment and other suspended solids and contaminants transport by trapping them on site via Best Management Practices;
- 6. Provide adequate drainage for new surfaces;
- 7. Maintain existing drainage patterns while providing a cost-effective engineering solution that addresses regulatory as well as real-world constraints.
- 8. Protect final graded surfaces and outfalls with adequate energy dissipation and erosion control.

### Site Description

This proposed residential subdivision is located off Shaw Drive in southern Wayland. The project site area is a 6.5± acre portion of a 13.7± acre parcel currently identified on Wayland Assessor's Map 39, Parcel 015A. The 7.2± acres of Parcel 39-015A not being developed for subdivision are designated as "Remaining Lands of Wilkinson." None of Parcel 39-15A is currently developed, and

the parcel consists primarily of mixed evergreen and deciduous forest with some large rock outcrops.

The site is located on rolling terrain, rising in elevation  $54\pm$  vertical feet from the lowest point in the northwest corner at Shaw Drive to the highest point at the southern limit of the subdivision. The land has a primary ridge running from southwest to northeast, splitting into two main watersheds draining generally west and south. A topographic saddle point at the southern end of the subject property, along with some bedrock ledge outcrops, creates several smaller sub-watersheds. The land typically slopes at approximately 10% to 16%, with internal undulations creating some leveling areas containing lesser slopes ranging between 3% to 5%.

Available NRCS soils mapping for the project and surrounding areas shows consistent soils, ranging from Hydrologic Soil Group (HSG) A & D. 45% of the soils consists of gravelly Narragansett loamy sand, which has a Hydraulic soil group of A. The remainder of the is a mixture of Hollis rock complex and ledge, both classified as a HSG D. Onsite soil evaluations done during subsurface sewage design were comprised of a gravelly sandy loam and loamy sand base with less than 15% cobble and boulders. These soil classifications, along with other listed characteristics in the logs reveal that the overall mapping is consistent with the field evaluation.

When determining the most appropriate HSG for overall hydrologic analysis, HSG C was selected on the basis that the results be conservative in nature yet provide as realistic a characterization of the hydraulic conductivity of the soils as possible. The NRCS soil map unit data was considered along with the Part 630, Chapter 7 "Hydrologic Soil Groups" of the National Engineering Handbook (NEH). According to this handbook, the range of saturated hydraulic conductivity of the least impermeable layer placed the soil map's conductivity range between HSG B and HSG C. Since the lower end of the Narragansett's conductivity range is less than the lower limit of the HSG B from the NEH, and the fact that there was a noticeable amount of cobbles and boulders, HSG C was selected for analysis.

Test holes dug in stormwater retention and infiltration basins revealed deeper sand and loamy sand deposits that are more consistent the HSG A characteristics of Narragansett. The localized pockets of HSG A soils are consistent with an overall HSG C for the whole site due to the other aspects observed. HSG A infiltration rate of 2.41 in/hr per the Rawl's Chart for drainage have therefore been applied within stormwater infiltration areas.

To evaluate the site drainage conditions from pre-development to post-development, the project site has been divided into four subcatchment areas (SC1.0, SC2.0, SC3.0 and SC4.0) and their associated analysis point (AP1, AP2, AP3 and AP4) under the pre-development scenario, as shown on the plan entitled "WATERSHED MAP – EXISTING CONDITIONS", see attached.

SC1.0 outlines a subcatchment area located on the north portion of the project site adjacent to Shaw Drive. SC1.0 generally flows north and west towards a low point located at the northwestern corner of the project site and shall be noted as AP1.

SC2.0 outlines a subcatchment area located at the southwestern portion of the project site and generally flows west onto the adjacent property and shall be noted as AP2.

SC3.0 outlines a subcatchment area located on the southeastern portion of the project site and generally flows south onto the adjacent property and shall be noted as AP3.

SC4.0 outlines a subcatchment area located on the southern portion of the project site between SC2.0 and SC3.0, and generally flows south onto the adjacent property and shall be noted as AP4.

## Project Description

This purpose of this project is to create a residential subdivision with 3 lots. Lot 1 shall be noted as the lot located on the northeastern portion of the project site adjacent to Shaw Drive. Lot 2 shall be noted as the lot located at the southwestern portion of the project site. Lot 3 shall be noted as the lot located at the south eastern portion of the project site. Each lot will be serviced by an onsite subsurface sewage disposal system and municipal service connection. The development includes the construction of the three (3) 5-bedroom single-family dwellings, supporting utilities, stormwater management system, and associated clearing, grading and grubbing. A proposed roadway "Five Paths Court" will provide access to each of the residential dwelling within the right of way.

The on-site stormwater runoff generated by the proposed impervious area (Pavement & roof) is to be collected and pre-treated prior to entering the two proposed Infiltration Chambers (IC) system. The Infiltration Chambers will provide sufficient stormwater infiltration and retention to mitigate the increase in overall impervious area from the proposed development per Massachusetts Stormwater Handbook.

Under the post-development scenario, the project has been divided into (14) subcatchment areas shown on the plan entitled "WATERSHED MAP – PROPOSED CONDITIONS", see attached.

SC1.1 outlines an area draining into a double grate catch basin (DCB4), which will drain directly into the Infiltration Chambers (IC-1) located on Lot 1. SC1.1 will capture a portion of the existing pavement and wooded area from the adjacent property east of the project site, proposed roof runoff and a portion of the proposed paved driveway of the proposed single-family dwelling on Lot 1.

SC1.2 outlines an area consisting of a portion of the existing paved driveway and roof runoff from the adjacent property, a portion of the proposed driveway from Lot 1, grass and wooded area, and a portion of the proposed roadway. SC1.2 will be collected by a double grate catch basin (DCB3) and continue to flow into a drain manhole (DMH1) which will ultimately flow into IC-1.

SC1.3 and SC1.4 outline a portion of the proposed roadway to be collected by two catch basins located on the proposed roadway (CB2 and CB1 respectively). Both catch basins will flow into DMH1 similar to DCB3.

SC1.5 outlines an area that is mostly undisturbed except for tree clearing as required to construct the proposed roadway and Pipe End Structure (PES-1). The Pipe End Structure is an overflow outlet structure for IC-1, which will allow any overflow out of IC-1 to continue to flow towards AP1.

SC1.6 outlines an area of the proposed roadway coming off the edge of pavement of Shaw Drive. Stormwater runoff from SC1.6 is separated from the rest of the other subcatchments by a high point on Five Paths Court, in order to keep stormwater runoff the development separate from Shaw Drive. Stormwater runoff from SC1.6 is limited to approximately 622± sq. ft. of untreated pavement runoff.

SC2.1 outlines an area consisting of the proposed roof runoff from the proposed building on Lot 2 and a portion of the lawn that will get collected by a stone diaphragm (SD-1). SD-1 is a shallow structure that can retain stormwater runoff prior to overflowing and allowing runoff to continue downhill and into AP2.

SC2.2 outlines an area outside of SC2.1, consisting of existing wooded area and lawn area of the proposed residential building of Lot 2. SC2.2 will remain mostly undisturbed except for tree clearing for the lawn area and will continue to flow into AP2 similar to pre-development.

SC3.1 outlines an area consisting of the existing roof runoff, lawn area, and wooded area from the adjacent property east of the project site, as well as a portion of the roof runoff from the proposed building on Lot 3 and lawn area. Runoff from SC3.1 will be collected by a double grate catch basin (DCB5) and continue into a drain manhole (DMH2), which will ultimately discharge into an Infiltration Chamber system (IC-2) located south of the proposed building on Lot 3.

SC3.2 outlines an area consisting of wooded area, lawn area and a portion of the proposed building roof on Lot 3. Runoff from SC3.2 will get collected by a double grate catch basin (DCB7) and flowing directly into the Infiltration chambers (IC-2).

SC3.3 outlines an area that is mostly undisturbed with the exception for tree clearing as needed for the construction of the proposed onsite septic leaching area and Infiltration Chambers (IC-2) near the proposed building of Lot 3. SC3.3 will continue to flow into AP3 similar to predevelopment.

SC3.4 outlines an area that that is mostly lawn area and a portion of the driveway runoff from Lot 2. Runoff from SC3.4 will get collected by a double grate catch basin (DCB6) and flow into a drain manhole (DMH2), similar to SC3.1.

SC4.1 outlines the lawn area for Lot 2 that will get collected by a stone diaphragm (SD-2) to retain the stormwater runoff generated by the tree clearing. SD-2 will overflow and allow runoff to continue downhill and into AP4.

SC4.2 outlines an area that is mostly undisturbed that will continue to flow into AP4 similar to predevelopment.

The proposed BMP's have been designed in accordance with the Massachusetts Stormwater Standards, and the Town of Wayland Bylaws Chapter 193 to attenuate peak flows, retain runoff volumes, treat runoff from impervious surfaces and maintain groundwater recharge to predevelopment conditions.

## Hydrologic and Hydraulic Computation Methodology

Runoff rates and volume were computed using the Soil Conservation Service TR-20 Method entitled "Urban Hydrology for Small Watersheds". The following 24-hour rainfall events were analyzed:

Frequency: 0.5", 1.0", 2-yr, 10-yr, 25-yr and 100-yr

The rainfall depths for each storm were taken from the latest available updates from the Northeast Regional Climate Center (NRCC).

As outlined above, runoff from the site has been analyzed at four points under the predevelopment and post-development conditions. As a standard for comparison, AP1, AP2, AP3 and AP4 are represented in both the pre and the post development cases.

### Summary of Results

Peak discharge rates and volumes of the calculated runoff for both conditions analyzed are displayed in the HYDROLOGY SUMMARY that follows. As shown within the summary, the peak discharge rates at all four analysis points for all analyzed storm events are less than or equal to those under pre-development conditions with the exception for the peak discharge volume of the 0.5" and 1" storm events for AP1, AP2 and AP4.

The deep sump hooded catch basins, stone diaphragms and infiltration chambers work together to provide an expected site wide Total Suspended Solids (TSS) removal of 84%.

The infiltration chambers retain and infiltrate 6,481 cubic feet of runoff prior to discharging, well in excess of the minimum required 544 cubic feet occurring under existing conditions and displaced by the proposed development.

The proposed development meets the MADEP Stormwater Management Standards through the use of Best Management Practices that address groundwater recharge, water quality (first flush) retention, and suspended solids removal within sustainable BMP's. See Appendix for computed solids quantities / removal process trains, and water quality runoff volumes.

## HYDROLOGY SUMMARY FOR 24-HOUR STORM

#### Five Paths Wayland, MA Project No. 171053

### PEAK DISCHARGE RATE

| Pre-Development (cfs) |     |     |      |       |       |        |
|-----------------------|-----|-----|------|-------|-------|--------|
| Analysis Point        | .5" | 1"  | 2-YR | 10-YR | 25-YR | 100-YR |
| AP1                   | 0.0 | 0.0 | 4.5  | 10.5  | 15.8  | 27.2   |
| AP2                   | 0.0 | 0.0 | 1.1  | 2.6   | 3.8   | 6.6    |
| AP3                   | 0.0 | 0.0 | 3.0  | 7.4   | 11.3  | 19.7   |
| AP4                   | 0.0 | 0.0 | 0.5  | 1.0   | 1.4   | 2.2    |

### **Development (cfs)**

| Analysis Point | .5" | 1"  | 2-YR | 10-YR | 25-YR | 100-YR |
|----------------|-----|-----|------|-------|-------|--------|
| AP1            | 0.0 | 0.0 | 2.1  | 10.0  | 15.5  | 26.1   |
| AP2            | 0.0 | 0.0 | 1.1  | 2.4   | 3.5   | 5.8    |
| AP3            | 0.0 | 0.0 | 2.7  | 7.3   | 11.3  | 19.6   |
| AP4            | 0.0 | 0.0 | 0.4  | 0.8   | 1.1   | 1.8    |

### Pre-Development vs. Developed (cfs)

| Analysis Point | .5" | 1"  | 2-YR | 10-YR | 25-YR | 100-YR |
|----------------|-----|-----|------|-------|-------|--------|
| AP1            | 0.0 | 0.0 | -2.4 | -0.5  | -0.3  | -1.1   |
| AP2            | 0.0 | 0.0 | 0.0  | -0.2  | -0.3  | -0.8   |
| AP3            | 0.0 | 0.0 | -0.3 | -0.1  | 0.0   | -0.1   |
| AP4            | 0.0 | 0.0 | -0.1 | -0.2  | -0.3  | -0.4   |

### PEAK DISCHARGE VOLUME

### **Pre-Development (Cubic feet)**

| Analysis Point | .5" | 1"  | 2-YR   | 10-YR  | 25-YR  | 100-YR |
|----------------|-----|-----|--------|--------|--------|--------|
| AP1            | 0   | 213 | 16,177 | 36,167 | 53,979 | 93,791 |
| AP2            | 0   | 53  | 3,992  | 8,924  | 13,319 | 23,144 |
| AP3            | 0   | 124 | 13,814 | 31,474 | 47,335 | 82,984 |
| AP4            | 0   | 122 | 1,798  | 3,482  | 4,894  | 7,922  |

#### **Development (Cubic feet)**

| Analysis Point | .5" | 1"  | 2-YR  | 10-YR  | 25-YR  | 100-YR |
|----------------|-----|-----|-------|--------|--------|--------|
| AP1            | 16  | 71  | 9,137 | 30,413 | 49,176 | 90,983 |
| AP2            | 0   | 74  | 3,456 | 7,554  | 11,176 | 19,178 |
| AP3            | 0   | 40  | 9,469 | 27,435 | 43,464 | 79,448 |
| AP4            | 14  | 165 | 1,768 | 3,412  | 4,783  | 7,719  |

### Pre-Development vs. Developed (Cubic feet)

| Analysis Point | .5" | 1"   | 2-YR   | 10-YR  | 25-YR  | 100-YR |
|----------------|-----|------|--------|--------|--------|--------|
| AP1            | 16  | -142 | -7,040 | -5,754 | -4,803 | -2,808 |
| AP2            | 0   | 21   | -536   | -1,370 | -2,143 | -3,966 |
| AP3            | 0   | -84  | -4,345 | -4,039 | -3,871 | -3,536 |
| AP4            | 14  | 43   | -30    | -70    | -111   | -203   |



## Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands Program Checklist for Stormwater Report

## A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.<sup>1</sup> This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8<sup>2</sup>
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

<sup>&</sup>lt;sup>1</sup> The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

<sup>&</sup>lt;sup>2</sup> For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



## **B. Stormwater Checklist and Certification**

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

## **Registered Professional Engineer's Certification**

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



7/15/202 Signature and Date

Checklist

**Project Type:** Is the application for new development, redevelopment, or a mix of new and redevelopment?

New development

Redevelopment

Mix of New Development and Redevelopment



**LID Measures:** Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

| No disturbance to any Wetland Reso | urce Areas |
|------------------------------------|------------|
|------------------------------------|------------|

- Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- Reduced Impervious Area (Redevelopment Only)
- Minimizing disturbance to existing trees and shrubs
- LID Site Design Credit Requested:
  - Credit 1
  - Credit 2
  - Credit 3
- Use of "country drainage" versus curb and gutter conveyance and pipe
- Bioretention Cells (includes Rain Gardens)
- Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- Treebox Filter
- U Water Quality Swale
- Grass Channel
- Green Roof
- Other (describe):

### **Standard 1: No New Untreated Discharges**

- No new untreated discharges
- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



### Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

Calculations provided to show that post-development peak discharge rates do not exceed predevelopment rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24hour storm.

### Standard 3: Recharge

| $\boxtimes$ | Soil | Anal | ysis | provided. |
|-------------|------|------|------|-----------|
|-------------|------|------|------|-----------|

- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.

| Static Static |  |
|---------------|--|
|---------------|--|

Dynamic Field<sup>1</sup>

Runoff from all impervious areas at the site discharging to the infiltration BMP.

Simple Dynamic

Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

| $\boxtimes$ | Recharge BMPs ha | ave been sized to | infiltrate the | Required F | Recharge Volume. |
|-------------|------------------|-------------------|----------------|------------|------------------|
|-------------|------------------|-------------------|----------------|------------|------------------|

- Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
  - Site is comprised solely of C and D soils and/or bedrock at the land surface
  - M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
  - Solid Waste Landfill pursuant to 310 CMR 19.000
  - Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- $\boxtimes$  Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

<sup>&</sup>lt;sup>1</sup> 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



### Standard 3: Recharge (continued)

- The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

### **Standard 4: Water Quality**

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
- ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
  - is within the Zone II or Interim Wellhead Protection Area
  - is near or to other critical areas
  - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
  - involves runoff from land uses with higher potential pollutant loads.
- The Required Water Quality Volume is reduced through use of the LID site Design Credits.
- Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



| Checklist ( | continued) |
|-------------|------------|
|-------------|------------|

### Standard 4: Water Quality (continued)

- The BMP is sized (and calculations provided) based on:
  - The ½" or 1" Water Quality Volume or
  - The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

#### Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does *not* cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has *not* been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

#### **Standard 6: Critical Areas**

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



# Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

| Limited Project |
|-----------------|
|                 |

Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

- Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- Bike Path and/or Foot Path
- Redevelopment Project
- Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

### Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



# Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has *not* been included in the Stormwater Report but will be submitted *before* land disturbance begins.
- The project is *not* covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

### **Standard 9: Operation and Maintenance Plan**

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
  - Name of the stormwater management system owners;
  - Party responsible for operation and maintenance;
  - Schedule for implementation of routine and non-routine maintenance tasks;
  - Plan showing the location of all stormwater BMPs maintenance access areas;
  - Description and delineation of public safety features;
  - Estimated operation and maintenance budget; and
  - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
  - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
  - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

### Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted *prior to* the discharge of any stormwater to post-construction BMPs.





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| MAP INFORMATION | The soil surveys that comprise your AOI were mapped at 1:25,000.  | Warning: Soil Map may not be valid at this scale. | Enlargement of maps beyond the scale of mapping can cause<br>misunderstanding of the detail of mapping and accuracy of soil | line placement. The maps do not show the small areas of<br>contrasting soils that could have been shown at a more detailed<br>scale. |                               | Please rely on the bar scale on each map sheet for map measurements. |  | Source of Map: Natural Resources Conservation Service<br>Web Soil Survey URL: | Coordinate System: Web Mercator (EPSG:3857) | Maps from the Web Soil Survey are based on the Web Mercator | projection, which preserves direction and shape but distorts | usiance and area. A projection that preserves area, ouch as the<br>Albers equal-area conic projection, should be used if more | accurate calculations of distance or area are required. | This product is generated from the USDA-NRCS certified data as | of the version date(s) listed below. | Soil Survey Area: Middlesex County, Massachusetts | Survey Area Data: Version 19, Sep 12, 2019 | Soil map units are labeled (as space allows) for map scales | 1:50,000 or larger.  | Date(s) aerial images were photographed: Jul 28, 2019—Aug | 15, 2019      | The orthophoto or other base map on which the soil lines were<br>compiled and digitized probably differs from the background<br>imagery displayed on these maps. As a result, some minor<br>shifting of map unit boundaries may be evident. |
|-----------------|---|---|---|--|-------------------------------|--|--|---|---|---|--|---|---|--|--------------------------------------|---|--|---|----------------------|---|---------------|---|
| MAP LEGEND      | Area of Interest (AOI)     Result     Spoil Area       Area of Interest (AOI)     Area     Area of Interest (AOI) | Soils Soil Map Unit Polygons ON Very Stony Spot   | Soil Map Unit Points  | Special Point Features<br>Blowout Water Features   | Borrow Pit Streams and Canals | Clay Spot     Transportation     Added and a spot                    | <ul> <li>Closed Depression</li> <li>Interstate Highways</li> </ul> | Gravel Pit US Routes  | 🔹 Gravelly Spot                             | 💿 Landfill 📃 🔬 Local Roads                                  | 🙏 Lava Flow Background                                       | 👞 Marsh or swamp 🜉 Aerial Photography   | 🙊 Mine or Quarry  | Miscellaneous Water  | Perennial Water                      | Rock Outerop                                      | + Saline Spot                              | Sandy Spot  | Severely Eroded Spot | Sinkhole  | Slide or Slip | Ø Sodic Spot  |

# Map Unit Legend

| Map Unit Symbol             | Map Unit Name   | Acres in AOI | Percent of AOI |
|-----------------------------|---|--------------|----------------|
| 71B                         | Ridgebury fine sandy loam, 3 to<br>8 percent slopes, extremely<br>stony | 0.2          | 0.4%           |
| 106C                        | Narragansett-Hollis-Rock<br>outcrop complex, 3 to 15<br>percent slopes  | 25.2         | 43.7%          |
| 106D                        | Narragansett-Hollis-Rock<br>outcrop complex, 15 to 25<br>percent slopes | 29.5         | 51.1%          |
| 251B                        | Haven silt loam, 3 to 8 percent slopes                                  | 2.7          | 4.8%           |
| Totals for Area of Interest |   | 57.6         | 100.0%         |

No. 171053

4

Date: 8/31/18

# Commonwealth of Massachusetts Wayland Massachusetts

# Soil Suitability Assessment for On-Site Sewage Disposal

| Performed by: Jude Gauvin, GPR                              | Date: 4/26/18                               |
|---|---|
| Witnessed by: Darren MacCaughney, RS, WBOH                  |   |
|   |   |
| Location Address:   | Owner's Name: Ross Wilkinson                |
| or Lot No. 57 Shaw Dr                                       | Address: 29 Collins Rd                      |
| Wayland, MA   | Wilton, NH 03086                            |
|   |   |
|   | Telephone No.                               |
| New Construction 🗹 Upgrade 🔲 Repair                         |   |
| Office Parion   |   |
| Published Soil Survey Available: No Ves                     |   |
| Vear Published Internet Publication Scale                   | na Soil Man Unit 106 C/D                    |
| Soil Name Narragansett-Hollis-rock-outcron Soil Limitations | Depth to restrictive features, well drained |
| Soil Name Soil Limitations                                  | Depth to restrictive reatures, wen utalied  |
| Soil Name Soil Limitations                                  |   |
| Surficial Geologic Report Available: No Ves                 | Г   |
| Year Published MASS GIS Publication Scale                   | -   |
| Geologic Material(Map Unit) Glacial Till                    |   |
| Landform Ground Morraine                                    |   |
|   |   |
| Flood Insurance Rate Map: 25017C0528F                       |   |
| Above 500 Year Flood Boundary No 🗌 Yes                      |   |
| Within 500 Year Flood Boundary No 🗹 Yes                     |   |
| Within 100 Year Flood Boundary No 🗹 Yes                     |   |
| Within Velocity Zone No 🗹 Yes                               |   |
| Wotland Area:   |   |
| National Wetlands Inventory Man (man unit) N/A              |   |
| Wetlands Conservancy Program Man (map unit) N/A             |   |
| wettands conservancy i rogram wap (map unit)                |   |
| Current Water Resource Conditions (USGS): Month             | Mav   |
| Range: Above Normal 🔲 Normal 🗹 Below Norm                   | al 🗆  |
| Other Reference Reviewed USGS                               |   |
|   |   |
|   |   |
|   |   |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:        | 418-1 Date        | : 04/26/18 Tim  | e: 8:3    | 0 AM     | Weather:        | Sunny 60° |
|---------------------|-------------------|-----------------|-----------|----------|-----------------|-----------|
| Location (identify  | on site plan)     | See Attached S  | ketch     |          |                 |           |
| Land Use Woodl      | and               | Slope (%)       | 2%-6%     |          | Surfaces Stones | none      |
| (eg woodland, agri  | cultural field, v | acant lot etc)  |           |          |                 |           |
| Vegatation mixed    | hardwoods and     | pines           |           |          |                 |           |
| Landform Ground     | l Morraine        |                 |           |          |                 |           |
| Position on landsca | ape See a         | attached Sketch |           |          |                 |           |
| Distances from:     |                   |                 |           |          |                 |           |
| Open Wa             | ater Body >100    | feet Drai       | nage Way  | >100 fee | et              |           |
| Possible            | Wet Area >100     | feet Prop       | erty Line | >50 fee  | et              |           |
| Drinking W          | ater Well >100    | feet Othe       | er:       |          |                 |           |
|                     |                   | <del>.</del>    |           | 0        |                 |           |

feet

|                                   | Deep Observation Hole Log |                        |   |                  |   |  |  |  |  |
|-----------------------------------|---------------------------|------------------------|---|------------------|---|--|--|--|--|
| Hole # 418-1 NB 30/18 Suface El.  |                           |                        |   |                  |   |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)                     | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |
| 0-4<br>4-32<br>32-88<br>88-108    | A<br>B<br>C1<br>C2        | sl<br>Is<br>fsl<br>Is  | 10YR 3/2<br>10YR 5/6<br>10YR 6/1<br>10YR5/4 | None<br>@90      | loose, cr, roots<br>roots, abk<br>roots, loose<br>abk, mvfr     |  |  |  |  |

| Parent Material (geologic) Glacial Till          |     | Depth to Bedrock: >108"    |
|--|-----|----------------------------|
| Depth to Groundwater: Standing Water in the Hole | 98" | Weeping from Pit Face: 90" |
| Estimated Seasonal High Groundwater in the Hole  | 90" |                            |
| Aditional Notes                                  |     |                            |
|  |     |                            |
|  |     |                            |
|  |     |                            |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-2 Date         | : 04/26/18 Ti   | ne: 9      | 9:00 AM | Weather:        | Sunny 60° |
|--------------------|--------------------|-----------------|------------|---------|-----------------|-----------|
| Location (identify | on site plan)      | See Attached    | Sketch     |         |                 |           |
| Land Use Wood      | land               | Slope (%)       | 2%-6%      |         | Surfaces Stones | none      |
| (eg woodland, agr  | icultural field, v | acant lot etc   | )          |         |                 |           |
| Vegatation mixed   | hardwoods and      | pines           |            |         |                 |           |
| Landform Groun     | d Morraine         |                 |            |         |                 |           |
| Position on landsc | ape See            | attached Sketch | (          |         |                 |           |
| Distances from:    |                    |                 |            |         |                 |           |
| Open W             | ater Body >100     | feet Dra        | ainage Way | >100    | feet            |           |
| Possible           | Wet Area >100      | feet Pro        | perty Line | >50     | feet            |           |
| Drinking W         | ater Well >100     | feet Otl        | ner:       |         |                 |           |
|                    |                    | -               |            |         | <b>C</b>        |           |

feet

|                                   | Deep Observation Hole Log |                        |   |                  |   |  |  |  |  |
|-----------------------------------|---------------------------|------------------------|---|------------------|---|--|--|--|--|
| Hole # 418-2 NB 30/18 Suface El.  |                           |                        |   |                  |   |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)                     | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |
| 0-4<br>4-24<br>24-62<br>62-112    | A<br>B<br>C1<br>C2        | sl<br>ls<br>fsl<br>ls  | 10YR 3/2<br>10YR 5/6<br>10YR 6/1<br>10YR5/4 | None<br>>112"    | loose, cr, roots<br>roots, abk<br>roots, loose<br>abk, mvfr     |  |  |  |  |

| Parent Material (geologic) Glacial Till          | ~     | Depth to Bedrock: >112"     |
|--|-------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None  | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >112" |                             |
| Aditional Notes                                  |       |                             |
|  |       |                             |
|  |       |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-3 Date         | : 04/26/18 Time | e: 10:45  | 5 AM      | Weather:        | Sunny 60° |
|--------------------|--------------------|-----------------|-----------|-----------|-----------------|-----------|
| Location (identify | on site plan)      | See Attached S  | ketch     |           |                 |           |
| Land Use Wood      | land               | Slope (%)       | 2%-6%     |           | Surfaces Stones | none      |
| (eg woodland, agr  | icultural field, v | acant lot etc)  |           | -         | 9.0             |           |
| Vegatation mixed   | hardwoods and      | pines           |           |           |                 |           |
| Landform Groun     | d Morraine         |                 |           |           |                 |           |
| Position on landsc | ape See a          | ttached Sketch  |           |           |                 |           |
| Distances from:    |                    |                 |           |           |                 |           |
| Open W             | ater Body >100     | feet Drain      | nage Way  | >100 feet |                 |           |
| Possible           | Wet Area >100      | feet Prop       | erty Line | >50 feet  |                 |           |
| Drinking W         | ater Well >100     | feet Othe       | r:        |           |                 |           |
|                    |                    |                 |           | fact      |                 |           |

teet

|            | Deep Observation Hole Log        |              |            |          |                              |  |  |  |  |
|------------|----------------------------------|--------------|------------|----------|------------------------------|--|--|--|--|
| Hole # 418 | Hole # 418-3 NB 30/18 Suface El. |              |            |          |                              |  |  |  |  |
| Depth from | Soil                             | Soil Texture | Soil Color | Soil     | Other                        |  |  |  |  |
| Surface    | Horizon                          | (USDA)       | (MUNSELL)  | Mottling | (Stucture, Stones, Boulders, |  |  |  |  |
| (inches)   |                                  |              |            |          | Consistency, % Gravel)       |  |  |  |  |
| 0-4        | A                                | sl           | 10YR 3/2   |          | loose, cr, roots             |  |  |  |  |
| 4-34       | В                                | ls           | 10YR 5/6   | @116     | mvfr, roots, abk             |  |  |  |  |
| 34-116     | C                                | ls           | 10YR 5/4   |          | mvfr, abk                    |  |  |  |  |
|            |                                  |              |            |          |                              |  |  |  |  |
|            |                                  |              |            |          |                              |  |  |  |  |
|            |                                  |              |            |          |                              |  |  |  |  |
|            |                                  |              |            |          |                              |  |  |  |  |
|            |                                  |              |            |          |                              |  |  |  |  |
|            |                                  |              |            |          |                              |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: 116"             |
|--|------|------------------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None        |
| Estimated Seasonal High Groundwater in the Hole  | 116" |                                    |
| Aditional Notes                                  |      |                                    |
|  |      |                                    |
|  |      |                                    |
|  |      | ********************************** |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-4        | Date:    | 04/26/18      | Time:  |          | 10:30 | AM   |            | Weathe     | er: | Sunny 60° |
|--------------------|--------------|----------|---------------|--------|----------|-------|------|------------|------------|-----|-----------|
| Location (identify | on site pla  | an)      | See Attach    | ned Sk | etch     |       |      |            |            |     |           |
| Land Use Wood      | land         |          | Slope (%)     |        | 2%-6%    |       |      | Surf       | faces Ston | es  | none      |
| (eg woodland, agri | icultural fi | ield, va | icant lot etc | )      |          |       |      |            |            |     |           |
| Vegatation mixed   | hardwood     | ls and j | pines         |        |          |       |      |            |            |     |           |
| Landform Groun     | d Morrain    | e        |               |        |          |       |      |            |            |     |           |
| Position on landsc | ape          | See at   | tached Ske    | tch    |          |       |      |            |            |     |           |
| Distances from:    |              |          |               |        |          |       |      |            |            |     |           |
| Open W             | ater Body    | >100     | feet          | Draina | age Way  |       | >100 | feet       |            |     |           |
| Possible           | Wet Area     | >100     | feet          | Proper | rty Line |       | >50  | feet       |            |     |           |
| Drinking W         | ater Well    | >100     | feet          | Other: |          |       |      |            |            |     |           |
|                    |              |          |               |        |          |       |      | <b>c</b> . |            |     |           |

feet

| Deep Observation Hole Log         |                    |                        |   |                  |   |  |  |  |  |  |  |
|-----------------------------------|--------------------|------------------------|---|------------------|---|--|--|--|--|--|--|
| Hole # 418                        | -4                 | NB 30/20               |   |                  | Suface El.  |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon    | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)                     | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |
| 0-4<br>4-28<br>28-56<br>56-120    | A<br>B<br>C1<br>C2 | sl<br>Is<br>fsl<br>Is  | 10YR 3/2<br>10YR 5/6<br>10YR 6/1<br>10YR5/4 | @120             | loose, cr, roots<br>roots, abk<br>roots, loose<br>abk, mvfr     |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: 120"      |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | 120" |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-5       | Date:    | 04/26/18     | Time:    | 2     | :15 PM | Weather:        | Sunny 60° |
|--------------------|-------------|----------|--------------|----------|-------|--------|-----------------|-----------|
| Location (identify | on site pl  | an)      | See Attac    | hed Sket | ch    |        |                 |           |
| Land Use Wood      | land        |          | Slope (%)    | )        | 2%    |        | Surfaces Stones | none      |
| (eg woodland, agr  | icultural f | ield, va | icant lot et | ic)      |       |        | ,               |           |
| Vegatation mixed   | hardwood    | ds and j | pines        |          |       |        |                 |           |
| Landform Groun     | d Morrair   | ne       |              |          |       |        |                 |           |
| Position on landsc | ape         | See at   | tached Sk    | etch     |       |        |                 |           |
| Distances from:    |             |          |              |          |       |        |                 |           |
| Open W             | ater Body   | >100     | feet         | Drainag  | e Way | >100   | feet            |           |
| Possible           | Wet Area    | >100     | feet         | Property | Line  | >50    | feet            |           |
| Drinking W         | ater Well   | >100     | feet         | Other:   |       |        |                 |           |
|                    |             |          |              |          |       |        | <b>C</b> .      |           |

feet

| Deep Observation Hole Log |                 |                        |                                  |                  |  |  |  |  |  |  |  |
|---------------------------|-----------------|------------------------|----------------------------------|------------------|--|--|--|--|--|--|--|
| Hole # 418                | -5              |                        | Suface El.                       |                  |  |  |  |  |  |  |  |
| Depth from<br>Surface     | Soil<br>Horizon | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,              |  |  |  |  |  |  |
| (inches)                  |                 | . ,                    | ,                                | 0                | Consistency, % Gravel)                             |  |  |  |  |  |  |
| 0-4<br>4-28<br>28-96      | A<br>B<br>C     | sl<br>ls<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 | @80"             | loose, cr, roots<br>roots, mvfr<br>mfr, 10% gravel |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          | Depth to Bedrock: >96" |                        |     |
|--|------------------------|------------------------|-----|
| Depth to Groundwater: Standing Water in the Hole | 92"                    | Weeping from Pit Face: | 92" |
| Estimated Seasonal High Groundwater in the Hole  | 80"                    |                        |     |
| Aditional Notes                                  |                        |                        |     |
|  |                        |                        |     |
|  |                        |                        |     |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-6 Date        | : 04/26/18   | Time:         | 2:15 PM | Weather:        | Sunny 60° |
|--------------------|-------------------|--------------|---------------|---------|-----------------|-----------|
| Location (identify | on site plan)     | See Attacl   | hed Sketch    |         |                 |           |
| Land Use Wood      | and               | Slope (%)    | 2%            |         | Surfaces Stones | none      |
| (eg woodland, agri | cultural field, v | acant lot et | c)            |         |                 |           |
| Vegatation mixed   | hardwoods and     | pines        |               |         |                 |           |
| Landform Ground    | d Morraine        |              |               |         |                 |           |
| Position on landsc | ape See           | ttached Ske  | etch          |         |                 |           |
| Distances from:    |                   |              |               |         |                 |           |
| Open W             | ater Body >100    | feet         | Drainage Way  | >100 ±  | feet            |           |
| Possible           | Wet Area >100     | feet         | Property Line | >50 ±   | feet            |           |
| Drinking W         | ater Well >100    | feet         | Other:        |         |                 |           |
|                    |                   |              |               |         | C4              |           |

feet

| Deep Observation Hole Log         |                 |                        |                                  |                  |   |  |  |  |  |  |  |
|-----------------------------------|-----------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|
| Hole # 418                        | -6              |                        | Suface El.                       |                  |   |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |
| 0-6<br>6-22<br>22-96              | A<br>B<br>C     | sl<br>ls<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 | @80"             | loose, cr, roots<br>roots, mvfr<br>mfr, 10% gravel              |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |     | Depth to Bedrock: >96"     |
|--|-----|----------------------------|
| Depth to Groundwater: Standing Water in the Hole | 92" | Weeping from Pit Face: 92" |
| Estimated Seasonal High Groundwater in the Hole  | 80" |                            |
| Aditional Notes                                  |     |                            |
|  |     |                            |
|  |     |                            |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-7        | Date:   | 04/26/18    | Time:     |        | 2:15 PM | Weather:        | Sunny 60° |
|--------------------|--------------|---------|-------------|-----------|--------|---------|-----------------|-----------|
| Location (identify | on site pla  | in)     | See Attac   | hed Skete | ch     |         |                 |           |
| Land Use Wood      | land         |         | Slope (%)   |           | 2%     |         | Surfaces Stones | none      |
| (eg woodland, agri | icultural fi | eld, va | cant lot et | c)        |        |         |                 |           |
| Vegatation mixed   | hardwood     | s and j | pines       |           |        |         |                 |           |
| Landform Ground    | d Morraine   | e       |             |           |        |         |                 |           |
| Position on landsc | ape          | See at  | tached Sk   | etch      |        |         |                 |           |
| Distances from:    | 34 ·         |         |             |           |        |         |                 |           |
| Open W             | ater Body    | >100    | feet        | Drainag   | e Way  | >100    | feet            |           |
| Possible           | Wet Area     | >100    | feet        | Property  | / Line | >50     | feet            |           |
| Drinking W         | ater Well    | >100    | feet        | Other:    |        |         |                 |           |
|                    |              |         |             |           |        |         | C               |           |

feet

| Deep Observation Hole Log         |                       |                        |                                  |                  |   |  |  |  |  |  |  |
|-----------------------------------|-----------------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|
| Hole # 418                        | Hole # 418-7 NB 30/20 |                        |                                  |                  |   |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon       | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |
| 0-6<br>6-24<br>24-78              | A<br>B<br>C           | sl<br>ls<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 | @50"             | loose, cr, roots<br>roots, mvfr<br>mfr, 10% gravel              |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |         | Depth to Bedrock: >78" |     |
|--|---------|------------------------|-----|
| Depth to Groundwater: Standing Water in the Hole | 56"     | Weeping from Pit Face: | 56" |
| Estimated Seasonal High Groundwater in the Hole  | 80"     |                        |     |
| Aditional Notes                                  | ••••••• |                        |     |
|  |         |                        |     |
|  |         |                        |     |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 418-8      | Date:    | 04/26/18     | Time:     | 2     | :15 PM |          | Weather:   | Sunny 60° |
|--------------------|------------|----------|--------------|-----------|-------|--------|----------|------------|-----------|
| Location (identify | on site pl | an)      | See Attac    | hed Sketo | h     |        |          |            |           |
| Land Use Woodl     | and        |          | Slope (%)    | )         | 2%    |        | Surfa    | ces Stones | none      |
| (eg woodland, agri | cultural f | ield, va | acant lot et | tc)       |       |        |          |            |           |
| Vegatation mixed   | hardwood   | ls and   | pines        |           |       |        |          |            |           |
| Landform Ground    | d Morrain  | e        |              |           |       |        |          |            |           |
| Position on landsc | ape        | See a    | ttached Sk   | etch      |       |        |          |            |           |
| Distances from:    |            |          |              |           |       |        |          |            |           |
| Open W             | ater Body  | >100     | feet         | Drainage  | e Way | >100   | feet     |            |           |
| Possible           | Wet Area   | >100     | feet         | Property  | Line  | >50    | feet     |            |           |
| Drinking W         | ater Well  | >100     | feet         | Other:    |       |        |          |            |           |
|                    |            |          |              |           |       |        | <b>C</b> |            |           |

feet

| Deep Observation Hole Log |         |              |            |          |                              |  |  |
|---------------------------|---------|--------------|------------|----------|------------------------------|--|--|
| Hole # 418                | -8      | NB 30/20     |            |          | Suface El.                   |  |  |
| Depth from                | Soil    | Soil Texture | Soil Color | Soil     | Other                        |  |  |
| Surface                   | Horizon | (USDA)       | (MUNSELL)  | Mottling | (Stucture, Stones, Boulders, |  |  |
| (inches)                  |         |              |            |          | Consistency, % Gravel)       |  |  |
| 0-4                       | А       | sl           | 10YR 3/2   |          | loose, cr, roots             |  |  |
| 4-48                      | В       | ls           | 10YR 5/6   |          | roots, mvfr                  |  |  |
| 48-98                     | C       | ls           | 10YR 5/4   | @50"     | mfr, 10% gravel              |  |  |
|                           |         |              |            |          |                              |  |  |
|                           |         |              |            |          |                              |  |  |
|                           |         |              |            |          |                              |  |  |
|                           |         |              |            |          |                              |  |  |
|                           |         |              |            |          |                              |  |  |
|                           |         |              |            |          |                              |  |  |

| Parent Material (geologic) Glacial Till          |     | Depth to Bedrock: >98" |     |
|--|-----|------------------------|-----|
| Depth to Groundwater: Standing Water in the Hole | 62" | Weeping from Pit Face: | 62" |
| Estimated Seasonal High Groundwater in the Hole  | 50" |                        |     |
| Aditional Notes                                  |     |                        |     |
|  |     |                        |     |
|  |     |                        |     |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:         | 418-9 Date       | : 04/26/18 Tim  | e: 2      | :15 PM   | Weather:        | Sunny 60° |
|----------------------|------------------|-----------------|-----------|----------|-----------------|-----------|
| Location (identify o | on site plan)    | See Attached S  | ketch     |          |                 |           |
| Land Use Woodla      | and              | Slope (%)       | 2%        |          | Surfaces Stones | none      |
| (eg woodland, agric  | ultural field, v | acant lot etc)  |           |          |                 |           |
| Vegatation mixed h   | nardwoods and    | pines           |           |          |                 |           |
| Landform Ground      | Morraine         |                 |           |          |                 |           |
| Position on landsca  | pe See a         | attached Sketch |           |          |                 |           |
| Distances from:      |                  |                 |           |          |                 |           |
| Open Wa              | ter Body >100    | feet Drai       | nage Way  | >100 fee | t               |           |
| Possible V           | Wet Area >100    | feet Prop       | erty Line | >50 fee  | t               |           |
| Drinking Wa          | ater Well >100   | feet Othe       | r:        |          |                 |           |
|                      |                  |                 |           | fac      | +               |           |

.....feet

| Deep Observation Hole Log |                 |                        |                         |                  |                                    |  |  |
|---------------------------|-----------------|------------------------|-------------------------|------------------|------------------------------------|--|--|
| Hole # 418                | -9              | NB 30/20               |                         |                  | Suface El.                         |  |  |
| Depth from<br>Surface     | Soil<br>Horizon | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL) | Soil<br>Mottling | Other<br>(Stucture Stones Boulders |  |  |
| (inches)                  |                 | (00011)                | (MONDELE)               | Motting          | Consistency, % Gravel)             |  |  |
| 0-4                       | А               | sl                     | 10YR 3/2                |                  | loose, cr, roots                   |  |  |
| 4-34                      | В               | ls                     | 10YR 5/6                |                  | roots, mvfr                        |  |  |
| 34-84                     | C               | ls                     | 10YR 5/4                | @50"             | mfr, 10% gravel                    |  |  |
|                           |                 |                        |                         |                  |                                    |  |  |
|                           |                 |                        |                         |                  |                                    |  |  |
|                           |                 |                        |                         |                  |                                    |  |  |
|                           |                 |                        |                         |                  |                                    |  |  |

| Parent Material (geologic) Glacial Till          |     | Depth to Bedrock: 84"      |
|--|-----|----------------------------|
| Depth to Groundwater: Standing Water in the Hole | 76" | Weeping from Pit Face: 76" |
| Estimated Seasonal High Groundwater in the Hole  | 50" |                            |
| Aditional Notes                                  |     |                            |
|  |     |                            |
|  |     |                            |
Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #: 418-10 Date            | : 04/26/18 Time: | 2:15 PM     | Weather:        | Sunny 60° |
|-------------------------------------|------------------|-------------|-----------------|-----------|
| Location (identify on site plan)    | See Attached Ske | tch         |                 |           |
| Land Use Woodland                   | Slope (%)        | 2%          | Surfaces Stones | none      |
| (eg woodland, agricultural field, v | acant lot etc)   |             |                 |           |
| Vegatation mixed hardwoods and      | pines            |             |                 |           |
| Landform Ground Morraine            |                  |             |                 |           |
| Position on landscape See a         | ttached Sketch   |             |                 |           |
| Distances from:                     |                  |             |                 |           |
| Open Water Body >100                | feet Drainag     | ge Way >100 | feet            |           |
| Possible Wet Area >100              | feet Propert     | y Line >50  | feet            |           |
| Drinking Water Well >100            | feet Other:      |             |                 |           |
|                                     |                  |             | fast            |           |

feet

|            | Deep Observation Hole Log |              |            |          |                              |  |  |
|------------|---------------------------|--------------|------------|----------|------------------------------|--|--|
| Hole # 418 | -10                       | NB 30/20     |            |          | Suface El.                   |  |  |
| Depth from | Soil                      | Soil Texture | Soil Color | Soil     | Other                        |  |  |
| Surface    | Horizon                   | (USDA)       | (MUNSELL)  | Mottling | (Stucture, Stones, Boulders, |  |  |
| (inches)   |                           |              |            |          | Consistency, % Gravel)       |  |  |
| 0-4        | А                         | sl           | 10YR 3/2   |          | loose, cr, roots             |  |  |
| 4-34       | В                         | ls           | 10YR 5/6   |          | roots, mvfr                  |  |  |
| 34-64      | C                         | ls           | 10YR 5/4   | @50"     | mfr, 10% gravel              |  |  |
|            |                           |              |            |          |                              |  |  |
|            |                           |              |            |          |                              |  |  |
|            |                           |              |            |          |                              |  |  |
|            |                           |              |            |          |                              |  |  |
|            |                           |              |            |          |                              |  |  |
|            |                           |              |            |          |                              |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: 64"       |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | 50"  |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot#: 57 Shaw Dr Wayland, MA

# **Determination for Seasonal High Water Table**

#### Method Used:

|                     | Depth observed standing in observation hole inches   Depth weeping from side of observation hole inches   Depth to soil mottles * inches   See individual Reports   Ground water adjustment feet  |  |
|---------------------|---|--|
| Index Well          | ll Number Reading Date Index Well Level _   |  |
| Adjustmen           | nt Factor Adjusted Ground Water Level   |  |
| Depth of N          | Naturally Occuring Pervious Material  |  |
|                     | Does at least four feet of naturally occuring pervious material exist in all areas observed throughout the area proposed for the soil absorption system?  | Yes  |
|                     | If not, what is the depth of naturally occuring pervious material?  | Feet   |
| <u>Certificatio</u> | <u>on</u>   |  |
| Notes:              | I certify that I am currently approved by the Department of Environmental Prote<br>pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above anal<br>has been performed by me consistent with the training, expertise and experience<br>in 310 CMR 15.017. I further certify that the results of my soil evaluation, as inco<br>on the attached soil evaluation form, are accurate and in accordance with 310 CH<br>15.100 through 15.107.<br>Signature $\frac{8/31}{21}$ | ction<br>ysis<br>described<br>licated,<br>MR |
|                     |   |  |

## FORM 12 - PERCOLATION TEST

| Location Ad | ddress:                   | Owner's Name: | Ross Wilkinson                    |  |
|-------------|---------------------------|---------------|-----------------------------------|--|
| or Lot #    | 57 Shaw Dr<br>Wayland, MA | Address:      | 29 Collins Rd<br>Wilton, NH 03086 |  |
|             |                           | Telephone No. |                                   |  |

|                    | 04/26/18 1:51 PM<br>Date Time    | 04/26/18 1:52 PM<br>Date Time    |
|--------------------|----------------------------------|----------------------------------|
| Observation Hole # | 418-A                            | 418-B                            |
| Depth of Perc      | 46"                              | 46"                              |
| Start Pre-Soak     | 1:51 PM                          | 1:52 PM                          |
| End Pre-Soak       | 2:06 PM                          | 2:07 PM                          |
| Time @ 12"         | 2:06 PM                          | 2:07 PM                          |
| Time @ 9"          | 2:16 PM                          | 2:29 PM                          |
| Time @ 6"          | 2:23 PM                          | 2:48 PM                          |
| Time (9"-6")       | 7                                | 19                               |
| Rate (Min./Inch)   | 3                                | 7                                |
|                    | Test Passed: ☑<br>Test Failed: □ | Test Passed: ☑<br>Test Failed: □ |

Test performed By: Jude Gauvin, GPR

| Witnessed By: | Darren MacCaughney, RS WBOH |  |
|---------------|-----------------------------|--|
| Comments:     |                             |  |

418-AB

# FORM 12 - PERCOLATION TEST

| Location Ac                        | ldress: | Owner's Name: | Ross Wilkinson                             |  |
|------------------------------------|---------|---------------|--|--|
| or Lot # 57 Shaw Dr<br>Wayland, MA |         | Address:      | Address: 29 Collins Rd<br>Wilton, NH 03086 |  |
|                                    |         | Telephone No. |  |  |

|                    | 04/26/18 2:41 PM<br>Date Time    | 04/27/18 10:40 AM<br>Date Time   |
|--------------------|----------------------------------|----------------------------------|
|                    |                                  |                                  |
| Observation Hole # | 418-C                            | 418-D                            |
| Depth of Perc      | 44"                              | 58"                              |
| Start Pre-Soak     | 2:41 PM                          | 10:40 AM                         |
| End Pre-Soak       | 2:56 PM                          | 10:57 PM                         |
| Time @ 12"         | 2:56 PM                          | 10:57 PM                         |
| Time @ 9"          | 3:15 PM                          | 11:21 AM                         |
| Time @ 6"          | 3:40 PM                          | 11:51 AM                         |
| Time (9"-6")       | 25                               | 30                               |
| Rate (Min./Inch)   | 9                                | 10                               |
|                    | Test Passed: ☑<br>Test Failed: □ | Test Passed: ☑<br>Test Failed: □ |

Test performed By: Jude Gauvin, GPR

| Witnessed By: | Darren MacCaughney, RS WBOH |  |  |  |  |
|---------------|-----------------------------|--|--|--|--|
|               |                             |  |  |  |  |

Comments:

No. 171053

Date: 8/31/18

# Commonwealth of Massachusetts Wayland Massachusetts

# Soil Suitability Assessment for On-Site Sewage Disposal

| Performed by: Jude Gauvin, GPR                              | 1             | Date: 5/31/18                      |
|---|---------------|------------------------------------|
| Witnessed by: Darren MacCaughney, RS, WBOH                  |               |                                    |
|   |               |                                    |
| Location Address:   | Owner's Name: | Ross Wilkinson                     |
| or Lot No. 57 Shaw Dr                                       | Address:      | 29 Collins Rd                      |
| Wayland, MA   |               | Wilton, NH 03086                   |
|   |               |                                    |
|   | Telephone No. |                                    |
| New Construction 🗹 Upgrade 🗌 Repair                         |               |                                    |
|   |               |                                    |
| Office Review   |               |                                    |
| Published Soil Survey Available:   No   ✓   Yes             |               |                                    |
| Year Published Internet Publication Scale                   | na            | Soil Map Unit 106 C/D              |
| Soil Name Narragansett-Hollis-rock-outcrop Soil Limitations | Depth to      | restrictive features, well drained |
| Soil Name Soil Limitations                                  |               |                                    |
| Soil Name Soil Limitations                                  |               |                                    |
| Surficial Geologic Report Available: No Ves                 |               |                                    |
| Year Published MASS GIS Publication Scale                   |               |                                    |
| Geologic Material(Map Unit) Glacial Till                    |               |                                    |
| Landform Ground Morraine                                    |               |                                    |
|   |               |                                    |
| Flood Insurance Rate Map: 25017C0528F                       |               |                                    |
| Above 500 Year Flood Boundary No Yes                        |               |                                    |
| Within 500 Year Flood Boundary No 🗹 Yes                     |               |                                    |
| Within 100 Year Flood Boundary No 🗹 Yes                     |               |                                    |
| Within Velocity Zone No 🗹 Yes                               |               |                                    |
| Western J. America  |               |                                    |
| Wetland Area:   |               |                                    |
| National wetlands inventory Map (map unit) N/A              |               |                                    |
| wetlands Conservancy Program Map (map unit) N/A             |               |                                    |
| Current Water Resource Conditions (USCS): Month             | Mary          |                                    |
| Range: Above Normal Varmal Varmal Varmal                    |               |                                    |
| Other Deference Deviewed LISCS                              |               |                                    |
|   |               |                                    |
|   |               |                                    |
|   |               |                                    |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:        | 518-1       | Date:    | 05/31/18     | Time:  |          | 8:30 A | М      | Weather:        | Sunny 76° |
|---------------------|-------------|----------|--------------|--------|----------|--------|--------|-----------------|-----------|
| Location (identify  | on site pla | an)      | See Attac    | hed Sk | etch     |        |        |                 |           |
| Land Use Woodl      | and         |          | Slope (%)    | )      | 2%-6%    |        |        | Surfaces Stones | none      |
| (eg woodland, agri  | cultural fi | eld, va  | acant lot et | c)     |          |        |        |                 |           |
| Vegatation mixed    | hardwood    | ls and j | pines        |        |          |        |        |                 |           |
| Landform Ground     | l Morrain   | e        |              |        |          |        |        |                 |           |
| Position on landsca | ape         | See at   | tached Sk    | etch   |          |        |        |                 |           |
| Distances from:     |             |          |              |        |          |        |        |                 |           |
| Open Wa             | ater Body   | >100     | feet         | Drain  | age Way  | >      | 100 fe | et              |           |
| Possible            | Wet Area    | >100     | feet         | Prope  | rty Line | >      | 50 fe  | et              |           |
| Drinking W          | ater Well   | >100     | feet         | Other  |          |        |        |                 |           |
|                     |             |          |              |        |          |        | C.     | - 4             |           |

.....feet

|            | Deep Observation Hole Log |              |            |             |                              |  |  |  |  |  |  |  |
|------------|---------------------------|--------------|------------|-------------|------------------------------|--|--|--|--|--|--|--|
| Hole # 518 | -1                        | NB 30/18     |            |             | Suface El.                   |  |  |  |  |  |  |  |
| Depth from | Soil                      | Soil Texture | Soil Color | Soil        | Other                        |  |  |  |  |  |  |  |
| Surface    | Horizon                   | (USDA)       | (MUNSELL)  | Mottling    | (Stucture, Stones, Boulders, |  |  |  |  |  |  |  |
| (inches)   |                           |              |            |             | Consistency, % Gravel)       |  |  |  |  |  |  |  |
| 0-3        | А                         | sl           | 10YR 3/2   |             | loose, cr, roots             |  |  |  |  |  |  |  |
| 3-30       | В                         | ls           | 10YR 5/6   | mvfr, roots |                              |  |  |  |  |  |  |  |
| 30-92      | C                         | ls           | 10YR 5/4   |             | sabk, 20% gravel, vfirm      |  |  |  |  |  |  |  |
|            |                           |              |            |             |                              |  |  |  |  |  |  |  |
|            |                           |              |            |             |                              |  |  |  |  |  |  |  |
|            |                           |              |            |             |                              |  |  |  |  |  |  |  |
|            |                           |              |            |             |                              |  |  |  |  |  |  |  |
|            |                           |              |            |             |                              |  |  |  |  |  |  |  |
|            |                           |              |            |             |                              |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >92"      |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >92" |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 518-2       | Date:    | 05/31/18      | Time   | :        | 9:00 AM | W        | eather: | Sunny 76° |
|--------------------|-------------|----------|---------------|--------|----------|---------|----------|---------|-----------|
| Location (identify | on site pl  | an)      | See Attacl    | ned Sk | etch     |         | -        |         |           |
| Land Use Wood      | land        |          | Slope (%)     |        | 2%-6%    |         | Surfaces | Stones  | none      |
| (eg woodland, agr  | icultural f | ield, va | acant lot etc | c)     |          |         |          | -       |           |
| Vegatation mixed   | hardwood    | is and   | pines         |        |          |         |          |         |           |
| Landform Groun     | d Morrair   | e        |               |        |          |         |          |         |           |
| Position on landsc | ape         | See a    | tached Ske    | etch   |          |         |          |         |           |
| Distances from:    |             |          |               |        |          |         |          |         |           |
| Open W             | ater Body   | >100     | feet          | Drain  | age Way  | >100    | feet     |         |           |
| Possible           | Wet Area    | >100     | feet          | Prope  | rty Line | >50     | feet     |         |           |
| Drinking W         | ater Well   | >100     | feet          | Other  | :        |         |          |         |           |
|                    |             |          |               |        |          |         | fast     |         |           |

feet

|                                   | Deep Observation Hole Log |                        |                                  |                  |   |  |  |  |  |  |  |
|-----------------------------------|---------------------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|
| Hole # 518                        | -2                        | NB 30/18               |                                  | Suface El.       |   |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |
| 0-3<br>3-30<br>30-99              | A<br>B<br>C               | sl<br>ls<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 |                  | loose, cr, roots<br>mvfr, roots<br>sabk, 20% gravel, vfirm      |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >99"      |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >99" |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:        | 518-3        | Date:   | 05/31/18    | Time:  |          | 10:45 | AM     | Weather:        | Sunny 76° |
|---------------------|--------------|---------|-------------|--------|----------|-------|--------|-----------------|-----------|
| Location (identify  | on site pla  | n)      | See Attacl  | ned Sk | etch     |       |        |                 |           |
| Land Use Woodl      | and          |         | Slope (%)   |        | 2%-6%    |       |        | Surfaces Stones | none      |
| (eg woodland, agri  | cultural fie | eld, va | cant lot et | c)     |          |       |        |                 |           |
| Vegatation mixed    | hardwoods    | s and 1 | pines       |        |          |       |        |                 |           |
| Landform Ground     | d Morraine   | ;       |             |        |          |       |        |                 |           |
| Position on landsca | ape          | See at  | tached Ske  | etch   |          |       |        |                 |           |
| Distances from:     |              |         |             |        |          |       |        |                 |           |
| Open Wa             | ater Body    | >100    | feet        | Draina | age Way  | >     | >100 : | feet            |           |
| Possible            | Wet Area     | >100    | feet        | Prope  | rty Line |       | >50    | feet            |           |
| Drinking W          | ater Well    | >100    | feet        | Other  |          |       |        |                 |           |
|                     | -            |         |             |        |          |       |        | P               |           |

feet

|            | Deep Observation Hole Log |              |            |          |                              |  |  |  |  |  |  |  |
|------------|---------------------------|--------------|------------|----------|------------------------------|--|--|--|--|--|--|--|
| Hole # 518 | -3                        | NB 30/18     |            |          | Suface El.                   |  |  |  |  |  |  |  |
| Depth from | Soil                      | Soil Texture | Soil Color | Soil     | Other                        |  |  |  |  |  |  |  |
| Surface    | Horizon                   | (USDA)       | (MUNSELL)  | Mottling | (Stucture, Stones, Boulders, |  |  |  |  |  |  |  |
| (inches)   |                           |              |            |          | Consistency, % Gravel)       |  |  |  |  |  |  |  |
| 0-3        | А                         | sl           | 10YR 3/2   |          | loose, cr, roots             |  |  |  |  |  |  |  |
| 3-30       | В                         | ls           | 10YR 5/6   |          | mvfr, roots                  |  |  |  |  |  |  |  |
| 30-102     | C                         | ls           | 10YR 5/4   |          | sabk, 20% gravel, vfirm      |  |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |       | Depth to Bedrock: >102"     |
|--|-------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None  | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >102" |                             |
| Aditional Notes                                  |       |                             |
|  |       |                             |
|  |       |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:     | 518-4          | Date:    | 05/31/18     | Time:  |          | 12:00 | PM   |      | ν        | Veather | r: | Sunny 76° |
|------------------|----------------|----------|--------------|--------|----------|-------|------|------|----------|---------|----|-----------|
| Location (ident  | ify on site pl | lan)     | See Attack   | hed Sk | etch     |       |      |      |          |         |    |           |
| Land Use Wo      | odland         | W        | Slope (%)    |        | 2%-6%    |       |      | S    | Surfaces | s Stone | es | none      |
| (eg woodland, a  | gricultural f  | ield, va | acant lot et | c)     |          |       |      |      |          |         |    |           |
| Vegatation mix   | ed hardwood    | ds and   | pines        |        |          |       |      |      |          |         |    |           |
| Landform Gro     | und Morrair    | ne       |              |        |          |       |      |      |          |         |    |           |
| Position on land | lscape         | See a    | ttached Ske  | etch   |          |       |      |      |          |         |    |           |
| Distances from:  |                |          |              |        |          |       |      |      |          |         |    |           |
| Open             | Water Body     | / >100   | feet         | Drain  | age Way  |       | >100 | feet |          |         |    |           |
| Possil           | le Wet Area    | a >100   | feet         | Prope  | rty Line |       | >50  | feet |          |         |    |           |
| Drinking         | Water Well     | >100     | feet         | Other  |          |       |      |      |          |         |    |           |
|                  |                |          |              |        |          |       |      | C I  |          |         |    |           |

\_\_\_\_\_feet

|            | Deep Observation Hole Log |              |            |          |                              |  |  |  |  |  |  |
|------------|---------------------------|--------------|------------|----------|------------------------------|--|--|--|--|--|--|
| Hole # 518 | -4                        | NB 30/20     |            |          | Suface El.                   |  |  |  |  |  |  |
| Depth from | Soil                      | Soil Texture | Soil Color | Soil     | Other                        |  |  |  |  |  |  |
| Surface    | Horizon                   | (USDA)       | (MUNSELL)  | Mottling | (Stucture, Stones, Boulders, |  |  |  |  |  |  |
| (inches)   |                           |              |            |          | Consistency, % Gravel)       |  |  |  |  |  |  |
| 0-3        | А                         | sl           | 10YR 3/2   |          | loose, cr, roots             |  |  |  |  |  |  |
| 3-36       | В                         | ls           | 10YR 5/6   |          | mvfr, roots                  |  |  |  |  |  |  |
| 36-108     | С                         | ls           | 10YR 5/4   |          | sabk, 20% gravel, vfirm      |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |
|            |                           |              |            |          |                              |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |       | Depth to Bedrock: >108"     |
|--|-------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None  | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >108" |                             |
| Aditional Notes                                  |       |                             |
|  |       |                             |
|  |       |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:      | 518-5        | Date:         | 05/31/18 Time  | e:        | 2:15 PM | Weather:        | Sunny 76° |
|-------------------|--------------|---------------|----------------|-----------|---------|-----------------|-----------|
| Location (identif | y on site pl | an)           | See Attached S | ketch     |         |                 |           |
| Land Use Woo      | dland        |               | Slope (%)      | 2%        |         | Surfaces Stones | none      |
| (eg woodland, ag  | ricultural f | ield, va      | cant lot etc)  |           |         | i.              |           |
| Vegatation mixe   | d hardwood   | ds and j      | pines          |           |         |                 |           |
| Landform Grou     | nd Morrair   | ne            |                |           |         |                 |           |
| Position on lands | scape        | See at        | tached Sketch  |           |         |                 |           |
| Distances from:   |              |               |                |           |         |                 |           |
| Open V            | Water Body   | <i>v</i> >100 | feet Drai      | nage Way  | >100    | feet            |           |
| Possibl           | e Wet Area   | >100          | feet Prop      | erty Line | >50     | feet            |           |
| Drinking          | Water Well   | >100          | feet Othe      | r:        |         |                 |           |
|                   |              |               |                |           |         | feet            |           |
|                   |              |               |                |           |         |                 |           |

| Deep Observation Hole Log |         |              |            |          |                              |  |  |  |  |  |  |
|---------------------------|---------|--------------|------------|----------|------------------------------|--|--|--|--|--|--|
| Hole # 518                | -5      | NB 30/20     |            |          | Suface El.                   |  |  |  |  |  |  |
| Depth from                | Soil    | Soil Texture | Soil Color | Soil     | Other                        |  |  |  |  |  |  |
| Surface                   | Horizon | (USDA)       | (MUNSELL)  | Mottling | (Stucture, Stones, Boulders, |  |  |  |  |  |  |
| (inches)                  |         |              |            |          | Consistency, % Gravel)       |  |  |  |  |  |  |
| 0-3                       | А       | sl           | 10YR 3/2   |          | loose, cr, roots             |  |  |  |  |  |  |
| 3-20                      | В       | ls           | 10YR 5/6   |          | roots, mfr, abk              |  |  |  |  |  |  |
| 20-62                     | C1      | fs           | 10YR 6/1   |          | loose, roots                 |  |  |  |  |  |  |
| 62-100                    | C2      | ls           | 10YR 5/4   | @66"     | sabk, 20% gravel, vfirm      |  |  |  |  |  |  |
|                           |         |              |            |          |                              |  |  |  |  |  |  |
|                           |         |              |            |          |                              |  |  |  |  |  |  |
|                           |         |              |            |          |                              |  |  |  |  |  |  |
|                           |         |              |            |          |                              |  |  |  |  |  |  |
|                           |         |              |            |          |                              |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >100"     |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | 66"  |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

#### Location Address or Lot#: 57 Shaw Dr Wayland, MA

# **Determination for Seasonal High Water Table**

#### Method Used:

|              | Depth observed standing in observation hole inches   Depth weeping from side of observation hole inches   Depth to soil mottles * inches   Ground water adjustment feet  |
|--------------|--|
| Index Wel    | l Number Reading Date Index Well Level   |
| Adjustmer    | Adjusted Ground Water Level  |
| Depth of N   | Naturally Occuring Pervious Material   |
|              | Does at least four feet of naturally occuring pervious material exist in all areas observed throughout the area proposed for the soil absorption system? Yes   |
|              | If not, what is the depth of naturally occuring pervious material? Feet  |
| Certificatio | on   |
| Notes:       | I certify that I am currently approved by the Department of Environmental Protection<br>pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis<br>has been performed by me consistent with the training, expertise and experience described<br>in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated,<br>on the attached soil evaluation form, are accurate and in accordance with 310 CMR<br>15.100 through 15.107<br>Signature Mathematical Date $\frac{3}{3}$ |
| 110100.      |  |

# FORM 12 - PERCOLATION TEST

| Location Address: |                           | Owner's Name: | Ross Wilkinson                    |  |
|-------------------|---------------------------|---------------|-----------------------------------|--|
| or Lot #          | 57 Shaw Dr<br>Wayland, MA | Address:      | 29 Collins Rd<br>Wilton, NH 03086 |  |
|                   |                           | Telephone No. |                                   |  |

|                    | 5/31/18 12:51 PM | 5/31/18 12:58 PM |
|--------------------|------------------|------------------|
|                    | Date Time        | Date Time        |
|                    |                  |                  |
| Observation Hole # | 518-A            | 518-B            |
| Depth of Perc      | 53"              | 46"              |
| Start Pre-Soak     | 12:51 PM         | 12:52 PM         |
| End Pre-Soak       | 1:06 PM          | 1:07 PM          |
| Time @ 12"         | 1:06 PM          | 1:07 PM          |
| Time @ 9"          | 1:11 PM          | 1:12 PM          |
| Time @ 6"          | 1:23 PM          | 1:19 PM          |
| Time (9"-6")       | 12               | 7                |
| Rate (Min./Inch)   | 4                | 3                |
|                    |                  |                  |
|                    | Test Passed:     | Test Passed: 🗹   |
|                    | Test Failed:     | Test Failed: 🗖   |

Test performed By: Jude Gauvin, GPR

| Witnessed By: | Darren MacCaughney, RS WBOH |  |
|---------------|-----------------------------|--|
| Comments:     |                             |  |

No. 171053

Date: 6/17/19

## Commonwealth of Massachusetts Wayland Massachusetts

# Soil Suitability Assessment for On-Site Sewage Disposal

| Performed by: Jude Gauvin, GPR                              | Date: 6/12/19.                              |
|---|---|
| Witnessed by: Darren MacCaughney, RS, WBOH                  |   |
|   |   |
| Location Address:   | Owner's Name: Ross Wilkinson                |
| or Lot No. 57 Shaw Dr                                       | Address: 29 Collins Rd                      |
| Wayland, MA   | Wilton, NH 03086                            |
| •   | <i>,</i>                                    |
|   | Telephone No.                               |
| New Construction 🗹 Upgrade 🔲 Repair                         |   |
| ··· – ·   |   |
| Office Review   |   |
| Published Soil Survey Available: No 🗹 Yes                   |   |
| Year Published Internet Publication Scale                   | na Soil Map Unit 106 C/D                    |
| Soil Name Narragansett-Hollis-rock-outcrop Soil Limitations | Depth to restrictive features, well drained |
| Soil Name Soil Limitations                                  |   |
| Soil Name Soil Limitations                                  |   |
| Surficial Geologic Report Available: No 🔽 Yes               |   |
| Year Published MASS GIS Publication Scale                   |   |
| Geologic Material(Map Unit) Glacial Till                    |   |
| Landform Ground Morraine                                    |   |
|   |   |
| Flood Insurance Rate Map: 25017C0528F                       |   |
| Above 500 Year Flood Boundary No 🛛 Yes                      |   |
| Within 500 Year Flood Boundary No 🗹 Yes                     |   |
| Within 100 Year Flood Boundary No 🗹 Yes                     |   |
| Within Velocity ZoneNoImage: Yes                            |   |
|   |   |
| Wetland Area:   |   |
| National Wetlands Inventory Map (map unit) N/A              |   |
| Wetlands Conservancy Program Map (map unit) N/A             |   |
|   |   |
| Current Water Resource Conditions (USGS): Month             | June  |
| Range: Above Normal 🔲 Normal 🗹 Below Norm                   | nal   |
| Other Reference Reviewed USGS                               |   |
|   |   |
|   |   |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #: 619-1 Dat            | e: 06/12/19 Time | e: 9:00 AM   | Weather:        | Sunny 70°                               |
|-----------------------------------|------------------|--------------|-----------------|---|
| Location (identify on site plan)  | See Attached S   | ketch        |                 | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| Land Use Woodland                 | Slope (%)        | 2%-6%        | Surfaces Stones | none                                    |
| (eg woodland, agricultural field, | vacant lot etc)  |              |                 |   |
| Vegatation mixed hardwoods an     | d pines          |              |                 |   |
| Landform Ground Morraine          |                  |              |                 |   |
| Position on landscape See         | attached Sketch  | *******      |                 |   |
| Distances from:                   |                  |              |                 |   |
| Open Water Body >10               | 0 feet Drai      | nage Way >10 | 0 feet          |   |
| Possible Wet Area >10             | 0 feet Prop      | erty Line >5 | 0 feet          |   |
| Drinking Water Well >10           | 0 feet Othe      | er:          |                 |   |
|                                   |                  |              | feet            |   |

|  |   |   |   |  |   |  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | Tee |  |
|--|---|---|---|--|---|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|--|
|  | - | - | - |  | • |  |  | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |     |  |

| Deep Observation Hole Log         |                 |                        |                                  |                  |   |  |  |  |  |  |  |  |
|-----------------------------------|-----------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|--|
| Hole # 619                        | -1              | NB 30/108              |                                  | Suface El.       |   |  |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |  |
| 0-4<br>4-31<br>31-83              | A<br>B<br>C     | sl<br>sl<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 |                  | loose, cr, roots<br>mvfr, roots<br>sabk, 10% gravel, mvfr       |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >83"      |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >83" |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #: 619-2 Date             | : 06/12/19 Tin | ie: 9:     | 30 AM | Weather:        | Sunny 70° |
|-------------------------------------|----------------|------------|-------|-----------------|-----------|
| Location (identify on site plan)    | See Attached   | Sketch     |       |                 |           |
| Land Use Woodland                   | Slope (%)      | 2%-6%      |       | Surfaces Stones | none      |
| (eg woodland, agricultural field, v | acant lot etc) |            |       |                 |           |
| Vegatation mixed hardwoods and      | pines          |            |       |                 |           |
| Landform Ground Morraine            |                |            |       |                 |           |
| Position on landscape See a         | ttached Sketch |            |       |                 |           |
| Distances from:                     |                |            |       |                 |           |
| Open Water Body >100                | feet Dra       | inage Way  | >100  | feet            |           |
| Possible Wet Area >100              | feet Pro       | perty Line | >50   | feet            |           |
| Drinking Water Well >100            | feet Oth       | er:        |       |                 |           |
| *                                   | -              |            |       | feet            |           |

|  |  |  |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   | 104 |  |
|--|--|--|---|---|---|---|---|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|--|
|  |  |  | - | • | • | - | - | • • | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |     |  |
|  |  |  |   |   |   |   |   |     |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |  |

|                                   | Deep Observation Hole Log |                        |                                  |                  |   |  |  |  |  |  |  |  |  |  |
|-----------------------------------|---------------------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|--|--|--|
| Hole # 619                        | -2                        | NB 30/108              |                                  |                  | Suface El.  |  |  |  |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |  |  |  |
| 0-4<br>4-30<br>30-82              | A<br>B<br>C               | sl<br>sl<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 |                  | loose, cr, roots<br>mvfr, roots<br>sabk, 10% gravel, mvfr       |  |  |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >82"      |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >82" |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## <u>On-Site Review</u>

| Deep Hole #: 619-3 Date             | : 06/12/19 Time: | 10:00 AM       | Weather:        | Sunny 70° |
|-------------------------------------|------------------|----------------|-----------------|-----------|
| Location (identify on site plan)    | See Attached Ske | tch            | ••              |           |
| Land Use Woodland                   | Slope (%)        | 2%-6%          | Surfaces Stones | none      |
| (eg woodland, agricultural field, v | acant lot etc)   |                |                 |           |
| Vegatation mixed hardwoods and      | pines            |                |                 |           |
| Landform Ground Morraine            |                  |                |                 |           |
| Position on landscape See a         | ttached Sketch   |                |                 |           |
| Distances from:                     |                  |                |                 |           |
| Open Water Body >100                | feet Draina      | ge Way >100 fe | et              |           |
| Possible Wet Area >100              | feet Propert     | ty Line >50 fe | et              |           |
| Drinking Water Well >100            | feet Other:      |                |                 |           |

feet

|                                   | Deep Observation Hole Log |                        |                                  |                  |   |  |  |  |  |  |  |  |  |
|-----------------------------------|---------------------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|--|--|
| Hole # 619                        | -3                        | NB 30/110              |                                  |                  | Suface El.  |  |  |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |  |  |
| 0-4<br>4-26<br>26-120             | A<br>B<br>C               | sl<br>sl<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 |                  | loose, cr, roots<br>mvfr, roots<br>sabk, 10% gravel, mvfr       |  |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |       | Depth to Bedrock: >120" |      |
|--|-------|-------------------------|------|
| Depth to Groundwater: Standing Water in the Hole | None  | Weeping from Pit Face:  | None |
| Estimated Seasonal High Groundwater in the Hole  | >120" |                         |      |
| Aditional Notes                                  |       |                         |      |
|  |       |                         |      |
|  |       |                         |      |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## <u>On-Site Review</u>

| Deep Hole #: 619-4         | Date: 06/12/       | 19 Time:      | 10:30 AM | Weather:        | Sunny 70° |
|----------------------------|--------------------|---------------|----------|-----------------|-----------|
| Location (identify on site | plan) See At       | tached Sketch |          |                 |           |
| Land Use Woodland          | Slope (            | (%) 2%-6      | %        | Surfaces Stones | none      |
| (eg woodland, agricultura  | l field, vacant lo | t etc)        |          |                 |           |
| Vegatation mixed hardwo    | ods and pines      |               |          |                 |           |
| Landform Ground Morra      | aine               |               | -        |                 |           |
| Position on landscape      | See attached       | Sketch        |          |                 |           |
| Distances from:            |                    |               |          |                 |           |
| Open Water Bo              | dy >100 feet       | Drainage W    | /ay >100 | feet            |           |
| Possible Wet A             | rea >100 feet      | Property Li   | ne >50   | feet            |           |
| Drinking Water W           | ell >100 feet      | Other:        |          |                 |           |
|                            |                    |               |          | •               |           |

|       |      |       |   |   |   |   |   |   |   |   |   |  |   |   |   |  |   |  |   |   | feet |
|-------|------|-------|---|---|---|---|---|---|---|---|---|--|---|---|---|--|---|--|---|---|------|
| <br>- | <br> | <br>- | - | - | - | - | - | - | - | - | - |  | - | - | - |  | - |  | - | - |      |

|                                   | Deep Observation Hole Log |                        |                                  |                  |   |  |  |  |  |  |  |  |  |
|-----------------------------------|---------------------------|------------------------|----------------------------------|------------------|---|--|--|--|--|--|--|--|--|
| Hole # 619                        | -4                        | NB 30/110              |                                  | Suface El.       |   |  |  |  |  |  |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |  |  |  |  |  |
| 0-4<br>4-25<br>25- <b>8</b> 5     | A<br>B<br>C               | sl<br>sl<br>ls         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 |                  | loose, cr, roots<br>mvfr, roots<br>sabk, 10% gravel, mvfr       |  |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >85"      |  |  |  |  |  |
|--|------|-----------------------------|--|--|--|--|--|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |  |  |  |  |  |
| Estimated Seasonal High Groundwater in the Hole  | >85" |                             |  |  |  |  |  |
| Aditional Notes                                  |      |                             |  |  |  |  |  |
|  |      |                             |  |  |  |  |  |
|  |      |                             |  |  |  |  |  |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #:       | 619-5        | Date:    | 06/12/19     | Time:  |          | 11:00 A | M       | •     | Weather    | r: S | Sunny 70° |
|--------------------|--------------|----------|--------------|--------|----------|---------|---------|-------|------------|------|-----------|
| Location (identify | on site pla  | an)      | See Attach   | ied Sk | etch     |         |         |       |            |      |           |
| Land Use Wood      | land         |          | Slope (%)    |        | 2%-6%    |         |         | Surfa | ices Stone | s    | none      |
| (eg woodland, agr  | icultural fi | eld, va  | cant lot etc | s)     |          |         |         |       |            |      |           |
| Vegatation mixed   | hardwood     | ls and j | pines        |        |          |         |         |       |            |      |           |
| Landform Groun     | d Morrain    | e        |              |        |          |         |         |       |            |      |           |
| Position on landso | ape          | See at   | ttached Ske  | etch   |          |         |         |       |            |      |           |
| Distances from:    |              |          |              |        |          |         |         |       |            |      |           |
| Open W             | ater Body    | >100     | feet         | Drain  | age Way  | >       | 100 fee | et    |            |      |           |
| Possible           | Wet Area     | >100     | feet         | Prope  | rty Line |         | >50 fee | et    |            |      |           |
| Drinking W         | Vater Well   | >100     | feet         | Other  | :        | •••     |         |       |            |      |           |
|                    |              |          |              |        |          |         | c       |       |            |      |           |

feet

|            | Deep Observation Hole Log |              |            |                  |                                    |  |  |  |  |  |  |  |  |
|------------|---------------------------|--------------|------------|------------------|------------------------------------|--|--|--|--|--|--|--|--|
| Hole # 619 | -5                        |              | Suface El. |                  |                                    |  |  |  |  |  |  |  |  |
| Depth from | Soil<br>Horizon           | Soil Texture | Soil Color | Soil<br>Mottling | Other<br>(Stuature Stenes Boulders |  |  |  |  |  |  |  |  |
| (inches)   | TIONZON                   | (USDA)       | (MONSELL)  | Woumig           | Consistency, % Gravel)             |  |  |  |  |  |  |  |  |
| 0-4        | A                         | sl           | 10YR 3/2   |                  | loose, cr, roots                   |  |  |  |  |  |  |  |  |
| 4-26       | В                         | sl           | 10YR 5/6   |                  | mvfr, roots                        |  |  |  |  |  |  |  |  |
| 26-90      | С                         | ls           | 10YR 5/4   |                  | sabk, 10% gravel, mvfr             |  |  |  |  |  |  |  |  |
|            |                           |              |            |                  |                                    |  |  |  |  |  |  |  |  |
|            |                           |              |            |                  |                                    |  |  |  |  |  |  |  |  |
|            |                           |              |            |                  |                                    |  |  |  |  |  |  |  |  |
|            |                           |              |            |                  |                                    |  |  |  |  |  |  |  |  |
| ·          |                           | L            |            |                  |                                    |  |  |  |  |  |  |  |  |

| Parent Material (geologic) Glacial Till          |                 | Depth to Bedrock: >90"      |
|--|-----------------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None            | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >90"            |                             |
| Aditional Notes B horizon had p                  | ockets of fls 2 | 2.5Y 7/3                    |
|  | *******         |                             |
|  |                 |                             |

Location Address or Lot #: 57 Shaw Dr Wayland, MA

## **On-Site Review**

| Deep Hole #: 619-6 Date             | 06/12/19 Time   | : 11:30 AM      | Weather:        | Sunny 70° |
|-------------------------------------|-----------------|-----------------|-----------------|-----------|
| Location (identify on site plan)    | See Attached Sk | ketch           |                 |           |
| Land Use Woodland                   | Slope (%)       | 2%-6%           | Surfaces Stones | none      |
| (eg woodland, agricultural field, v | acant lot etc)  |                 |                 |           |
| Vegatation mixed hardwoods and      | pines           |                 |                 |           |
| Landform Ground Morraine            |                 |                 |                 |           |
| Position on landscape See a         | ttached Sketch  |                 |                 |           |
| Distances from:                     |                 |                 |                 |           |
| Open Water Body >100                | feet Drain      | nage Way >100 : | feet            |           |
| Possible Wet Area >100              | feet Prope      | erty Line >50   | feet            |           |
| Drinking Water Well >100            | feet Other      | r:              |                 |           |
|                                     | •               |                 | feet            |           |

|  |   |   |   |   |   |   |   |   |   |   |   |   |   |  |   |   |   |   |  |   |   |  |   |  |       | I | C | 1 |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|---|---|--|---|---|--|---|--|-------|---|---|---|
|  | - | - | - | - | - | - | - | - | - | - | - | - | - |  | - | - | • | - |  | - | - |  | - |  | <br>- |   |   |   |

|                                   | Deep Observation Hole Log |                        |                                  |                  |   |  |  |  |
|-----------------------------------|---------------------------|------------------------|----------------------------------|------------------|---|--|--|--|
| Hole # 619                        | -6                        | NB 30/111              | · · · · =                        | Suface El.       |   |  |  |  |
| Depth from<br>Surface<br>(inches) | Soil<br>Horizon           | Soil Texture<br>(USDA) | Soil Color<br>(MUNSELL)          | Soil<br>Mottling | Other<br>(Stucture, Stones, Boulders,<br>Consistency, % Gravel) |  |  |  |
| 0-4<br>4-30<br>30-90              | A<br>B<br>C               | sl<br>Is<br>Is         | 10YR 3/2<br>10YR 5/6<br>10YR 5/4 |                  | loose, cr, roots<br>mvfr, roots<br>sabk, 10% gravel, mvfr       |  |  |  |

| Parent Material (geologic) Glacial Till          |      | Depth to Bedrock: >90"      |
|--|------|-----------------------------|
| Depth to Groundwater: Standing Water in the Hole | None | Weeping from Pit Face: None |
| Estimated Seasonal High Groundwater in the Hole  | >90" |                             |
| Aditional Notes                                  |      |                             |
|  |      |                             |
|  |      |                             |

Location Address or Lot#: 57 Shaw Dr Wayland, MA

## **Determination for Seasonal High Water Table**

#### Method Used:

|            | Depth observed standing    | in observation h | hole inches                             |   |
|------------|----------------------------|------------------|---|---|
|            | Depth weeping from side    | of observation   | hole inches                             |   |
|            | Depth to soil mottles      | * inches         | See individual Reports                  |   |
|            | Ground water adjustment    | feet             |   |   |
| Index Wel  | l Number                   | Reading Date     | Index Well Level                        |   |
| Adjustmen  | t Factor                   | Adjusted Grou    | nd Water Level                          |   |
| Depth of N | laturally Occuring Perviou | s Material       |   |   |
|            | Does at least four feet of | naturally occuri | ng pervious material exist in all areas | ŝ |

observed throughout the area proposed for the soil absorption system? Yes

If not, what is the depth of naturally occuring pervious material?

#### **Certification**

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated, on the attached soil evaluation form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

| Signature | Allehan | Date | 6/17/19 |  |
|-----------|---------|------|---------|--|
| Notes:    | ·       |      | ·       |  |

Signature

.

## FORM 12 - PERCOLATION TEST

| Location Add<br>or Lot # | dress:<br>57 Shaw Dr<br>Wayland, MA | Owner's Name:<br>Address: | Ross Wilkinson<br>29 Collins Rd<br>Wilton, NH 03086 |  |
|--------------------------|-------------------------------------|---------------------------|---|--|
|                          |                                     | Telephone No.             |   |  |

|                    | 6/12/19 12:35 PM | 6 | /12/19 12:36  | PM |
|--------------------|------------------|---|---------------|----|
|                    | Date Time        | Ē | Date Time     |    |
|                    |                  |   |               |    |
| Observation Hole # | 619-A            |   | 619-B         |    |
| Depth of Perc      | 52"              |   | 52"           |    |
| Start Pre-Soak     | 12:35 PM         | _ | 12:36 PM      |    |
| End Pre-Soak       | 12:50 PM         | _ | 12:51 PM      |    |
| Time @ 12"         | 12:50 PM         | — | 12:51 PM      |    |
| Time @ 9"          | 12:53 PM         |   | 1:39 PM       |    |
| Time @ 6"          | 12:58 PM         | _ | 2:32 PM       |    |
| Time (9"-6")       | 5                | _ | 53            |    |
| Rate (Min./Inch)   | <2               |   | 18            |    |
|                    | Test Passed:     | Т | est Passed: 🗹 |    |
|                    | Test Failed:     | Т | est Failed: 🗖 |    |

Test performed By: Jude Gauvin, GPR

| Witnessed By: | Darren MacCaughney, RS WBOH |  |
|---------------|-----------------------------|--|
|---------------|-----------------------------|--|

Comments:

\* over 24 gallons applied unable to soak

,

# National Flood Hazard Layer FIRMette

S FEMA

71°21'25"W 42°20'50"N



0

| Legend   |  |  |
|--|--|--|
| SEE FIS REPORT FOR D   | ETAILED LEGI   | END AND INDEX MAP FOR FIRM PANEL LAYOUT  |
| SPECIAL FLOOD<br>HAZARD AREAS  |  | Without Base Flood Elevation (BFE)<br>Zone A, V, A99<br>With BFE or Depth Zone AE, A0, AH, VE, AR<br>Regulatory Floodway   |
| OTHER AREAS OF   |  | 0.2% Annual Chance Flood Hazard. Areas<br>of 1% annual chance flood with average<br>depth less than one foot or with drainage<br>areas of less than one square mile <i>Zone X</i><br>Future Conditions 1% Annual<br>Chance Flood Hazard <i>Zone X</i><br>Area with Reduced Flood Risk due to<br>Levee. See Nores. <i>Zone X</i><br>Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS  | NO SCREEN  | Area of Minimal Flood Hazard Zone X<br>Effective LOMRs<br>Area of Undetermined Flood Hazard Zone D   |
| GENERAL<br>STRUCTURES  |  | Channel, Culivert, or Storm Sewer<br>Levee, Dike, or Floodwall   |
| OTHER  | B 20.2<br>17.5<br>(a)<br>(b)<br>(b)<br>(c)<br>(c)<br>(c)   | Cross Sections with 1% Annual Chance<br>Water Surface Elevation<br>Coastal Transect<br>Base Flood Elevation Line (BFE)<br>Limit of Study<br>Jurisdiction Boundary<br>Coastal Transect Baseline<br>Profile Baseline<br>Hydrographic Feature   |
|  | The piran aut  | Digital Data Available No Digital Data Available Unmapped on the map is an approximate elected by the user and does not represent noritative property location.  |
| This map com<br>digital flood m<br>The basemap<br>accuracy stant<br>The flood haza<br>authoritative N<br>was exported<br>reflect change<br>time. The NFH | plies with F<br>aps if it is t<br>shown corr<br>dards<br>ard informa<br>VFHL web s<br>on 6/22/20<br>s or amend<br>L and effec<br>seeded by n | EMA's standards for the use of<br>ot void as described below.<br>plies with FEMA's basemap<br>tion is derived directly from the<br>ervices provided by FEMA. This map<br>220 at 3.53 PM and does not<br>iments subsequent to this date and<br>tive information may change or<br>ew data over time.   |
| This map imag<br>elements do n<br>legend, scale l<br>FIRM panel nu<br>unmapped and<br>regulatory pur   | ge is void if<br>ot appear:<br>bar, map cr<br>imber, and<br>d unmoderi<br>poses.   | the one or more of the following map<br>basemap imagery, flood zone labels,<br>eation date, community identifiers,<br>FIRM effective date. Map images for<br>nized areas cannot be used for  |



| AP3   |                                   |
|---|-----------------------------------|
| WATERSHED<br>EXISTING CON<br>FIVE PATH          | MAP<br>DITIONS                    |
| ASSESSORS MAP#39<br>WAYLAND,<br>PROJECT: 171053 | PARCEL 15A<br>MA<br><u>1 of 1</u> |



#### Pre-Dev Prepared by Goldsmith, Prest & Ringwall, Inc. HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLC

Printed 6/23/2020 Page 2

## Area Listing (all nodes)

| Area    | CN | Description  |
|---------|----|--|
| (sq-ft) |    | (subcatchment-numbers)                                   |
| 63,276  | 74 | >75% Grass cover, Good, HSG C (SC1.0, SC3.0)             |
| 7,450   | 98 | Paved parking, HSG C (SC1.0, SC3.0)                      |
| 3,874   | 98 | Roofs, HSG C (SC1.0, SC3.0)                              |
| 16,501  | 98 | Unconnected pavement, HSG C (SC1.0, SC2.0, SC3.0, SC4.0) |
| 387,184 | 70 | Woods, Good, HSG C (SC1.0, SC2.0, SC3.0, SC4.0)          |
| 478,286 | 72 | TOTAL AREA   |

|  | Five Paths, Wayland MA Project No. 171053 |
|--|---|
| Pre-Dev  | NRCC 24-hr D 0.5 Inch Rainfall=0.50"      |
| Prepared by Goldsmith, Prest & Ringwall, Inc.            | Printed 6/23/2020                         |
| HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software So | olutions LLC Page 3                       |

Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.0: | Runoff Area=215,046 sf 4.94% Impervious<br>Flow Length=646' Tc=6.7 min CN=72             | Runoff Depth=0.00"<br>Runoff=0.0 cfs 0 cf   |
|--------------------|--|---|
| SubcatchmentSC2.0: | Runoff Area=53,073 sf 16.30% Impervious<br>Flow Length=190' Tc=7.2 min UI Adjusted CN=72 | Runoff Depth=0.00"<br>Runoff=0.0 cfs 0 cf   |
| SubcatchmentSC3.0: | Runoff Area=195,127 sf 1.28% Impervious<br>Flow Length=642' Tc=12.6 min CN=71            | Runoff Depth=0.00"<br>Runoff=0.0 cfs 0 cf   |
| SubcatchmentSC4.0: | Runoff Area=15,041 sf   40.25% Impervious<br>Flow Length=98'   Tc=6.8 min   CN=81        | Runoff Depth>0.00"<br>Runoff=0.0 cfs 0 cf   |
| Link AP1:          |  | Inflow=0.0 cfs 0 cf<br>Primary=0.0 cfs 0 cf |
| Link AP2:          |  | Inflow=0.0 cfs 0 cf<br>Primary=0.0 cfs 0 cf |
| Link AP3:          |  | Inflow=0.0 cfs 0 cf<br>Primary=0.0 cfs 0 cf |
| Link AP4:          |  | Inflow=0.0 cfs 0 cf<br>Primary=0.0 cfs 0 cf |

Total Runoff Area = 478,286 sf Runoff Volume = 0 cf Average Runoff Depth = 0.00"94.18% Pervious = 450,461 sf5.82% Impervious = 27,826 sf

Five Paths, Wayland MA Project No. 171053 **Pre-Dev** NRCC 24-hr D 0.5 Inch Rainfall=0.50" Printed 6/23/2020 Prepared by Goldsmith, Prest & Ringwall, Inc. HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLC Page 4

#### Summary for Subcatchment SC1.0:

Runoff 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00" =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| A     | Area (sf) | CN [        | Description           |              |  |  |  |  |  |
|-------|-----------|-------------|-----------------------|--------------|--|--|--|--|--|
|       | 165,508   | 70 \        | 70 Woods, Good, HSG C |              |  |  |  |  |  |
|       | 38,916    | 74 >        | •75% Gras             | s cover, Go  | bod, HSG C                             |  |  |  |  |
|       | 778       | 98 l        | Jnconnecte            | ed pavemer   | nt, HSG C                              |  |  |  |  |
|       | 7,395     | 98 F        | Paved park            | ing, HSG C   |  |  |  |  |  |
|       | 2,449     | <u>98</u> F | Roofs, HSC            | i C          |  |  |  |  |  |
|       | 215,046   | 72 \        | Veighted A            | verage       |  |  |  |  |  |
| :     | 204,424   | ę           | 95.06% Per            | vious Area   |  |  |  |  |  |
|       | 10,622    | 2           | l.94% Impe            | ervious Area | а                                      |  |  |  |  |
|       | 778       | 7           | 7.32% Unco            | onnected     |  |  |  |  |  |
| т.    | 1         | 0           | M. L                  | 0            | Description                            |  |  |  |  |
|       | Length    | Siope       | Velocity              | Capacity     | Description                            |  |  |  |  |
| (min) | (teet)    | (π/π)       | (IT/Sec)              | (CIS)        |  |  |  |  |  |
| 0.7   | 50        | 0.0200      | 1.19                  |              | Sheet Flow,                            |  |  |  |  |
|       |           |             |                       |              | Smooth surfaces $n = 0.011 P2 = 3.16"$ |  |  |  |  |
| 0.2   | 32        | 0.0200      | 2.87                  |              | Shallow Concentrated Flow,             |  |  |  |  |
|       |           |             | 4.00                  |              | Paved Kv= 20.3 fps                     |  |  |  |  |
| 5.8   | 564       | 0.1046      | 1.62                  |              | Shallow Concentrated Flow,             |  |  |  |  |
|       |           |             |                       |              | Woodland Kv= 5.0 fps                   |  |  |  |  |
| 6.7   | 646       | Total       |                       |              |  |  |  |  |  |
|       |           |             |                       |              |  |  |  |  |  |

#### Summary for Subcatchment SC2.0:

| Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.0 | Runoff = | 0.0 cfs @ 0 | 0.00 hrs, Volume= | 0 cf, Depth= 0.00" |
|---|----------|-------------|-------------------|--------------------|
|---|----------|-------------|-------------------|--------------------|

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

|             | Area (sf)                          | CN /             | Adj Desc                           | ription  |  |
|-------------|------------------------------------|------------------|------------------------------------|--|--|
|             | 8,651<br>44 422                    | 98<br>70         | Unco                               | onnected pa                                      | avement, HSG C<br>HSG C  |
|             | 53,073<br>44,422<br>8,651<br>8,651 | 75               | 72 Weig<br>83.7(<br>16.3(<br>100.0 | hted Avera<br>% Perviou<br>% Impervi<br>0% Uncor | age, UI Adjusted<br>is Area<br>ous Area<br>inected   |
| Tc<br>(min) | Length                             | Slope<br>(ft/ft) | Velocity<br>(ft/sec)               | Capacity<br>(cfs)                                | Description  |
| 6.1         | 50                                 | 0.1200           | 0.14                               |  | Sheet Flow,  |
| 1.1         | 140                                | 0.1714           | 2.07                               |  | Woods: Light underbrush n= 0.400 P2= 3.16"<br>Shallow Concentrated Flow,<br>Woodland Kv= 5.0 fps |
| 72          | 190                                | Total            |                                    |  |  |

1.2 190 I otal Five Paths, Wayland MA Project No. 171053Pre-DevNRCC 24-hr D0.5 Inch Rainfall=0.50"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 5

#### Summary for Subcatchment SC3.0:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

|      | Area (sf) | CN      | Description |             |                                 |
|------|-----------|---------|-------------|-------------|---------------------------------|
|      | 168,267   | 70      | Woods, Go   | od, HSG C   |                                 |
|      | 24,360    | 74      | >75% Gras   | s cover, Go | ood, HSG C                      |
|      | 55        | 98      | Paved park  | ing, HSG C  |                                 |
|      | 1,425     | 98      | Roofs, HSG  | G C         |                                 |
|      | 1,019     | 98      | Unconnecte  | ed pavemer  | nt, HSG C                       |
|      | 195,127   | 71      | Weighted A  | verage      |                                 |
|      | 192,627   |         | 98.72% Per  | vious Area  |                                 |
|      | 2,499     |         | 1.28% Impe  | ervious Are | a                               |
|      | 1,019     |         | 40.77% Un   | connected   |                                 |
|      |           |         |             |             |                                 |
| Тс   | c Length  | Slope   | e Velocity  | Capacity    | Description                     |
| (min | ) (feet)  | (ft/ft) | ) (ft/sec)  | (cfs)       |                                 |
| 5.7  | 7 50      | 0.0200  | 0.15        |             | Sheet Flow,                     |
|      |           |         |             |             | Grass: Short n= 0.150 P2= 3.16" |
| 1.9  | 225       | 0.0800  | ) 1.98      |             | Shallow Concentrated Flow,      |
|      |           |         |             |             | Short Grass Pasture Kv= 7.0 fps |
| 5.0  | ) 367     | 0.0599  | ) 1.22      |             | Shallow Concentrated Flow,      |
|      |           |         |             |             | Woodland Kv= 5.0 fps            |
| 12.6 | 642       | Total   |             |             |                                 |

#### **Summary for Subcatchment SC4.0:**

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 0 cf, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| A     | rea (sf) | CN I    | Description |              |  |
|-------|----------|---------|-------------|--------------|--|
|       | 6,053    | 98      | Jnconnecte  | ed pavemer   | nt, HSG C                                  |
|       | 8,988    | 70      | Noods, Go   | od, HSG C    |  |
|       | 15,041   | 81      | Neighted A  | verage       |  |
|       | 8,988    | !       | 59.75% Pei  | vious Area   |  |
|       | 6,053    | 4       | 40.25% Imp  | pervious Are | ea   |
|       | 6,053    |         | 100.00% U   | nconnected   | 1  |
|       |          |         |             |              |  |
| Тс    | Length   | Slope   | Velocity    | Capacity     | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |  |
| 6.1   | 50       | 0.1200  | 0.14        |              | Sheet Flow,                                |
|       |          |         |             |              | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 0.7   | 48       | 0.0520  | 1.14        |              | Shallow Concentrated Flow,                 |
|       |          |         |             |              | Woodland Kv= 5.0 fps                       |
| 6.8   | 98       | Total   |             |              |  |

Five Paths, Wayland MA Project No. 171053Pre-DevNRCC 24-hr D0.5 Inch Rainfall=0.50"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 6

#### Summary for Link AP1:

| Inflow A | Area = | : | 215,046 sf, | 4.94% Impervious, | Inflow Depth = 0.00" | for 0.5 Inch event   |
|----------|--------|---|-------------|-------------------|----------------------|----------------------|
| Inflow   | =      |   | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf                 |                      |
| Primary  | y =    |   | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf, Atte           | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP2:

| Inflow A | rea = | 53,073 sf, | 16.30% Impervious, | Inflow Depth = 0.00" | for 0.5 Inch event   |
|----------|-------|------------|--------------------|----------------------|----------------------|
| Inflow   | =     | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf                 |                      |
| Primary  | =     | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf, Atte           | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP3:

| Inflow A | rea = | 195,127 sf, | 1.28% Impervious, | Inflow Depth = $0.00"$ | for 0.5 Inch event   |
|----------|-------|-------------|-------------------|------------------------|----------------------|
| Inflow   | =     | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf                   |                      |
| Primary  | =     | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf, Atte             | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP4:

| Inflow A | Area = | = | 15,041 sf, | 40.25% In  | npervious, | Inflow Depth > | 0.0 | 00" fo | r 0.5 | 5 Inch e | event   |
|----------|--------|---|------------|------------|------------|----------------|-----|--------|-------|----------|---------|
| Inflow   | =      |   | 0.0 cfs @  | 24.00 hrs, | Volume=    | 0              | cf  |        |       |          |         |
| Primary  | y =    |   | 0.0 cfs @  | 24.00 hrs, | Volume=    | 0              | cf, | Atten= | 0%,   | Lag=     | 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

| Pre-Dev<br>Prepared by Goldsmith, Prest & Ringw<br>HydroCAD® 10.10-4a s/n 01036 © 2020 Hyd   | Five Paths, Wayland MA Project No. 171053<br>NRCC 24-hr D 1 Inch Rainfall=1.00"<br>all, Inc. Printed 6/23/2020<br>broCAD Software Solutions LLC Page 7 |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
| Time span=0.00-24.00 hrs, dt=0.05 hrs, 481 points<br>Runoff by SCS TR-20 method, UH=SCS, Weighted-CN<br>Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method |  |  |  |  |  |  |  |  |
| SubcatchmentSC1.0:   | Runoff Area=215,046 sf 4.94% Impervious Runoff Depth>0.01"<br>Flow Length=646' Tc=6.7 min CN=72 Runoff=0.0 cfs 213 cf                                  |  |  |  |  |  |  |  |
| Subcatchment SC2.0: Flow   | Runoff Area=53,073 sf 16.30% Impervious Runoff Depth>0.01"<br>Length=190' Tc=7.2 min UI Adjusted CN=72 Runoff=0.0 cfs 53 cf                            |  |  |  |  |  |  |  |
| SubcatchmentSC3.0:   | Runoff Area=195,127 sf   1.28% Impervious   Runoff Depth>0.01"<br>Flow Length=642'   Tc=12.6 min   CN=71   Runoff=0.0 cfs   124 cf                     |  |  |  |  |  |  |  |
| SubcatchmentSC4.0:   | Runoff Area=15,041 sf 40.25% Impervious Runoff Depth>0.10"<br>Flow Length=98' Tc=6.8 min CN=81 Runoff=0.0 cfs 122 cf                                   |  |  |  |  |  |  |  |
| Link AP1:  | Inflow=0.0 cfs 213 cf<br>Primary=0.0 cfs 213 cf  |  |  |  |  |  |  |  |
| Link AP2:  | Inflow=0.0 cfs 53 cf<br>Primary=0.0 cfs 53 cf  |  |  |  |  |  |  |  |
| Link AP3:  | Inflow=0.0 cfs 124 cf<br>Primary=0.0 cfs 124 cf  |  |  |  |  |  |  |  |
| Link AP4:  | Inflow=0.0 cfs 122 cf<br>Primary=0.0 cfs 122 cf  |  |  |  |  |  |  |  |

Total Runoff Area = 478,286 sf Runoff Volume = 512 cfAverage Runoff Depth = 0.01"94.18% Pervious = 450,461 sf5.82% Impervious = 27,826 sf

Five Paths, Wayland MA Project No. 171053<br/>NRCC 24-hr D 1 Inch Rainfall=1.00"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 8

#### Summary for Subcatchment SC1.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 213 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A     | rea (sf) | CN [                  | Description                   |          |                                    |  |  |
|-------|----------|-----------------------|-------------------------------|----------|------------------------------------|--|--|
| 1     | 65,508   | 70 V                  | 0 Woods, Good, HSG C          |          |                                    |  |  |
|       | 38,916   | 74 >                  | >75% Grass cover, Good, HSG C |          |                                    |  |  |
|       | 778      | 98 l                  | Unconnected pavement, HSG C   |          |                                    |  |  |
|       | 7,395    | 98 F                  | Paved parking, HSG C          |          |                                    |  |  |
|       | 2,449    | 98 F                  | Roofs, HSG C                  |          |                                    |  |  |
| 2     | 15,046   | 72 Weighted Average   |                               |          |                                    |  |  |
| 2     | 04,424   | 95.06% Pervious Area  |                               |          |                                    |  |  |
|       | 10,622   | 4.94% Impervious Area |                               |          |                                    |  |  |
|       | 778      | 7.32% Unconnected     |                               |          |                                    |  |  |
|       |          |                       |                               |          |                                    |  |  |
| Тс    | Length   | Slope                 | Velocity                      | Capacity | Description                        |  |  |
| (min) | (feet)   | (ft/ft)               | (ft/sec)                      | (cfs)    |                                    |  |  |
| 0.7   | 50       | 0.0200                | 1.19                          |          | Sheet Flow,                        |  |  |
|       |          |                       |                               |          | Smooth surfaces n= 0.011 P2= 3.16" |  |  |
| 0.2   | 32       | 0.0200                | 2.87                          |          | Shallow Concentrated Flow,         |  |  |
|       |          |                       |                               |          | Paved Kv= 20.3 fps                 |  |  |
| 5.8   | 564      | 0.1046                | 1.62                          |          | Shallow Concentrated Flow,         |  |  |
|       |          |                       |                               |          | Woodland Kv= 5.0 fps               |  |  |
| 6.7   | 646      | Total                 |                               |          |                                    |  |  |

#### Summary for Subcatchment SC2.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 53 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A            | rea (sf) | CN /                | Adj Desc               | Description                   |  |  |
|--------------|----------|---------------------|------------------------|-------------------------------|--|--|
|              | 8,651    | 98                  | Unco                   | Unconnected pavement, HSG C   |  |  |
|              | 44,422   | 70                  | Woo                    | ds, Good, H                   | HSG C                                      |  |
|              | 53,073   | 75                  | 72 Weig                | Weighted Average, UI Adjusted |  |  |
|              | 44,422   |                     | 83.7                   | 83.70% Pervious Área          |  |  |
|              | 8,651    |                     | 16.30% Impervious Area |                               |  |  |
|              | 8,651    | 100.00% Unconnected |                        |                               |  |  |
| -            |          |                     |                        | <b>o</b>                      |  |  |
| IC           | Length   | Slope               | Velocity               | Capacity                      | Description                                |  |
| <u>(min)</u> | (feet)   | (ft/ft)             | (ft/sec)               | (cfs)                         |  |  |
| 6.1          | 50       | 0.1200              | 0.14                   |                               | Sheet Flow,                                |  |
|              |          |                     |                        |                               | Woods: Light underbrush n= 0.400 P2= 3.16" |  |
| 1.1          | 140      | 0.1714              | 2.07                   |                               | Shallow Concentrated Flow,                 |  |
|              |          |                     |                        |                               | Woodland Kv= 5.0 fps                       |  |
| 7.2          | 190      | Total               |                        |                               |  |  |
Five Paths, Wayland MA Project No. 171053<br/>NRCC 24-hr D 1 Inch Rainfall=1.00"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 9

#### Summary for Subcatchment SC3.0:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 124 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A     | rea (sf) | CN      | Description |              |                                 |
|-------|----------|---------|-------------|--------------|---------------------------------|
| 1     | 68,267   | 70      | Woods, Go   | od, HSG C    |                                 |
|       | 24,360   | 74      | >75% Gras   | s cover, Go  | ood, HSG C                      |
|       | 55       | 98      | Paved park  | ing, HSG C   |                                 |
|       | 1,425    | 98      | Roofs, HSG  | G C          |                                 |
|       | 1,019    | 98      | Unconnecte  | ed pavemer   | nt, HSG C                       |
| 1     | 95,127   | 71      | Weighted A  | verage       |                                 |
| 1     | 92,627   |         | 98.72% Pei  | vious Area   |                                 |
|       | 2,499    |         | 1.28% Impe  | ervious Area | а                               |
|       | 1,019    |         | 40.77% Un   | connected    |                                 |
|       |          |         |             |              |                                 |
| Тс    | Length   | Slope   | Velocity    | Capacity     | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                 |
| 5.7   | 50       | 0.0200  | 0.15        |              | Sheet Flow,                     |
|       |          |         |             |              | Grass: Short n= 0.150 P2= 3.16" |
| 1.9   | 225      | 0.0800  | 1.98        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps |
| 5.0   | 367      | 0.0599  | 1.22        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Woodland Kv= 5.0 fps            |
| 12.6  | 642      | Total   |             |              |                                 |

# Summary for Subcatchment SC4.0:

Runoff = 0.0 cfs @ 12.18 hrs, Volume= 122 cf, Depth> 0.10"

| A            | rea (sf) | CN I    | Description |              |  |
|--------------|----------|---------|-------------|--------------|--|
|              | 6,053    | 98 l    | Jnconnecte  | ed pavemer   | nt, HSG C                                  |
|              | 8,988    | 70 \    | Noods, Go   | od, HSG C    |  |
|              | 15,041   | 81 \    | Neighted A  | verage       |  |
|              | 8,988    | Ę       | 59.75% Per  | vious Area   |  |
|              | 6,053    | 4       | 10.25% Imp  | pervious Are | ea   |
|              | 6,053    |         | 100.00% Ui  | nconnected   | 1  |
| _            |          |         |             |              |  |
| Tc           | Length   | Slope   | Velocity    | Capacity     | Description                                |
| <u>(min)</u> | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |  |
| 6.1          | 50       | 0.1200  | 0.14        |              | Sheet Flow,                                |
|              |          |         |             |              | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 0.7          | 48       | 0.0520  | 1.14        |              | Shallow Concentrated Flow,                 |
|              |          |         |             |              | Woodland Kv= 5.0 fps                       |
| 6.8          | 98       | Total   |             |              |  |

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## Summary for Link AP1:

 Inflow Area =
 215,046 sf,
 4.94% Impervious, Inflow Depth > 0.01" for 1 Inch event

 Inflow =
 0.0 cfs @
 24.00 hrs, Volume=
 213 cf

 Primary =
 0.0 cfs @
 24.00 hrs, Volume=
 213 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP2:

| Inflow A | rea = | 53,073 sf, | 16.30% Impervious, | Inflow Depth > | 0.01"    | for 1 Inch event     |
|----------|-------|------------|--------------------|----------------|----------|----------------------|
| Inflow   | =     | 0.0 cfs @  | 24.00 hrs, Volume= | 53 0           | cf       |                      |
| Primary  | =     | 0.0 cfs @  | 24.00 hrs, Volume= | 53 (           | of, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP3:

| Inflow Are | a = | 195,127 sf, | 1.28% Impervious,  | Inflow Depth > ( | D.01" f  | or 1 Inch event    |
|------------|-----|-------------|--------------------|------------------|----------|--------------------|
| Inflow     | =   | 0.0 cfs @   | 24.00 hrs, Volume= | 124 cf           |          |                    |
| Primary    | =   | 0.0 cfs @   | 24.00 hrs, Volume= | 124 cf           | , Atten= | = 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP4:

 Inflow Area =
 15,041 sf, 40.25% Impervious, Inflow Depth > 0.10" for 1 Inch event

 Inflow =
 0.0 cfs @ 12.18 hrs, Volume=
 122 cf

 Primary =
 0.0 cfs @ 12.18 hrs, Volume=
 122 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

|  | Five Paths, Way   | land MA Project No. 171053                                   |
|--|---|--|
| Pre-Dev  | NRCC 24-h   | nr D 2-Year Rainfall=3.16"                                   |
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| HydroCAD® 10.10-4a s/n 01036 © 2020 Hyd                          | roCAD Software Solutions LLC  | Page 11  |
| Time span=0.0<br>Runoff by SCS T<br>Reach routing by Dyn-Stor-In | 0-24.00 hrs, dt=0.05 hrs, 481 points<br>R-20 method, UH=SCS, Weighted-(<br>d method - Pond routing by Dyn-S | s<br>CN<br>tor-Ind method                                    |
| SubcatchmentSC1.0:   | Runoff Area=215,046 sf 4.94% Im<br>Flow Length=646' Tc=6.7 min CN   | pervious Runoff Depth>0.90"<br>=72 Runoff=4.5 cfs 16,177 cf  |
| Subcatchment SC2.0: Flow Len                                     | Runoff Area=53,073 sf 16.30% Im<br>ngth=190' Tc=7.2 min UI Adjusted CI                                      | npervious Runoff Depth>0.90"<br>N=72 Runoff=1.1 cfs 3,992 cf |
| Subcatchment SC3.0:  | Runoff Area=195,127 sf 1.28% Im<br>Flow Length=642' Tc=12.6 min CN  | pervious Runoff Depth>0.85"<br>=71 Runoff=3.0 cfs 13,814 cf  |
| Subcatchment SC4.0:  | Runoff Area=15,041 sf 40.25% Im<br>Flow Length=98' Tc=6.8 min Ct  | pervious Runoff Depth>1.43"<br>N=81 Runoff=0.5 cfs 1,798 cf  |
| Link AP1:  |   | Inflow=4.5 cfs 16,177 cf<br>Primary=4.5 cfs 16,177 cf        |
| Link AP2:  |   | Inflow=1.1 cfs 3,992 cf<br>Primary=1.1 cfs 3,992 cf          |
| Link AP3:  |   | Inflow=3.0 cfs 13,814 cf<br>Primary=3.0 cfs 13,814 cf        |
| Link AP4:  |   | Inflow=0.5 cfs 1,798 cf<br>Primary=0.5 cfs 1,798 cf          |
|  |   |  |

Total Runoff Area = 478,286 sf Runoff Volume = 35,781 cfAverage Runoff Depth = 0.90"94.18% Pervious = 450,461 sf5.82% Impervious = 27,826 sf

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#### Summary for Subcatchment SC1.0:

Runoff = 4.5 cfs @ 12.14 hrs, Volume= 16,177 cf, Depth> 0.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A     | rea (sf) | CN      | Description |             |                                    |
|-------|----------|---------|-------------|-------------|------------------------------------|
| 1     | 65,508   | 70      | Woods, Go   | od, HSG C   |                                    |
|       | 38,916   | 74      | >75% Gras   | s cover, Go | ood, HSG C                         |
|       | 778      | 98      | Unconnecte  | ed pavemer  | nt, HSG C                          |
|       | 7,395    | 98      | Paved park  | ing, HSG C  |                                    |
|       | 2,449    | 98      | Roofs, HSC  | S C         |                                    |
| 2     | 15,046   | 72      | Weighted A  | verage      |                                    |
| 2     | 04,424   | 1       | 95.06% Pei  | vious Area  |                                    |
|       | 10,622   |         | 4.94% Impe  | ervious Are | а                                  |
|       | 778      |         | 7.32% Unco  | onnected    |                                    |
|       |          |         |             |             |                                    |
| Тс    | Length   | Slope   | Velocity    | Capacity    | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                    |
| 0.7   | 50       | 0.0200  | 1.19        |             | Sheet Flow,                        |
|       |          |         |             |             | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 32       | 0.0200  | 2.87        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Paved Kv= 20.3 fps                 |
| 5.8   | 564      | 0.1046  | 1.62        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Woodland Kv= 5.0 fps               |
| 6.7   | 646      | Total   |             |             |                                    |

# Summary for Subcatchment SC2.0:

Runoff = 1.1 cfs @ 12.15 hrs, Volume= 3,992 cf, Depth> 0.90"

| A     | rea (sf) | CN /     | Adj Desc | ription     |  |
|-------|----------|----------|----------|-------------|--|
|       | 8,651    | 98<br>70 | Unco     | onnected pa | avement, HSG C                             |
|       | 44,422   | 70       | 0000     | as, Gooa, F | 1366                                       |
|       | 53,073   | 75       | 72 Weig  | hted Avera  | age, UI Adjusted                           |
|       | 44,422   |          | 83.70    | 0% Perviou  | is Area                                    |
|       | 8.651    |          | 16.30    | )% Impervi  | ous Area                                   |
|       | 8 651    |          | 100 (    | 0% Uncor    | inected                                    |
|       | 0,001    |          | 100.     |             |  |
| Тс    | Length   | Slope    | Velocity | Capacity    | Description                                |
| (min) | (feet)   | (ft/ft)  | (ft/sec) | (cfs)       |  |
| 6.1   | 50       | 0.1200   | 0.14     |             | Sheet Flow.                                |
|       |          |          | ••••     |             | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 11    | 140      | 0 1714   | 2 07     |             | Shallow Concentrated Flow                  |
|       | 140      | 0.1714   | 2.07     |             | Woodland $Ky = 5.0 \text{ fns}$            |
| 7.0   | 400      | Tatal    |          |             |  |
| 7.2   | 190      | rotal    |          |             |  |

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#### Summary for Subcatchment SC3.0:

Runoff = 3.0 cfs @ 12.22 hrs, Volume= 13,814 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A     | rea (sf) | CN      | Description |             |                                 |
|-------|----------|---------|-------------|-------------|---------------------------------|
| 1     | 68,267   | 70      | Woods, Go   | od, HSG C   |                                 |
|       | 24,360   | 74      | >75% Gras   | s cover, Go | ood, HSG C                      |
|       | 55       | 98      | Paved park  | ing, HSG C  |                                 |
|       | 1,425    | 98      | Roofs, HSO  | G C         |                                 |
|       | 1,019    | 98      | Unconnecte  | ed pavemer  | nt, HSG C                       |
| 1     | 95,127   | 71      | Weighted A  | verage      |                                 |
| 1     | 92,627   |         | 98.72% Pei  | vious Area  |                                 |
|       | 2,499    |         | 1.28% Impe  | ervious Are | а                               |
|       | 1,019    |         | 40.77% Un   | connected   |                                 |
|       |          |         |             |             |                                 |
| Тс    | Length   | Slope   | e Velocity  | Capacity    | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                 |
| 5.7   | 50       | 0.0200  | 0.15        |             | Sheet Flow,                     |
|       |          |         |             |             | Grass: Short n= 0.150 P2= 3.16" |
| 1.9   | 225      | 0.0800  | 1.98        |             | Shallow Concentrated Flow,      |
|       |          |         |             |             | Short Grass Pasture Kv= 7.0 fps |
| 5.0   | 367      | 0.0599  | 1.22        |             | Shallow Concentrated Flow,      |
|       |          |         |             |             | Woodland Kv= 5.0 fps            |
| 12.6  | 642      | Total   |             |             |                                 |

# Summary for Subcatchment SC4.0:

Runoff = 0.5 cfs @ 12.14 hrs, Volume= 1,798 cf, Depth> 1.43"

| A     | rea (sf) | CN I    | Description |              |  |
|-------|----------|---------|-------------|--------------|--|
|       | 6,053    | 98 1    | Jnconnecte  | ed pavemer   | nt, HSG C                                  |
|       | 8,988    | 70      | Noods, Go   | od, HSG C    |  |
|       | 15,041   | 81 \    | Neighted A  | verage       |  |
|       | 8,988    | Ę       | 59.75% Per  | vious Area   |  |
|       | 6,053    | 4       | 40.25% Imp  | pervious Are | ea   |
|       | 6,053    |         | 100.00% Ui  | nconnected   | 1  |
|       |          |         |             |              |  |
| Тс    | Length   | Slope   | Velocity    | Capacity     | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |  |
| 6.1   | 50       | 0.1200  | 0.14        |              | Sheet Flow,                                |
|       |          |         |             |              | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 0.7   | 48       | 0.0520  | 1.14        |              | Shallow Concentrated Flow,                 |
|       |          |         |             |              | Woodland Kv= 5.0 fps                       |
| 6.8   | 98       | Total   |             |              |  |

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## Summary for Link AP1:

 Inflow Area =
 215,046 sf,
 4.94% Impervious, Inflow Depth > 0.90" for 2-Year event

 Inflow =
 4.5 cfs @
 12.14 hrs, Volume=
 16,177 cf

 Primary =
 4.5 cfs @
 12.14 hrs, Volume=
 16,177 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### **Summary for Link AP2:**

| Inflow A | rea = | 53,073 sf, | 16.30% Impervious, | Inflow Depth > | 0.90"   | for 2-Year event     |
|----------|-------|------------|--------------------|----------------|---------|----------------------|
| Inflow   | =     | 1.1 cfs @  | 12.15 hrs, Volume= | 3,992 c        | f       |                      |
| Primary  | =     | 1.1 cfs @  | 12.15 hrs, Volume= | 3,992 c        | f, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP3:

| Inflow Are | ea = | 195,127 sf, | 1.28% Impervious,  | Inflow Depth > 0.8 | 5" for 2-Year event    |
|------------|------|-------------|--------------------|--------------------|------------------------|
| Inflow     | =    | 3.0 cfs @   | 12.22 hrs, Volume= | 13,814 cf          |                        |
| Primary    | =    | 3.0 cfs @   | 12.22 hrs, Volume= | 13,814 cf, A       | tten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP4:

 Inflow Area =
 15,041 sf, 40.25% Impervious, Inflow Depth > 1.43" for 2-Year event

 Inflow =
 0.5 cfs @ 12.14 hrs, Volume=
 1,798 cf

 Primary =
 0.5 cfs @ 12.14 hrs, Volume=
 1,798 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

|   | Five Paths, Wayla                     | ind MA Project No. 171053   |
|---|---------------------------------------|-----------------------------|
| Pre-Dev                                   | NRCC 24-hr L                          | 0 10-Year Rainfall=4.77"    |
| Prepared by Goldsmith. Prest & Ringw      | vall. Inc.                            | Printed 6/23/2020           |
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|   |                                       |                             |
| Time span=0.0                             | 00-24.00 hrs, dt=0.05 hrs, 481 points |                             |
| Runoff by SCS 1                           | TR-20 method, UH=SCS, Weighted-C      | N                           |
| Reach routing by Dyn-Stor-I               | nd method - Pond routing by Dyn-Sto   | or-Ind method               |
| Subcatchmont SC1 0:                       | Runoff Area=215 046 sf 4 94% Imr      | pervious Runoff Depth>2.02" |
| Subcatchinent SC1.0.                      | Flow   ength=646' Tc=6 7 min CN=7     | 2 Runoff=10.5 cfs 36.167 cf |
|   |                                       |                             |
| SubcatchmentSC2.0:                        | Runoff Area=53,073 sf 16.30% Imp      | ervious Runoff Depth>2.02"  |
| Flow Le                                   | ength=190' Tc=7.2 min UI Adjusted CN  | =72 Runoff=2.6 cfs 8,924 cf |
| Out a state way to 0.02 Ou                | Dunoff Area-105 127 of 1 280/ Imm     | antique Dunoff Donth 1 04"  |
| Subcatchment SC3.0:                       | Flow Length=642' Tc=12.6 min CN=      | 71 Runoff=7.4 cfs 31.474 cf |
|   | TIOW Length=042 TC=12.0 min CN=       |                             |
| SubcatchmentSC4.0:                        | Runoff Area=15,041 sf 40.25% Imp      | ervious Runoff Depth>2.78"  |
|   | Flow Length=98' Tc=6.8 min CN         | =81 Runoff=1.0 cfs 3,482 cf |
|   |                                       |                             |
| Link AP1:                                 |                                       | Inflow=10.5 cfs 36,167 cf   |
|   |                                       | Primary=10.5 cis 36,167 ci  |
| Link AP2:                                 |                                       | Inflow=2.6 cfs 8,924 cf     |
|   |                                       | Primary=2.6 cfs 8,924 cf    |
|   |                                       |                             |
| Link AP3:                                 |                                       | Inflow=7.4 cfs 31,474 cf    |
|   |                                       | Primary=7.4 cfs 31,474 cf   |
| l ink AP4                                 |                                       | Inflow=1.0 cfs 3.482 cf     |
|   |                                       | Primary=1.0 cfs 3,482 cf    |
|   |                                       | •                           |
|   |                                       |                             |

Total Runoff Area = 478,286 sf Runoff Volume = 80,046 cfAverage Runoff Depth = 2.01"94.18% Pervious = 450,461 sf5.82% Impervious = 27,826 sf

Five Paths, Wayland MA Project No. 171053Pre-DevNRCC 24-hr D10-Year Rainfall=4.77"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 16

#### Summary for Subcatchment SC1.0:

Runoff = 10.5 cfs @ 12.14 hrs, Volume= 36,167 cf, Depth> 2.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| A     | rea (sf) | CN      | Description |             |                                    |
|-------|----------|---------|-------------|-------------|------------------------------------|
| 1     | 65,508   | 70      | Woods, Go   | od, HSG C   |                                    |
|       | 38,916   | 74      | >75% Gras   | s cover, Go | ood, HSG C                         |
|       | 778      | 98      | Unconnecte  | ed pavemer  | nt, HSG C                          |
|       | 7,395    | 98      | Paved park  | ing, HSG C  |                                    |
|       | 2,449    | 98      | Roofs, HSC  | S C         |                                    |
| 2     | 15,046   | 72      | Weighted A  | verage      |                                    |
| 2     | 04,424   |         | 95.06% Per  | vious Area  |                                    |
|       | 10,622   |         | 4.94% Impe  | ervious Are | а                                  |
|       | 778      |         | 7.32% Unco  | onnected    |                                    |
|       |          |         |             |             |                                    |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                    |
| 0.7   | 50       | 0.0200  | 1.19        |             | Sheet Flow,                        |
|       |          |         |             |             | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 32       | 0.0200  | 2.87        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Paved Kv= 20.3 fps                 |
| 5.8   | 564      | 0.1046  | 1.62        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Woodland Kv= 5.0 fps               |
| 6.7   | 646      | Total   |             |             |                                    |

# Summary for Subcatchment SC2.0:

Runoff = 2.6 cfs @ 12.15 hrs, Volume= 8,924 cf, Depth> 2.02"

| A     | rea (sf) | CN /    | Adj Desc | ription                     |  |  |  |  |  |
|-------|----------|---------|----------|-----------------------------|--|--|--|--|--|
|       | 8,651    | 98      | Unco     | Unconnected pavement, HSG C |  |  |  |  |  |
|       | 44,422   | 70      | Woo      | <u>ds, Good, I</u>          | HSG C                                      |  |  |  |  |
|       | 53,073   | 75      | 72 Weig  | hted Avera                  | age, UI Adjusted                           |  |  |  |  |
|       | 44,422   |         | 83.70    | 0% Perviou                  | is Area                                    |  |  |  |  |
|       | 8,651    |         | 16.30    | 0% Impervi                  | ous Area                                   |  |  |  |  |
|       | 8,651    |         | 100.0    | 00% Uncor                   | nnected                                    |  |  |  |  |
|       |          |         |          |                             |  |  |  |  |  |
| Tc    | Length   | Slope   | Velocity | Capacity                    | Description                                |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec) | (cfs)                       |  |  |  |  |  |
| 6.1   | 50       | 0.1200  | 0.14     |                             | Sheet Flow,                                |  |  |  |  |
|       |          |         |          |                             | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |  |
| 1.1   | 140      | 0.1714  | 2.07     |                             | Shallow Concentrated Flow,                 |  |  |  |  |
|       |          |         |          |                             | Woodland Kv= 5.0 fps                       |  |  |  |  |
| 7.2   | 190      | Total   |          |                             |  |  |  |  |  |

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#### Summary for Subcatchment SC3.0:

Runoff = 7.4 cfs @ 12.21 hrs, Volume= 31,474 cf, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| Α     | rea (sf) | CN [    | Description |              |                                 |
|-------|----------|---------|-------------|--------------|---------------------------------|
| 1     | 68,267   | 70 \    | Noods, Go   | od, HSG C    |                                 |
|       | 24,360   | 74 >    | >75% Gras   | s cover, Go  | ood, HSG C                      |
|       | 55       | 98 F    | Paved park  | ing, HSG C   |                                 |
|       | 1,425    | 98 F    | Roofs, HSG  | G C          |                                 |
|       | 1,019    | 98 l    | Jnconnecte  | ed pavemer   | nt, HSG C                       |
| 1     | 95,127   | 71 \    | Neighted A  | verage       |                                 |
| 1     | 92,627   | ç       | 98.72% Per  | vious Area   |                                 |
|       | 2,499    |         | 1.28% Impe  | ervious Area | а                               |
|       | 1,019    | 2       | 10.77% Un   | connected    |                                 |
|       |          |         |             |              |                                 |
| Tc    | Length   | Slope   | Velocity    | Capacity     | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                 |
| 5.7   | 50       | 0.0200  | 0.15        |              | Sheet Flow,                     |
|       |          |         |             |              | Grass: Short n= 0.150 P2= 3.16" |
| 1.9   | 225      | 0.0800  | 1.98        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps |
| 5.0   | 367      | 0.0599  | 1.22        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Woodland Kv= 5.0 fps            |
|       |          |         |             |              |                                 |

# Summary for Subcatchment SC4.0:

Runoff = 1.0 cfs @ 12.14 hrs, Volume= 3,482 cf, Depth> 2.78"

| A     | rea (sf) | CN [    | Description |            |  |
|-------|----------|---------|-------------|------------|--|
|       | 6,053    | 98 l    | Jnconnecte  | ed pavemer | nt, HSG C                                  |
|       | 8,988    | 70 \    | Voods, Go   | od, HSG C  |  |
|       | 15,041   | 81 \    | Veighted A  | verage     |  |
|       | 8,988    | Ę       | 59.75% Per  | vious Area |  |
|       | 6,053    | 2       | 10.25% Imp  | ervious Ar | ea   |
|       | 6,053    |         | 100.00% Ui  | nconnected |  |
|       |          |         |             |            |  |
| Tc    | Length   | Slope   | Velocity    | Capacity   | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)      |  |
| 6.1   | 50       | 0.1200  | 0.14        |            | Sheet Flow,                                |
|       |          |         |             |            | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 0.7   | 48       | 0.0520  | 1.14        |            | Shallow Concentrated Flow,                 |
|       |          |         |             |            | Woodland Kv= 5.0 fps                       |
| 6.8   | 98       | Total   |             |            |  |

Five Paths, Wayland MA Project No. 171053Pre-DevNRCC 24-hr D10-Year Rainfall=4.77"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 18

## Summary for Link AP1:

 Inflow Area =
 215,046 sf,
 4.94% Impervious, Inflow Depth > 2.02" for 10-Year event

 Inflow =
 10.5 cfs @
 12.14 hrs, Volume=
 36,167 cf

 Primary =
 10.5 cfs @
 12.14 hrs, Volume=
 36,167 cf,

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP2:

| Inflow / | Area | a = | 53,073 sf, | 16.30% Impervious, | Inflow Depth > | 2.02   | for 10-Year event     |
|----------|------|-----|------------|--------------------|----------------|--------|-----------------------|
| Inflow   |      | =   | 2.6 cfs @  | 12.15 hrs, Volume= | 8,924 c        | of     |                       |
| Primary  | у    | =   | 2.6 cfs @  | 12.15 hrs, Volume= | 8,924 c        | cf, At | ten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP3:

| Inflow / | Area | = | 195,127 sf, | 1.28% Im   | pervious, | Inflow Depth > | 1.94'  | ' for 10 | -Year event  |
|----------|------|---|-------------|------------|-----------|----------------|--------|----------|--------------|
| Inflow   |      | = | 7.4 cfs @   | 12.21 hrs, | Volume=   | 31,474         | cf     |          |              |
| Primar   | у    | = | 7.4 cfs @   | 12.21 hrs, | Volume=   | 31,474         | cf, At | ten= 0%, | Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP4:

 Inflow Area =
 15,041 sf, 40.25% Impervious, Inflow Depth > 2.78" for 10-Year event

 Inflow =
 1.0 cfs @ 12.14 hrs, Volume=
 3,482 cf

 Primary =
 1.0 cfs @ 12.14 hrs, Volume=
 3,482 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

|                                       | Five Paths, Waylar   | nd MA Project No. 171053                                 |
|---------------------------------------|--|--|
| Pre-Dev                               | NRCC 24-hr D   | 25-Year Rainfall=6.03"                                   |
| Prepared by Goldsmith, Prest & Ring   | wall, Inc.   | Printed 6/23/2020  |
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| Time span=(<br>Runoff by SCS          | 0.00-24.00 hrs, dt=0.05 hrs, 481 points<br>5 TR-20 method, UH=SCS, Weighted-CN | -<br>-   |
| Reach routing by Dyn-Stor             | -Ind method - Pond routing by Dyn-Stor   | -Ind method  |
| SubcatchmentSC1.0:                    | Runoff Area=215,046 sf 4.94% Impe<br>Flow Length=646' Tc=6.7 min CN=72         | rvious Runoff Depth>3.01"<br>Runoff=15.8 cfs 53,979 cf   |
| Subcatchment SC2.0:                   | Runoff Area=53,073 sf 16.30% Impe<br>ength=190' Tc=7.2 min UI Adjusted CN=7    | rvious Runoff Depth>3.01"<br>2 Runoff=3.8 cfs 13,319 cf  |
| SubcatchmentSC3.0:                    | Runoff Area=195,127 sf 1.28% Impe<br>Flow Length=642' Tc=12.6 min CN=71        | rvious Runoff Depth>2.91"<br>Runoff=11.3 cfs 47,335 cf   |
| SubcatchmentSC4.0:                    | Runoff Area=15,041 sf 40.25% Impe<br>Flow Length=98' Tc=6.8 min CN=            | ervious Runoff Depth>3.90"<br>81 Runoff=1.4 cfs 4,894 cf |
| Link AP1:                             |  | Inflow=15.8 cfs 53,979 cf<br>Primary=15.8 cfs 53,979 cf  |
| Link AP2:                             |  | Inflow=3.8 cfs 13,319 cf<br>Primary=3.8 cfs 13,319 cf    |
| Link AP3:                             |  | Inflow=11.3 cfs 47,335 cf<br>Primary=11.3 cfs 47,335 cf  |
| Link AP4:                             |  | Inflow=1.4 cfs 4,894 cf<br>Primary=1.4 cfs 4,894 cf      |
|                                       |  |  |

Total Runoff Area = 478,286 sf Runoff Volume = 119,528 cfAverage Runoff Depth = 3.00"94.18% Pervious = 450,461 sf5.82% Impervious = 27,826 sf

Five Paths, Wayland MA Project No. 171053Pre-DevNRCC 24-hr D 25-Year Rainfall=6.03"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 20

#### Summary for Subcatchment SC1.0:

Runoff = 15.8 cfs @ 12.14 hrs, Volume= 53,979 cf, Depth> 3.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| A     | rea (sf) | CN I    | Description |             |                                    |
|-------|----------|---------|-------------|-------------|------------------------------------|
| 1     | 65,508   | 70      | Noods, Go   | od, HSG C   |                                    |
|       | 38,916   | 74 :    | >75% Gras   | s cover, Go | ood, HSG C                         |
|       | 778      | 98      | Jnconnecte  | ed pavemer  | nt, HSG C                          |
|       | 7,395    | 98      | Paved park  | ing, HSG C  |                                    |
|       | 2,449    | 98      | Roofs, HSG  | S C         |                                    |
| 2     | 15,046   | 72      | Neighted A  | verage      |                                    |
| 2     | 04,424   | ę       | 95.06% Per  | vious Area  |                                    |
|       | 10,622   | 4       | 4.94% Impe  | ervious Are | а                                  |
|       | 778      | -       | 7.32% Unco  | onnected    |                                    |
| _     |          |         |             | _           |                                    |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                    |
| 0.7   | 50       | 0.0200  | 1.19        |             | Sheet Flow,                        |
|       |          |         |             |             | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 32       | 0.0200  | 2.87        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Paved Kv= 20.3 fps                 |
| 5.8   | 564      | 0.1046  | 1.62        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Woodland Kv= 5.0 fps               |
| 6.7   | 646      | Total   |             |             |                                    |

# Summary for Subcatchment SC2.0:

Runoff = 3.8 cfs @ 12.14 hrs, Volume= 13,319 cf, Depth> 3.01"

| A     | rea (sf) | CN A    | Adj Desc | ription            |  |
|-------|----------|---------|----------|--------------------|--|
|       | 8,651    | 98      | Unco     | onnected pa        | avement, HSG C                             |
|       | 44,422   | 70      | Woo      | <u>ds, Good, I</u> | HSG C                                      |
|       | 53,073   | 75      | 72 Weig  | hted Avera         | age, UI Adjusted                           |
|       | 44,422   |         | 83.7     | 0% Perviou         | is Area                                    |
|       | 8,651    |         | 16.3     | 0% Impervi         | ous Area                                   |
|       | 8,651    |         | 100.0    | 00% Uncor          | inected                                    |
|       |          |         |          |                    |  |
| Тс    | Length   | Slope   | Velocity | Capacity           | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec) | (cfs)              |  |
| 6.1   | 50       | 0.1200  | 0.14     |                    | Sheet Flow,                                |
|       |          |         |          |                    | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 1.1   | 140      | 0.1714  | 2.07     |                    | Shallow Concentrated Flow,                 |
|       |          |         |          |                    | Woodland Kv= 5.0 fps                       |
| 7.2   | 190      | Total   |          |                    |  |

Five Paths, Wayland MA Project No. 171053Pre-DevNRCC 24-hr D 25-Year Rainfall=6.03"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 21

#### Summary for Subcatchment SC3.0:

Runoff = 11.3 cfs @ 12.21 hrs, Volume= 47,335 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| Α     | rea (sf) | CN      | Description |             |                                 |
|-------|----------|---------|-------------|-------------|---------------------------------|
| 1     | 68,267   | 70      | Woods, Go   | od, HSG C   |                                 |
|       | 24,360   | 74      | >75% Gras   | s cover, Go | ood, HSG C                      |
|       | 55       | 98      | Paved park  | ing, HSG C  |                                 |
|       | 1,425    | 98      | Roofs, HSG  | G C         |                                 |
|       | 1,019    | 98      | Unconnecte  | ed pavemer  | nt, HSG C                       |
| 1     | 95,127   | 71      | Weighted A  | verage      |                                 |
| 1     | 92,627   |         | 98.72% Per  | vious Area  |                                 |
|       | 2,499    |         | 1.28% Impe  | ervious Are | а                               |
|       | 1,019    |         | 40.77% Un   | connected   |                                 |
|       |          |         |             |             |                                 |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                 |
| 5.7   | 50       | 0.0200  | 0.15        |             | Sheet Flow,                     |
|       |          |         |             |             | Grass: Short n= 0.150 P2= 3.16" |
| 1.9   | 225      | 0.0800  | 1.98        |             | Shallow Concentrated Flow,      |
|       |          |         |             |             | Short Grass Pasture Kv= 7.0 fps |
| 5.0   | 367      | 0.0599  | 1.22        |             | Shallow Concentrated Flow,      |
|       |          |         |             |             | Woodland Kv= 5.0 fps            |
| 12.6  | 642      | Total   |             |             |                                 |

# Summary for Subcatchment SC4.0:

Runoff = 1.4 cfs @ 12.14 hrs, Volume= 4,894 cf, Depth> 3.90"

| A     | rea (sf) | CN E    | Description         |             |  |  |  |  |
|-------|----------|---------|---------------------|-------------|--|--|--|--|
|       | 6,053    | 98 L    | Inconnecte          | ed pavemer  | nt, HSG C                                  |  |  |  |
|       | 8,988    | 70 V    | Voods, Go           | od, HSG C   |  |  |  |  |
|       | 15,041   | 81 V    | Veighted A          | verage      |  |  |  |  |
|       | 8,988    | 5       | 9.75% Per           | vious Area  |  |  |  |  |
|       | 6,053    | 4       | 0.25% Imp           | ervious Are | ea   |  |  |  |
|       | 6,053    | 1       | 100.00% Unconnected |             |  |  |  |  |
|       |          |         |                     |             |  |  |  |  |
| Tc    | Length   | Slope   | Velocity            | Capacity    | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)            | (cfs)       |  |  |  |  |
| 6.1   | 50       | 0.1200  | 0.14                |             | Sheet Flow,                                |  |  |  |
|       |          |         |                     |             | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |
| 0.7   | 48       | 0.0520  | 1.14                |             | Shallow Concentrated Flow,                 |  |  |  |
|       |          |         |                     |             | Woodland Kv= 5.0 fps                       |  |  |  |
| 6.8   | 98       | Total   |                     |             |  |  |  |  |

|  | Five Paths, Wayland MA Project No. 171053 |
|--|---|
| Pre-Dev  | NRCC 24-hr D 25-Year Rainfall=6.03"       |
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# Summary for Link AP1:

| Inflow Ar | rea = | 215,046 sf, | 4.94% Impervious,  | Inflow Depth > | 3.01"   | for 25-Year event   |
|-----------|-------|-------------|--------------------|----------------|---------|---------------------|
| Inflow    | =     | 15.8 cfs @  | 12.14 hrs, Volume= | 53,979 c       | f       |                     |
| Primary   | =     | 15.8 cfs @  | 12.14 hrs, Volume= | 53,979 c       | f, Atte | n= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP2:

| Inflow A | Area | = | 53,073 sf, | 16.30% Impervio  | ous, Infl | low Depth > | 3.01  | " for 25  | -Year event  |
|----------|------|---|------------|------------------|-----------|-------------|-------|-----------|--------------|
| Inflow   | =    | = | 3.8 cfs @  | 12.14 hrs, Volur | ne=       | 13,319 (    | cf    |           |              |
| Primary  | / =  | = | 3.8 cfs @  | 12.14 hrs, Volur | ne=       | 13,319 a    | of, A | tten= 0%, | Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP3:

| Inflow Ar | rea = | 195,127 sf, | 1.28% Impervious,  | Inflow Depth > 2. | 91" for 25-Year event   |
|-----------|-------|-------------|--------------------|-------------------|-------------------------|
| Inflow    | =     | 11.3 cfs @  | 12.21 hrs, Volume= | 47,335 cf         |                         |
| Primary   | =     | 11.3 cfs @  | 12.21 hrs, Volume= | 47,335 cf,        | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## **Summary for Link AP4:**

 Inflow Area =
 15,041 sf, 40.25% Impervious, Inflow Depth > 3.90" for 25-Year event

 Inflow =
 1.4 cfs @ 12.14 hrs, Volume=
 4,894 cf

 Primary =
 1.4 cfs @ 12.14 hrs, Volume=
 4,894 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

|   | Five Paths, Waylar  | nd MA Project No. 171053                                 |
|---|---|--|
| Pre-Dev   | NRCC 24-hr D  | 100-Year Rainfall=8.62"                                  |
| Prepared by Goldsmith, Prest & Ring                       | ywall, Inc.   | Printed 6/23/2020  |
| HydroCAD® 10.10-4a s/n 01036 © 2020 H                     | lydroCAD Software Solutions LLC   | Page 23  |
| Time span=(<br>Runoff by SCS<br>Reach routing by Dyn-Stor | 0.00-24.00 hrs, dt=0.05 hrs, 481 points<br>5 TR-20 method, UH=SCS, Weighted-CN<br>-Ind method - Pond routing by Dyn-Sto | l<br>r-Ind method  |
| SubcatchmentSC1.0:  | Runoff Area=215,046 sf 4.94% Impe<br>Flow Length=646' Tc=6.7 min CN=72  | ervious Runoff Depth>5.23"<br>Runoff=27.2 cfs 93,791 cf  |
| Subcatchment SC2.0:                                       | Runoff Area=53,073 sf 16.30% Impe<br>ength=190' Tc=7.2 min UI Adjusted CN=7   | ervious Runoff Depth>5.23"<br>2 Runoff=6.6 cfs 23,144 cf |
| SubcatchmentSC3.0:  | Runoff Area=195,127 sf 1.28% Impe<br>Flow Length=642' Tc=12.6 min CN=71   | ervious Runoff Depth>5.10"<br>Runoff=19.7 cfs 82,984 cf  |
| SubcatchmentSC4.0:  | Runoff Area=15,041 sf 40.25% Impe<br>Flow Length=98' Tc=6.8 min CN=   | ervious Runoff Depth>6.32"<br>81 Runoff=2.2 cfs 7,922 cf |
| Link AP1:   |   | Inflow=27.2 cfs 93,791 cf<br>Primary=27.2 cfs 93,791 cf  |
| Link AP2:   |   | Inflow=6.6 cfs 23,144 cf<br>Primary=6.6 cfs 23,144 cf    |
| Link AP3:   |   | Inflow=19.7 cfs 82,984 cf<br>Primary=19.7 cfs 82,984 cf  |
| Link AP4:   |   | Inflow=2.2 cfs 7,922 cf<br>Primary=2.2 cfs 7,922 cf      |
|   | 0 of Dumoff Valumo - 007 044 of Acc   |  |

Total Runoff Area = 478,286 sf Runoff Volume = 207,841 cfAverage Runoff Depth = 5.21"94.18% Pervious = 450,461 sf5.82% Impervious = 27,826 sf

Five Paths, Wayland MA Project No. 171053**Pre-Dev**NRCC 24-hr D 100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 24

## Summary for Subcatchment SC1.0:

Runoff = 27.2 cfs @ 12.14 hrs, Volume= 93,791 cf, Depth> 5.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| A     | rea (sf) | CN I    | Description |             |                                    |
|-------|----------|---------|-------------|-------------|------------------------------------|
| 1     | 65,508   | 70      | Noods, Go   | od, HSG C   |                                    |
|       | 38,916   | 74 :    | >75% Gras   | s cover, Go | ood, HSG C                         |
|       | 778      | 98      | Jnconnecte  | ed pavemer  | nt, HSG C                          |
|       | 7,395    | 98      | Paved park  | ing, HSG C  |                                    |
|       | 2,449    | 98      | Roofs, HSG  | S C         |                                    |
| 2     | 15,046   | 72      | Neighted A  | verage      |                                    |
| 2     | 04,424   | ę       | 95.06% Per  | vious Area  |                                    |
|       | 10,622   | 4       | 4.94% Impe  | ervious Are | а                                  |
|       | 778      | -       | 7.32% Unco  | onnected    |                                    |
| _     |          |         |             | _           |                                    |
| Tc    | Length   | Slope   | Velocity    | Capacity    | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                    |
| 0.7   | 50       | 0.0200  | 1.19        |             | Sheet Flow,                        |
|       |          |         |             |             | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 32       | 0.0200  | 2.87        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Paved Kv= 20.3 fps                 |
| 5.8   | 564      | 0.1046  | 1.62        |             | Shallow Concentrated Flow,         |
|       |          |         |             |             | Woodland Kv= 5.0 fps               |
| 6.7   | 646      | Total   |             |             |                                    |

# Summary for Subcatchment SC2.0:

Runoff = 6.6 cfs @ 12.14 hrs, Volume= 23,144 cf, Depth> 5.23"

| A     | rea (sf)                     | CN A    | Adj Desc | ription              |  |  |  |  |
|-------|------------------------------|---------|----------|----------------------|--|--|--|--|
|       | 8,651                        | 98      | Unco     | onnected pa          | avement, HSG C                             |  |  |  |
|       | 44,422                       | 70      | Woo      | <u>ds, Good, I</u>   | HSG C                                      |  |  |  |
|       | 53,073                       | 75      | 72 Weig  | hted Avera           | age, UI Adjusted                           |  |  |  |
|       | 44,422                       |         | 83.7     | 83.70% Pervious Área |  |  |  |  |
|       | 8,651 16.30% Impervious Area |         |          |                      |  |  |  |  |
|       | 8,651                        |         | 100.0    | 00% Uncor            | inected                                    |  |  |  |
|       |                              |         |          |                      |  |  |  |  |
| Тс    | Length                       | Slope   | Velocity | Capacity             | Description                                |  |  |  |
| (min) | (feet)                       | (ft/ft) | (ft/sec) | (cfs)                |  |  |  |  |
| 6.1   | 50                           | 0.1200  | 0.14     |                      | Sheet Flow,                                |  |  |  |
|       |                              |         |          |                      | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |
| 1.1   | 140                          | 0.1714  | 2.07     |                      | Shallow Concentrated Flow,                 |  |  |  |
|       |                              |         |          |                      | Woodland Kv= 5.0 fps                       |  |  |  |
| 7.2   | 190                          | Total   |          |                      |  |  |  |  |

Five Paths, Wayland MA Project No. 171053**Pre-Dev**NRCC 24-hr D 100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 6/23/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 25

## Summary for Subcatchment SC3.0:

Runoff = 19.7 cfs @ 12.20 hrs, Volume= 82,984 cf, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| A     | rea (sf) | CN      | Description |             |                                 |
|-------|----------|---------|-------------|-------------|---------------------------------|
| 1     | 68,267   | 70      | Woods, Go   | od, HSG C   |                                 |
|       | 24,360   | 74      | >75% Gras   | s cover, Go | bod, HSG C                      |
|       | 55       | 98      | Paved park  | ing, HSG C  |                                 |
|       | 1,425    | 98      | Roofs, HSG  | G C         |                                 |
|       | 1,019    | 98      | Unconnecte  | ed pavemer  | nt, HSG C                       |
| 1     | 95,127   | 71      | Weighted A  | verage      |                                 |
| 1     | 92,627   |         | 98.72% Pei  | vious Area  |                                 |
|       | 2,499    |         | 1.28% Impe  | ervious Are | а                               |
|       | 1,019    |         | 40.77% Un   | connected   |                                 |
|       |          |         |             |             |                                 |
| Tc    | Length   | Slope   | e Velocity  | Capacity    | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)       |                                 |
| 5.7   | 50       | 0.0200  | 0.15        |             | Sheet Flow,                     |
|       |          |         |             |             | Grass: Short n= 0.150 P2= 3.16" |
| 1.9   | 225      | 0.0800  | 1.98        |             | Shallow Concentrated Flow,      |
|       |          |         |             |             | Short Grass Pasture Kv= 7.0 fps |
| 5.0   | 367      | 0.0599  | 1.22        |             | Shallow Concentrated Flow,      |
|       |          |         |             |             | Woodland Kv= 5.0 fps            |
| 12.6  | 642      | Total   |             |             |                                 |

# Summary for Subcatchment SC4.0:

Runoff = 2.2 cfs @ 12.14 hrs, Volume= 7,922 cf, Depth> 6.32"

| A     | rea (sf) | CN I    | Description                    |              |  |  |  |  |
|-------|----------|---------|--------------------------------|--------------|--|--|--|--|
|       | 6,053    | 98      | 98 Unconnected pavement, HSG C |              |  |  |  |  |
|       | 8,988    | 70      | Noods, Go                      | od, HSG C    |  |  |  |  |
|       | 15,041   | 81      | 81 Weighted Average            |              |  |  |  |  |
|       | 8,988    |         | 59.75% Pei                     | vious Area   |  |  |  |  |
|       | 6,053    | 4       | 10.25% Imp                     | pervious Are | ea   |  |  |  |
|       | 6,053    |         | 100.00% U                      | nconnected   | 1  |  |  |  |
|       |          |         |                                |              |  |  |  |  |
| Tc    | Length   | Slope   | Velocity                       | Capacity     | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                       | (cfs)        |  |  |  |  |
| 6.1   | 50       | 0.1200  | 0.14                           |              | Sheet Flow,                                |  |  |  |
|       |          |         |                                |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |
| 0.7   | 48       | 0.0520  | 1.14                           |              | Shallow Concentrated Flow,                 |  |  |  |
|       |          |         |                                |              | Woodland Kv= 5.0 fps                       |  |  |  |
| 6.8   | 98       | Total   |                                |              |  |  |  |  |

|  | Five Paths, Wayla | nd MA Project No | o. 171053  |
|--|-------------------|------------------|------------|
| Pre-Dev  | NRCC 24-hr D      | 100-Year Rain    | fall=8.62" |
| Prepared by Goldsmith, Prest & Ringwall, Inc.            |                   | Printed (        | 6/23/2020  |
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# Summary for Link AP1:

| Inflow A | rea = | 215,046 sf, | 4.94% Impervious,  | Inflow Depth > 5. | 23" for 100-Year event  |
|----------|-------|-------------|--------------------|-------------------|-------------------------|
| Inflow   | =     | 27.2 cfs @  | 12.14 hrs, Volume= | 93,791 cf         |                         |
| Primary  | · =   | 27.2 cfs @  | 12.14 hrs, Volume= | 93,791 cf,        | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

#### Summary for Link AP2:

| Inflow Ar | ea = | 53,073 sf, | 16.30% Impervious, | Inflow Depth > 5 | .23" for 100-Year event |
|-----------|------|------------|--------------------|------------------|-------------------------|
| Inflow    | =    | 6.6 cfs @  | 12.14 hrs, Volume= | 23,144 cf        |                         |
| Primary   | =    | 6.6 cfs @  | 12.14 hrs, Volume= | 23,144 cf,       | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## **Summary for Link AP3:**

| Inflow Are | ea = | 195,127 sf, | 1.28% Impervious,  | Inflow Depth > 5 | 5.10" for 100-Year event  |
|------------|------|-------------|--------------------|------------------|---------------------------|
| Inflow     | =    | 19.7 cfs @  | 12.20 hrs, Volume= | 82,984 cf        |                           |
| Primary    | =    | 19.7 cfs @  | 12.20 hrs, Volume= | 82,984 cf,       | , Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

## **Summary for Link AP4:**

 Inflow Area =
 15,041 sf, 40.25% Impervious, Inflow Depth > 6.32" for 100-Year event

 Inflow =
 2.2 cfs @ 12.14 hrs, Volume=
 7,922 cf

 Primary =
 2.2 cfs @ 12.14 hrs, Volume=
 7,922 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs



|   | AP3                                       |                        |
|---|---|------------------------|
|   | - <u>SC3.4</u><br>- <u>SC4.1</u><br>AP4   | C4.2                   |
| 2 | SC2.1                                     |                        |
|   | WATERSHED<br>PROPOSED COM                 | MAP<br>NDITIONS        |
|   | FIVE PATH<br>Assessors map#39<br>Wayland, | IS<br>PARCEL 15A<br>MA |
|   | PROJECT: 171053                           | 1 of 1                 |



## Post-Dev Rev 2

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# Area Listing (all nodes)

| Area    | CN | Description  |
|---------|----|--|
| (sq-ft) |    | (subcatchment-numbers)   |
| 156,005 | 74 | >75% Grass cover, Good, HSG C (SC1.1, SC1.2, SC1.3, SC1.5, SC2.1, SC2.2, |
|         |    | SC3.1, SC3.2, SC3.3, SC3.4, SC4.1, SC4.2)                                |
| 1,665   | 89 | Gravel roads, HSG C (SC1.1, SC1.2, SC1.3, SC3.1, SC3.4)                  |
| 27,894  | 98 | Paved parking, HSG C (SC1.1, SC1.2, SC1.3, SC1.4, SC1.6, SC3.1, SC3.4)   |
| 9,202   | 98 | Roofs, HSG C (SC1.1, SC1.2, SC2.1, SC3.1, SC3.2)                         |
| 16,818  | 98 | Unconnected pavement, HSG C (SC1.2, SC1.5, SC2.2, SC3.3, SC4.1, SC4.2)   |
| 266,702 | 70 | Woods, Good, HSG C (SC1.1, SC1.2, SC1.5, SC2.2, SC3.1, SC3.2, SC3.3,     |
|         |    | SC3.4, SC4.1, SC4.2)   |
| 478,286 | 75 | TOTAL AREA   |

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.1:  | Runoff Area=54,522 sf 14.68% Impervious Runoff Depth=0.00"<br>Flow Length=549' Tc=7.5 min CN=76 Runoff=0.0 cfs 0 cf             |
|---------------------|---|
| SubcatchmentSC1.2:  | Runoff Area=115,523 sf 8.76% Impervious Runoff Depth=0.00"<br>Flow Length=510' Tc=6.7 min CN=74 Runoff=0.0 cfs 0 cf             |
| SubcatchmentSC1.3:  | Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>0.26"<br>Tc=5.0 min CN=97 Runoff=0.0 cfs 120 cf                             |
| SubcatchmentSC1.4:  | Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>0.32"<br>Tc=5.0 min CN=98 Runoff=0.0 cfs 58 cf                             |
| SubcatchmentSC1.5:  | Runoff Area=46,238 sf 0.95% Impervious Runoff Depth=0.00"<br>Flow Length=337' Tc=6.4 min CN=71 Runoff=0.0 cfs 0 cf              |
| SubcatchmentSC1.6:  | Runoff Area=622 sf 100.00% Impervious Runoff Depth>0.32"<br>Tc=5.0 min CN=98 Runoff=0.0 cfs 16 cf                               |
| SubcatchmentSC2.1:  | Runoff Area=3,729 sf   47.63% Impervious   Runoff Depth>0.01"<br>Flow Length=68'   Tc=5.0 min   CN=85   Runoff=0.0 cfs  3 cf    |
| SubcatchmentSC2.2:  | Runoff Area=38,441 sf 23.39% Impervious Runoff Depth=0.00"<br>Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=0.0 cfs 0 cf |
| SubcatchmentSC3.1:  | Runoff Area=66,880 sf 3.55% Impervious Runoff Depth=0.00"<br>Flow Length=564' Tc=10.4 min CN=73 Runoff=0.0 cfs 0 cf             |
| SubcatchmentSC3.2:  | Runoff Area=55,060 sf 1.60% Impervious Runoff Depth=0.00"<br>Flow Length=378' Tc=10.1 min CN=71 Runoff=0.0 cfs 0 cf             |
| Subcatchment SC3.3: | Runoff Area=62,459 sf 1.63% Impervious Runoff Depth=0.00"<br>Flow Length=287' Tc=10.8 min CN=71 Runoff=0.0 cfs 0 cf             |
| Subcatchment SC3.4: | Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>0.02"<br>Flow Length=246' Tc=5.0 min CN=86 Runoff=0.0 cfs 17 cf            |
| Subcatchment SC4.1: | Runoff Area=4,504 sf 4.43% Impervious Runoff Depth=0.00"<br>Flow Length=64' Tc=5.0 min CN=74 Runoff=0.0 cfs 0 cf                |
| Subcatchment SC4.2: | Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>0.02"<br>Flow Length=75' Tc=12.7 min CN=86 Runoff=0.0 cfs 14 cf            |
| Pond CB1:           | Peak Elev=298.07' Inflow=0.0 cfs 58 cf<br>12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.0 cfs 58 cf               |
| Pond CB2:           | Peak Elev=288.31' Inflow=0.0 cfs 120 cf<br>12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.0 cfs 120 cf               |

Five Paths, Tax Map 39, Parcel 15A, Wayland, MA NRCC 24-hr D 0.5 Inch Rainfall=0.50" Post-Dev Rev 2 Prepared by Goldsmith, Prest & Ringwall, Inc. Printed 7/14/2020 HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLC Page 4 Peak Elev=287.00' Storage=0 cf Inflow=0.0 cfs 0 cf Pond DCB3: 24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=0.0 cfs 0 cf Peak Elev=287.00' Storage=0 cf Inflow=0.0 cfs 0 cf Pond DCB4: 15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.0 cfs 0 cf Peak Elev=297.42' Inflow=0.0 cfs 0 cf Pond DCB5: 21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=0.0 cfs 0 cf Peak Elev=297.02' Inflow=0.0 cfs 17 cf Pond DCB6: 21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.0 cfs 17 cf Peak Elev=297.01' Inflow=0.0 cfs 0 cf Pond DCB7: 18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.0 cfs 0 cf Peak Elev=287.11' Inflow=0.1 cfs 179 cf Pond DMH1: 24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=0.1 cfs 179 cf Pond DMH2: Peak Elev=296.86' Inflow=0.0 cfs 17 cf 30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.0 cfs 17 cf Peak Elev=282.40' Storage=0 cf Inflow=0.1 cfs 179 cf Pond IC-1: Discarded=0.1 cfs 179 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 179 cf Peak Elev=295.80' Storage=0 cf Inflow=0.0 cfs 17 cf Pond IC-2: Discarded=0.0 cfs 17 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 17 cf Peak Elev=300.00' Storage=0 cf Inflow=0.0 cfs 3 cf Pond SD-1: Discarded=0.0 cfs 3 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 3 cf Peak Elev=302.50' Storage=0 cf Inflow=0.0 cfs 0 cf Pond SD-2: Discarded=0.0 cfs 0 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 0 cf Inflow=0.0 cfs 16 cf Link AP1: Primary=0.0 cfs 16 cf Inflow=0.0 cfs 0 cf Link AP2: Primary=0.0 cfs 0 cf Inflow=0.0 cfs 0 cf Link AP3: Primary=0.0 cfs 0 cf

> Total Runoff Area = 478,286 sf Runoff Volume = 230 cf Average Runoff Depth = 0.01" 88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

Link AP4:

Inflow=0.0 cfs 14 cf

Primary=0.0 cfs 14 cf

## Summary for Subcatchment SC1.1:

| - <i>"</i> |   |           |                   |                    |
|------------|---|-----------|-------------------|--------------------|
| Runoff     | = | 0.0 cfs @ | 0.00 hrs, Volume= | 0 cf, Depth= 0.00" |

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| _ | A     | rea (sf) | CN      | Description                      |              |                                    |  |  |  |
|---|-------|----------|---------|----------------------------------|--------------|------------------------------------|--|--|--|
|   |       | 24,785   | 74 :    | 74 >75% Grass cover, Good, HSG C |              |                                    |  |  |  |
|   |       | 21,721   | 70      | Woods, Go                        | od, HSG C    |                                    |  |  |  |
|   |       | 14       | 89      | Gravel road                      | ls, HSG C    |                                    |  |  |  |
|   |       | 6,226    | 98      | Paved park                       | ing, HSG C   |                                    |  |  |  |
| _ |       | 1,776    | 98      | Roofs, HSC                       | S Č          |                                    |  |  |  |
|   |       | 54,522   | 76      | Weighted A                       | verage       |                                    |  |  |  |
|   |       | 46,520   | 1       | 85.32% Per                       | vious Area   |                                    |  |  |  |
|   |       | 8,002    |         | 14.68% Imp                       | pervious Are | ea                                 |  |  |  |
|   |       |          |         |                                  |              |                                    |  |  |  |
|   | Тс    | Length   | Slope   | Velocity                         | Capacity     | Description                        |  |  |  |
| _ | (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                    |  |  |  |
|   | 0.9   | 50       | 0.0100  | 0.90                             |              | Sheet Flow,                        |  |  |  |
|   |       |          |         |                                  |              | Smooth surfaces n= 0.011 P2= 3.16" |  |  |  |
|   | 0.2   | 35       | 0.0200  | 2.87                             |              | Shallow Concentrated Flow,         |  |  |  |
|   |       |          |         |                                  |              | Paved Kv= 20.3 fps                 |  |  |  |
|   | 0.6   | 50       | 0.0345  | 1.30                             |              | Shallow Concentrated Flow,         |  |  |  |
|   |       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |
|   | 1.5   | 180      | 0.1550  | 1.97                             |              | Shallow Concentrated Flow,         |  |  |  |
|   |       | 004      | 0.0470  |                                  |              | Woodland Kv= 5.0 fps               |  |  |  |
|   | 4.3   | 234      | 0.0170  | 0.91                             |              | Shallow Concentrated Flow,         |  |  |  |
| _ |       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 tps    |  |  |  |
|   | 7.5   | 549      | Total   |                                  |              |                                    |  |  |  |

## **Summary for Subcatchment SC1.2:**

| Runoff | = | 0.0 cfs @ | 0.00 hrs, | Volume= | 0 cf, Depth= 0.00" |
|--------|---|-----------|-----------|---------|--------------------|
|        |   | <u> </u>  |           |         |                    |

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 46,703    | 74 | >75% Grass cover, Good, HSG C |
| 57,729    | 70 | Woods, Good, HSG C            |
| 967       | 89 | Gravel roads, HSG C           |
| 313       | 98 | Unconnected pavement, HSG C   |
| 7,362     | 98 | Paved parking, HSG C          |
| 2,449     | 98 | Roofs, HSG C                  |
| 115,523   | 74 | Weighted Average              |
| 105,398   |    | 91.24% Pervious Area          |
| 10,124    |    | 8.76% Impervious Area         |
| 313       |    | 3.09% Unconnected             |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                     |
|-------------|------------------|------------------|----------------------|-------------------|---------------------------------|
| 3.6         | 50               | 0.0600           | 0.23                 |                   | Sheet Flow,                     |
|             |                  |                  |                      |                   | Grass: Short n= 0.150 P2= 3.16" |
| 1.3         | 167              | 0.0988           | 2.20                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 0.8         | 117              | 0.1200           | 2.42                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 1.0         | 176              | 0.0400           | 3.00                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Grassed Waterway Kv= 15.0 fps   |
| 6.7         | 510              | Total            |                      |                   |                                 |

# Summary for Subcatchment SC1.3:

| Runoff | = | 0.0 cfs @ | 12.12 hrs, | Volume= | 120 cf, Depth> | 0.26" |
|--------|---|-----------|------------|---------|----------------|-------|
|        |   |           | ,          |         | ,              |       |

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| A           | rea (sf)         | CN              | Description            |                               |              |  |  |  |
|-------------|------------------|-----------------|------------------------|-------------------------------|--------------|--|--|--|
|             | 162              | 74              | >75% Gras              | ▶75% Grass cover, Good, HSG C |              |  |  |  |
|             | 243              | 89              | Gravel road            | ls, HSG C                     |              |  |  |  |
|             | 5,233            | 98              | Paved parking, HSG C   |                               |              |  |  |  |
|             | 5,639            | 97              | Weighted Average       |                               |              |  |  |  |
|             | 405              |                 | 7.19% Pervious Area    |                               |              |  |  |  |
|             | 5,233            |                 | 92.81% Impervious Area |                               |              |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft | e Velocity             | Capacity                      | Description  |  |  |  |
| 5.0         | (1001)           | (1010           | (14000)                | (010)                         | Direct Entry |  |  |  |
| 0.0         |                  |                 |                        |                               | Broot Entry, |  |  |  |
|             |                  |                 | •                      | -                             |              |  |  |  |

## Summary for Subcatchment SC1.4:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 58 cf, Depth> 0.32"

| Α           | rea (sf)         | CN               | N Description           |                   |               |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|---------------|--|--|
|             | 2,208            | 98               | 98 Paved parking, HSG C |                   |               |  |  |
|             | 2,208            |                  | 100.00% Impervious Area |                   |               |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description   |  |  |
| 5.0         |                  |                  |                         |                   | Direct Entry, |  |  |

## Summary for Subcatchment SC1.5:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| A        | rea (sf) | CN      | Description        |             |                                 |  |  |  |
|----------|----------|---------|--------------------|-------------|---------------------------------|--|--|--|
|          | 37,139   | 70      | Woods, Good, HSG C |             |                                 |  |  |  |
|          | 441      | 98      | Unconnecte         | ed pavemer  | nt, HSG C                       |  |  |  |
|          | 8,658    | 74 :    | >75% Gras          | s cover, Go | bod, HSG C                      |  |  |  |
|          | 46,238   | 71      | Weighted A         | verage      |                                 |  |  |  |
|          | 45,797   | 9       | 99.05% Pei         | vious Area  |                                 |  |  |  |
|          | 441      | (       | 0.95% Impe         | ervious Are | a                               |  |  |  |
|          | 441      |         | 100.00% Ui         | nconnected  | 1                               |  |  |  |
|          |          |         |                    |             |                                 |  |  |  |
| Тс       | Length   | Slope   | Velocity           | Capacity    | Description                     |  |  |  |
| (min)    | (feet)   | (ft/ft) | (ft/sec)           | (cfs)       |                                 |  |  |  |
| 3.3      | 50       | 0.0800  | 0.26               |             | Sheet Flow,                     |  |  |  |
|          |          |         |                    |             | Grass: Short n= 0.150 P2= 3.16" |  |  |  |
| 3.1      | 287      | 0.0941  | 1.53               |             | Shallow Concentrated Flow,      |  |  |  |
|          |          |         |                    |             | Woodland Kv= 5.0 fps            |  |  |  |
| <u> </u> | 007      | Tatal   |                    |             |                                 |  |  |  |

6.4 337 Total

## Summary for Subcatchment SC1.6:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 16 cf, Depth> 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| Area (sf)                 | CN            | Description               |                   |               |  |  |
|---------------------------|---------------|---------------------------|-------------------|---------------|--|--|
| 622                       | 98            | 98 Paved parking, HSG C   |                   |               |  |  |
| 622                       |               | 100.00% In                | npervious A       | vrea          |  |  |
| Tc Length<br>(min) (feet) | Slop<br>(ft/1 | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs) | Description   |  |  |
| 5.0                       |               |                           |                   | Direct Entry, |  |  |

## Summary for Subcatchment SC2.1:

Runoff = 0.0 cfs @ 16.53 hrs, Volume= 3 cf, Depth> 0.01"

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Area (sf)

CN

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Description

|          | 1,953                           | 74 >      | 75% Gras   | s cover, Go          | ood, HSG C                                      |  |  |
|----------|---------------------------------|-----------|------------|----------------------|---|--|--|
|          | 1,770                           | 98 H      | KOOTS, HSG |                      |   |  |  |
|          | 3,729<br>1 053                  | 85 V<br>5 | 2 37% Por  | verage<br>vious Area |   |  |  |
|          | 1,333                           | 4         | 7 63% Imr  | ervious Are          | ea  |  |  |
|          | 1,110                           |           | 1.00/0 111 |                      |   |  |  |
| Тс       | Length                          | Slope     | Velocity   | Capacity             | Description                                     |  |  |
| (min)    | (feet)                          | (ft/ft)   | (ft/sec)   | (cfs)                |   |  |  |
| 4.3      | 50                              | 0.0400    | 0.19       |                      | Sheet Flow,                                     |  |  |
|          |                                 |           |            |                      | Grass: Short n= 0.150 P2= 3.16"                 |  |  |
| 0.2      | 18                              | 0.0300    | 1.21       |                      | Shallow Concentrated Flow,                      |  |  |
|          |                                 |           |            | <u> </u>             | Short Grass Pasture Kv= 7.0 fps                 |  |  |
| 4.5      | 68                              | lotal, l  | ncreased t | o minimum            | Ic = 5.0 min                                    |  |  |
|          |                                 |           | Sum        | mary for             | Subcatchmont SC2 2:                             |  |  |
|          | Summary for Subcatchment SC2.2. |           |            |                      |   |  |  |
| Runoff   | =                               | 0.0 c     | fs@ 0.0    | 0 hrs, Volu          | ume= 0 cf, Depth= 0.00"                         |  |  |
|          |                                 |           |            |                      |   |  |  |
| Runoff b | y SCS TF                        | R-20 meth | hod, UH=S  | CS, Weigh            | ted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs |  |  |
| NRUU Z   | 4-nr D 0.                       | 5 Inch Ra | amaii=0.50 | J                    |   |  |  |
| A        | rea (sf)                        | CN A      | Adj Desc   | ription              |   |  |  |
|          | 7,180                           | 74        | >75%       | 6 Grass co           | ver, Good, HSG C                                |  |  |
|          | 22,269                          | 70        | Woo        | ds, Good, H          | HSG C   |  |  |
|          | 8,992                           | 98        | Unco       | onnected pa          | avement, HSG C                                  |  |  |
|          | 38,441                          | 77        | 74 Weig    | hted Avera           | age, UI Adjusted                                |  |  |
|          | 29,449                          |           | 76.6       | 1% Perviou           | is Area   |  |  |
|          | 8,992                           |           | 23.39      | 9% Impervi           | ous Area  |  |  |
|          | 8,992                           |           | 100.0      | J0% Uncon            | inected   |  |  |
| Тс       | l enath                         | Slope     | Velocity   | Capacity             | Description                                     |  |  |
| (min)    | (feet)                          | (ft/ft)   | (ft/sec)   | (cfs)                |   |  |  |
| 5.7      | 50                              | 0.0200    | 0.15       |                      | Sheet Flow,                                     |  |  |
|          |                                 |           |            |                      | Grass: Short n= 0.150 P2= 3.16"                 |  |  |
| 0.2      | 29                              | 0.1700    | 2.89       |                      | Shallow Concentrated Flow,                      |  |  |
|          |                                 |           |            |                      | Short Grass Pasture Kv= 7.0 fps                 |  |  |
| 0.5      | 61                              | 0.1800    | 2.12       |                      | Shallow Concentrated Flow,                      |  |  |

6.4 140 Total

# Summary for Subcatchment SC3.1:

Woodland Kv= 5.0 fps

Runoff = 0.0 cfs @ 0.00 hrs, Volume=

0 cf, Depth= 0.00"

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| A     | rea (sf) | CN I    | Description                      |              |                                 |  |  |  |
|-------|----------|---------|----------------------------------|--------------|---------------------------------|--|--|--|
|       | 32,168   | 74 :    | 74 >75% Grass cover, Good, HSG C |              |                                 |  |  |  |
|       | 31,971   | 70      | Noods, Go                        | od, HSG C    |                                 |  |  |  |
|       | 364      | 89 (    | Gravel road                      | ls, HSG C    |                                 |  |  |  |
|       | 55       | 98 I    | Paved park                       | ing, HSG C   |                                 |  |  |  |
|       | 2,321    | 98      | Roofs, HSC                       | G C          |                                 |  |  |  |
|       | 66,880   | 73      | Neighted A                       | verage       |                                 |  |  |  |
|       | 64,504   | ę       | 96.45% Pei                       | vious Area   |                                 |  |  |  |
|       | 2,376    |         | 3.55% Impe                       | ervious Area | a                               |  |  |  |
| _     |          |         |                                  | _            |                                 |  |  |  |
| Tc    | Length   | Slope   | Velocity                         | Capacity     | Description                     |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                 |  |  |  |
| 5.7   | 50       | 0.0200  | 0.15                             |              | Sheet Flow,                     |  |  |  |
|       |          |         |                                  |              | Grass: Short n= 0.150 P2= 3.16" |  |  |  |
| 2.1   | 247      | 0.0800  | 1.98                             |              | Shallow Concentrated Flow,      |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps |  |  |  |
| 1.5   | 133      | 0.0830  | 1.44                             |              | Shallow Concentrated Flow,      |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps            |  |  |  |
| 1.1   | 134      | 0.0820  | 2.00                             |              | Shallow Concentrated Flow,      |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps |  |  |  |

10.4 564 Total

# Summary for Subcatchment SC3.2:

| Runoff = 0.0 cfs @ 0.00 hrs, Volume= |  |
|--------------------------------------|--|
|--------------------------------------|--|

0 cf, Depth= 0.00"

| <br>A     | rea (sf) | CN                               | Description |              |  |  |  |
|-----------|----------|----------------------------------|-------------|--------------|--|--|--|
|           | 12,832   | 74 >75% Grass cover, Good, HSG C |             |              |  |  |  |
|           | 880      | 98                               | Roofs, HSG  | ЭС           |  |  |  |
|           | 41,349   | 70                               | Noods, Go   | od, HSG C    |  |  |  |
|           | 55,060   | 71                               | Neighted A  | verage       |  |  |  |
|           | 54,180   | 9                                | 98.40% Pei  | vious Area   |  |  |  |
|           | 880      |                                  | 1.60% Impe  | ervious Area | а  |  |  |
|           |          |                                  |             |              |  |  |  |
| Тс        | Length   | Slope                            | Velocity    | Capacity     | Description                                |  |  |
| <br>(min) | (feet)   | (ft/ft)                          | (ft/sec)    | (cfs)        |  |  |  |
| 7.1       | 50       | 0.0800                           | 0.12        |              | Sheet Flow,                                |  |  |
|           |          |                                  |             |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |
| 1.7       | 204      | 0.1600                           | 2.00        |              | Shallow Concentrated Flow,                 |  |  |
|           |          |                                  |             |              | Woodland Kv= 5.0 fps                       |  |  |
| 1.3       | 124      | 0.0530                           | 1.61        |              | Shallow Concentrated Flow,                 |  |  |
|           |          |                                  |             |              | Short Grass Pasture Kv= 7.0 fps            |  |  |
| 10.1      | 378      | Total                            |             |              |  |  |  |

# Summary for Subcatchment SC3.3:

| Runoff = $0.0 \text{ cfs} (@ 0.00 \text{ hrs}, \text{ Volume} = 0 \text{ cf}, \text{ Deptn} = 0.0 \text{ cf}$ | Runoff | = 0.0 cfs @ | 0.00 hrs, Volume= | 0 cf, Depth= 0.00" |
|---|--------|-------------|-------------------|--------------------|
|---|--------|-------------|-------------------|--------------------|

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| A           | rea (sf)         | CN [                | Description                      |                   |   |  |  |  |  |
|-------------|------------------|---------------------|----------------------------------|-------------------|---|--|--|--|--|
|             | 12,393           | 74 >                | 74 >75% Grass cover, Good, HSG C |                   |   |  |  |  |  |
|             | 49,047           | 70 \                | Voods, Go                        | od, HSG C         |   |  |  |  |  |
|             | 1,019            | 98 l                | Jnconnecte                       | ed pavemer        | nt, HSG C   |  |  |  |  |
|             | 62,459           | 71 \                | Veighted A                       | verage            |   |  |  |  |  |
|             | 61,440           | ę                   | 98.37% Pei                       | vious Area        |   |  |  |  |  |
|             | 1,019            |                     | l.63% Impe                       | ervious Area      | а   |  |  |  |  |
|             | 1,019            | 100.00% Unconnected |                                  |                   |   |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft)    | Velocity<br>(ft/sec)             | Capacity<br>(cfs) | Description   |  |  |  |  |
| 8.6         | 50               | 0.0500              | 0.10                             |                   | Sheet Flow,   |  |  |  |  |
| 2.2         | 237              | 0.1350              | 1.84                             |                   | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |  |  |  |  |
| 10.8        | 287              | Total               |                                  |                   |   |  |  |  |  |

## Summary for Subcatchment SC3.4:

Runoff = 0.0 cfs @ 14.24 hrs, Volume=

17 cf, Depth> 0.02"

| A     | rea (sf) | CN [    | Description                      |              |                                    |  |  |
|-------|----------|---------|----------------------------------|--------------|------------------------------------|--|--|
|       | 5,554    | 74 >    | 74 >75% Grass cover, Good, HSG C |              |                                    |  |  |
|       | 529      | 70 \    | Noods, Go                        | od, HSG C    |                                    |  |  |
|       | 76       | 89 (    | Gravel road                      | ls, HSG C    |                                    |  |  |
|       | 6,187    | 98 F    | Paved park                       | ing, HSG C   |                                    |  |  |
|       | 12,347   | 86 \    | Neighted A                       | verage       |                                    |  |  |
|       | 6,159    | 2       | 19.89% Pei                       | vious Area   |                                    |  |  |
|       | 6,187    | Ę       | 50.11% Imp                       | pervious Are | ea                                 |  |  |
|       |          |         |                                  |              |                                    |  |  |
| Tc    | Length   | Slope   | Velocity                         | Capacity     | Description                        |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                    |  |  |
| 1.3   | 113      | 0.0200  | 1.40                             |              | Sheet Flow,                        |  |  |
|       |          |         |                                  |              | Smooth surfaces n= 0.011 P2= 3.16" |  |  |
| 2.4   | 38       | 0.1000  | 0.27                             |              | Sheet Flow,                        |  |  |
|       |          |         |                                  |              | Grass: Short n= 0.150 P2= 3.16"    |  |  |
| 0.9   | 95       | 0.0600  | 1.71                             |              | Shallow Concentrated Flow,         |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |
| 4.6   | 246      | Total,  | Increased t                      | o minimum    | Tc = 5.0 min                       |  |  |

## Summary for Subcatchment SC4.1:

Runoff = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 0.5 Inch Rainfall=0.50"

| A     | rea (sf) | CN      | Description           |             |                                 |  |  |  |
|-------|----------|---------|-----------------------|-------------|---------------------------------|--|--|--|
|       | 1,020    | 70      | 70 Woods, Good, HSG C |             |                                 |  |  |  |
|       | 200      | 98      | Unconnecte            | ed pavemer  | nt, HSG C                       |  |  |  |
|       | 3,285    | 74      | >75% Gras             | s cover, Go | bod, HSG C                      |  |  |  |
|       | 4,504    | 74      | Weighted A            | verage      |                                 |  |  |  |
|       | 4,305    |         | 95.57% Pei            | vious Area  |                                 |  |  |  |
|       | 200      |         | 4.43% Impervious Area |             |                                 |  |  |  |
|       | 200      |         | 100.00% Ü             | nconnected  | 1                               |  |  |  |
|       |          |         |                       |             |                                 |  |  |  |
| Tc    | Length   | Slope   | Velocity              | Capacity    | Description                     |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)              | (cfs)       |                                 |  |  |  |
| 3.6   | 50       | 0.0600  | 0.23                  |             | Sheet Flow,                     |  |  |  |
|       |          |         |                       |             | Grass: Short n= 0.150 P2= 3.16" |  |  |  |
| 0.2   | 14       | 0.0400  | 1.40                  |             | Shallow Concentrated Flow,      |  |  |  |
|       |          |         |                       |             | Short Grass Pasture Kv= 7.0 fps |  |  |  |
| 3.8   | 64       | Total,  | Increased t           | o minimum   | Tc = 5.0 min                    |  |  |  |

## **Summary for Subcatchment SC4.2:**

Runoff = 0.0 cfs @ 14.38 hrs, Volume= 14 cf, Depth> 0.02"

| A     | rea (sf) | CN [    | Description           |              |  |  |  |  |
|-------|----------|---------|-----------------------|--------------|--|--|--|--|
|       | 3,927    | 70 \    | 70 Woods, Good, HSG C |              |  |  |  |  |
|       | 5,854    | 98 l    | Jnconnecte            | ed pavemer   | nt, HSG C                                  |  |  |  |
|       | 333      | 74 >    | <u>&gt;75% Gras</u>   | s cover, Go  | ood, HSG C                                 |  |  |  |
|       | 10,114   | 86 \    | Veighted A            | verage       |  |  |  |  |
|       | 4,260    | 2       | 2.12% Pe              | vious Area   |  |  |  |  |
|       | 5,854    | Ę       | 57.88% Imp            | pervious Are | ea   |  |  |  |
|       | 5,854    |         | 100.00% Unconnected   |              |  |  |  |  |
| _     |          |         |                       | _            |  |  |  |  |
| Tc    | Length   | Slope   | Velocity              | Capacity     | Description                                |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)              | (cfs)        |  |  |  |  |
| 12.4  | 50       | 0.0200  | 0.07                  |              | Sheet Flow,                                |  |  |  |
|       |          |         |                       |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |
| 0.3   | 25       | 0.0800  | 1.41                  |              | Shallow Concentrated Flow,                 |  |  |  |
|       |          |         |                       |              | Woodland Kv= 5.0 fps                       |  |  |  |
| 12.7  | 75       | Total   |                       |              |  |  |  |  |
|       |          |         |                       |              |  |  |  |  |

## Summary for Pond CB1:

| Inflow Area | . = | 2,208 sf,1 | 100.00% Im | pervious, | Inflow Depth > | 0.32"    | for 0.5 Inch event   |
|-------------|-----|------------|------------|-----------|----------------|----------|----------------------|
| Inflow      | =   | 0.0 cfs @  | 12.12 hrs, | Volume=   | 58             | cf       |                      |
| Outflow     | =   | 0.0 cfs @  | 12.12 hrs, | Volume=   | 58             | cf, Atte | en= 0%, Lag= 0.0 min |
| Primary     | =   | 0.0 cfs @  | 12.12 hrs, | Volume=   | 58             | cf       | -                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.07' @ 12.12 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 298.00' | <b>12.0" Round Culvert</b><br>L= 220.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=298.07' TW=287.11' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 0.0 cfs @ 0.72 fps)

## Summary for Pond CB2:

| Inflow Are | ea = | 5,639 sf, | 92.81% Impervious, | Inflow Depth > | 0.26"    | for 0.5 Inch event  |
|------------|------|-----------|--------------------|----------------|----------|---------------------|
| Inflow     | =    | 0.0 cfs @ | 12.12 hrs, Volume= | 120 c          | f        |                     |
| Outflow    | =    | 0.0 cfs @ | 12.12 hrs, Volume= | 120 c          | f, Atter | n= 0%, Lag= 0.0 min |
| Primary    | =    | 0.0 cfs @ | 12.12 hrs, Volume= | 120 c          | f        | -                   |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.31' @ 12.12 hrs Flood Elev= 292.30'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 288.20' | 12.0" Round Culvert  |
|        |         |         | L= 5.0' CPP, projecting, no headwall, Ke= 0.900                  |
|        |         |         | Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf      |

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=288.31' TW=287.11' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 0.0 cfs @ 0.87 fps)

## Summary for Pond DCB3:

| Inflow Area | a = | 115,523 sf, | 8.76% Impervious, | Inflow Depth = $0.0$ | 0" for 0.5 Inch event   |
|-------------|-----|-------------|-------------------|----------------------|-------------------------|
| Inflow      | =   | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf                 |                         |
| Outflow     | =   | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf, <i>1</i>       | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf                 |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 287.00' @ 0.00 hrs Surf.Area= 1 sf Storage= 0 cf Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow) Center-of-Mass det. time= (not calculated: no inflow)

| Volume           | Inv       | ert Avai             | I.Storage        | Storage Description       | on                        |                             |      |
|------------------|-----------|----------------------|------------------|---------------------------|---------------------------|-----------------------------|------|
| #1               | 287.      | 00'                  | 310 cf           | Custom Stage Da           | ata (Irregular)Liste      | ed below (Recalc)           |      |
| Elevatio<br>(fee | on<br>et) | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |      |
| 287.0            | 00        | 1                    | 1.0              | 0                         | 0                         | 1                           |      |
| 288.0            | 00        | 1                    | 1.0              | 1                         | 1                         | 2                           |      |
| 289.0            | 00        | 1                    | 1.0              | 1                         | 2                         | 3                           |      |
| 290.0            | 00        | 1                    | 1.0              | 1                         | 3                         | 4                           |      |
| 291.0            | 00        | 89                   | 87.5             | 33                        | 36                        | 615                         |      |
| 292.0            | 00        | 519                  | 180.8            | 274                       | 310                       | 2,611                       |      |
| Device           | Routing   | In                   | vert Outle       | et Devices                |                           |                             |      |
| #1               | Primary   | 287                  | .34' <b>24.0</b> | " Round Culvert           |                           |                             |      |
|                  |           |                      | L= 1             | 2.0' CPP, projectir       | ng, no headwall, I        | Ke= 0.900                   |      |
|                  |           |                      | Inlet            | / Outlet Invert= 287      | 7.34'/287.10' S=          | = 0.0200 '/' Cc= 0          | .900 |
|                  |           |                      | n= 0             | .013 Corrugated P         | E, smooth interior        | , Flow Area= 3.14           | 1 sf |

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=287.00' TW=287.00' (Dynamic Tailwater)

## Summary for Pond DCB4:

| Inflow Area | a = | 54,522 sf, | 14.68% Impervious, | Inflow Depth = 0.00" | for 0.5 Inch event  |
|-------------|-----|------------|--------------------|----------------------|---------------------|
| Inflow      | =   | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf                 |                     |
| Outflow     | =   | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf, Atte           | n= 0%, Lag= 0.0 min |
| Primary     | =   | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf                 | •                   |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.00' @ 0.00 hrs Surf.Area= 1 sf Storage= 0 cf Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow) Center-of-Mass det. time= (not calculated: no inflow)

| Volume              | Invert    | Avail            | .Storage         | Storage Description       |                           |                             |
|---------------------|-----------|------------------|------------------|---------------------------|---------------------------|-----------------------------|
| #1                  | 287.00'   |                  | 250 cf           | Custom Stage Data         | a (Irregular)Listed       | l below (Recalc)            |
| Elevation<br>(feet) | Surf<br>( | .Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
| 287.00              |           | 1                | 1.0              | 0                         | 0                         | 1                           |
| 288.00              |           | 1                | 1.0              | 1                         | 1                         | 2                           |
| 289.00              |           | 1                | 1.0              | 1                         | 2                         | 3                           |
| 290.00              |           | 1                | 1.0              | 1                         | 3                         | 4                           |
| 291.00              |           | 714              | 132.0            | 247                       | 250                       | 1,392                       |

| #1 Primary 287.25' <b>15.0" Round Culvert</b><br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900 | Device | Routing | Invert  | Outlet Devices  |
|---|--------|---------|---------|---|
| n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf                                       | #1     | Primary | 287.25' | <b>15.0" Round Culvert</b><br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=0.0 cfs @ 0.00 hrs HW=287.00' TW=282.40' (Dynamic Tailwater) **1=Culvert** (Controls 0.0 cfs)

## Summary for Pond DCB5:

| Inflow Area | = | 66,880 sf, | 3.55% Impervious, | Inflow Depth = | 0.00"     | for 0.5 Inch event  |
|-------------|---|------------|-------------------|----------------|-----------|---------------------|
| Inflow      | = | 0.0 cfs @  | 0.00 hrs, Volume= | . 0            | cf        |                     |
| Outflow     | = | 0.0 cfs @  | 0.00 hrs, Volume= | 0              | cf, Atter | n= 0%, Lag= 0.0 min |
| Primary     | = | 0.0 cfs @  | 0.00 hrs, Volume= | 0              | cf        | -                   |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 297.42' @ 0.00 hrs Flood Elev= 302.50'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.42' | 21.0" Round Culvert  |
|        |         |         | L= 47.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |         |         | Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf      |

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=297.42' TW=296.85' (Dynamic Tailwater)

# **Summary for Pond DCB6:**

| Inflow Are | a = | 12,347 sf, | 50.11% Impervious, | Inflow Depth > | 0.02" for 0.5 Inc | h event    |
|------------|-----|------------|--------------------|----------------|-------------------|------------|
| Inflow     | =   | 0.0 cfs @  | 14.24 hrs, Volume= | 17 ct          | -                 |            |
| Outflow    | =   | 0.0 cfs @  | 14.24 hrs, Volume= | 17 ct          | f, Atten= 0%, Lag | g= 0.0 min |
| Primary    | =   | 0.0 cfs @  | 14.24 hrs, Volume= | 17 ct          | -                 | -          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 297.02' @ 14.24 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>21.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |

Primary OutFlow Max=0.0 cfs @ 14.24 hrs HW=297.02' TW=296.86' (Dynamic Tailwater) -1=Culvert (Barrel Controls 0.0 cfs @ 0.36 fps)

## Summary for Pond DCB7:

| Inflow Are | a = | 55,060 sf, | 1.60% Impervious, | Inflow Depth = | 0.00" for 0.5 Inch event   |
|------------|-----|------------|-------------------|----------------|----------------------------|
| Inflow     | =   | 0.0 cfs @  | 0.00 hrs, Volume= | 0 c            | f                          |
| Outflow    | =   | 0.0 cfs @  | 0.00 hrs, Volume= | 0 c            | f, Atten= 0%, Lag= 0.0 min |
| Primary    | =   | 0.0 cfs @  | 0.00 hrs, Volume= | 0 c            | f                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 297.01' @ 0.00 hrs Flood Elev= 302.70'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>18.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=297.01' TW=295.80' (Dynamic Tailwater)

## Summary for Pond DMH1:

| Inflow Area = |   | 123,370 sf, | 14.24% Impervious, | Inflow Depth > | 0.02" f   | or 0.5 Inch event |
|---------------|---|-------------|--------------------|----------------|-----------|-------------------|
| Inflow        | = | 0.1 cfs @   | 12.12 hrs, Volume= | 179 c          | f         |                   |
| Outflow       | = | 0.1 cfs @   | 12.12 hrs, Volume= | 179 c          | f, Atten= | 0%, Lag= 0.0 min  |
| Primary       | = | 0.1 cfs @   | 12.12 hrs, Volume= | 179 c          | f         |                   |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.11' @ 12.12 hrs Flood Elev= 292.00'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.00' | <b>24.0" Round Culvert</b><br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=287.11' TW=282.40' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 0.1 cfs @ 0.88 fps)

## **Summary for Pond DMH2:**

| Inflow Area = |   | 79,226 sf, | 10.81% Impervious, | Inflow Depth > 0.00" | for 0.5 Inch event   |
|---------------|---|------------|--------------------|----------------------|----------------------|
| Inflow        | = | 0.0 cfs @  | 14.24 hrs, Volume= | 17 cf                |                      |
| Outflow       | = | 0.0 cfs @  | 14.24 hrs, Volume= | 17 cf, Att           | en= 0%, Lag= 0.0 min |
| Primary       | = | 0.0 cfs @  | 14.24 hrs, Volume= | 17 cf                | -                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

## Post-Dev Rev 2

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Peak Elev= 296.86' @ 14.24 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 296.85' | <b>30.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf |

Primary OutFlow Max=0.0 cfs @ 14.24 hrs HW=296.86' TW=295.80' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 0.0 cfs @ 0.34 fps)

## Summary for Pond IC-1:

| Inflow Area | a = | 177,892 sf, | 14.37% Impervious, | Inflow Depth > 0.01 | for 0.5 Inch event    |
|-------------|-----|-------------|--------------------|---------------------|-----------------------|
| Inflow      | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 179 cf              |                       |
| Outflow     | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 179 cf, At          | ten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 179 cf              |                       |
| Primary     | =   | 0.0 cfs @   | 0.00 hrs, Volume=  | 0 cf                |                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 282.40' @ 12.12 hrs Surf.Area= 2,021 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= (not calculated: outflow precedes inflow)

| Volume | Invert  | Avail.Storage | Storage Description   |
|--------|---------|---------------|---|
| #1     | 282.40' | 3,658 cf      | IC-1 Stone bed (Irregular)Listed below (Recalc)                 |
|        |         |               | 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids  |
| #2     | 283.40' | 5,002 cf      | ADS_StormTech MC-4500 b +Cap x 44 Inside #1                     |
|        |         |               | Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf |
|        |         |               | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap      |
|        |         |               | 44 Chambers in 4 Rows   |
|        |         |               | Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf                   |
| #3     | 283.00' | 200 cf        | PES-1 Stone bed (Pyramidal)Listed below (Recalc)                |
|        |         |               | 625 cf Overall - 126 cf Embedded = 499 cf $\times$ 40.0% Voids  |
| #4     | 283.00' | 126 cf        | 24.0" Round Pipe Storage Inside #3                              |
|        |         |               | L= 40.0'  |

| Elevation | Surf.Area | Perim. | Inc.Store    | Cum.Store    | Wet.Area |
|-----------|-----------|--------|--------------|--------------|----------|
| (feet)    | (sq-ft)   | (feet) | (cubic-feet) | (cubic-feet) | (sq-ft)  |
| 282.40    | 2,021     | 188.0  | 0            | 0            | 2,021    |
| 283.00    | 2,021     | 188.0  | 1,213        | 1,213        | 2,134    |
| 284.00    | 2,021     | 188.0  | 2,021        | 3,234        | 2,322    |
| 285.00    | 2,021     | 188.0  | 2,021        | 5,255        | 2,510    |
| 286.00    | 2,021     | 188.0  | 2,021        | 7,276        | 2,698    |
| 287.00    | 2,021     | 188.0  | 2,021        | 9,297        | 2,886    |
| 288.00    | 2,021     | 188.0  | 2,021        | 11,318       | 3,074    |
| 289.00    | 2,021     | 188.0  | 2,021        | 13,339       | 3,262    |
| 289.40    | 2,021     | 188.0  | 808          | 14,147       | 3,337    |
|           |           |        |              |              |          |

8,985 cf Total Available Storage
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|----|-----------|
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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|---------------------------|---------------------------|-----------------------------|
| 283.00              | 250                  | 0                         | 0                         | 250                         |
| 284.00              | 250                  | 250                       | 250                       | 313                         |
| 285.00              | 250                  | 250                       | 500                       | 376                         |
| 285.50              | 250                  | 125                       | 625                       | 408                         |

| Device | Routing   | Invert  | Outlet Devices   |
|--------|-----------|---------|--|
| #1     | Discarded | 282.40' | 2.410 in/hr Exfiltration over Surface area                       |
| #2     | Primary   | 285.50' | 50.0' long x 2.5' breadth Broad-Crested Rectangular Weir         |
|        |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|        |           |         | 2.50 3.00 3.50 4.00  |
|        |           |         | Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74     |
|        |           |         | 2.76 2.89 3.05 3.19 3.32   |
| #3     | Device 2  | 284.10' | 24.0" Round Culvert  |
|        |           |         | L= 70.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |           |         | Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 |
|        |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf      |
| #4     | Device 3  | 284.10' | 20.0" W x 12.0" H Vert. Orifice/Grate C= 0.600                   |
|        |           |         | Limited to weir flow at low heads                                |
| #5     | Device 3  | 287.00' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |

**Discarded OutFlow** Max=0.1 cfs @ 12.12 hrs HW=282.40' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=282.40' TW=0.00' (Dynamic Tailwater) **2=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

-3=Culvert (Controls 0.0 cfs)

4=Orifice/Grate (Controls 0.0 cfs) 5=Share Create it is a second second

-5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

# Summary for Pond IC-2:

| Inflow Area | ı = | 134,287 sf, | 7.03% Impe   | ervious, | Inflow Depth > | 0.0 | 00" for 0. | 5 Inch event |
|-------------|-----|-------------|--------------|----------|----------------|-----|------------|--------------|
| Inflow      | =   | 0.0 cfs @   | 14.24 hrs, V | /olume=  | 17             | cf  |            |              |
| Outflow     | =   | 0.0 cfs @   | 14.24 hrs, V | olume=   | 17             | cf, | Atten= 0%, | Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @   | 14.24 hrs, V | olume=   | 17             | cf  |            |              |
| Primary     | =   | 0.0 cfs @   | 0.00 hrs, V  | ′olume=  | 0              | cf  |            |              |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 295.80' @ 0.00 hrs Surf.Area= 1,247 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 0.0 min ( 1,085.0 - 1,085.0 )

Invert

295.80'

296.80'

296.00'

296.00'

Volume

#1

#2

#3

#4

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Avail.StorageStorage Description2,234 cfIC-2 Stone bed (Irregular)Listed below (Recalc)<br/>8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids3,143 cfADS\_StormTech MC-4500 b +Cap @ 4.03' L x 28 Inside #1<br/>Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf<br/>Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap<br/>28 Chambers in 2 Rows<br/>Cap Storage= +39.5 cf x 2 x 2 rows = 158.0 cf172 cfPES-2 Stone bed (Pyramidal)Listed below (Recalc)<br/>500 cf Overall - 71 cf Embedded = 429 cf x 40.0% Voids71 cf18.0" Round Pipe Storage Inside #3<br/>L = 40.0'5,620 cfTotal Available Storage

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |
|---------------------|----------------------|------------------|---------------------------|---------------------------|---------------------|
| 295.80              | 1,247                | 165.0            | 0                         | 0                         | 1,247               |
| 296.00              | 1,247                | 165.0            | 249                       | 249                       | 1,280               |
| 297.00              | 1,247                | 165.0            | 1,247                     | 1,496                     | 1,445               |
| 298.00              | 1,247                | 165.0            | 1,247                     | 2,743                     | 1,610               |
| 299.00              | 1,247                | 165.0            | 1,247                     | 3,990                     | 1,775               |
| 300.00              | 1,247                | 165.0            | 1,247                     | 5,237                     | 1,940               |
| 301.00              | 1,247                | 165.0            | 1,247                     | 6,484                     | 2,105               |
| 302.00              | 1,247                | 165.0            | 1,247                     | 7,731                     | 2,270               |
| 302.80              | 1,247                | 165.0            | 998                       | 8,729                     | 2,402               |
| Elevation           | Surf.Area            | Inc.Store        | e Cum.St                  | ore Wet.Ar                | ea                  |
| (feet)              | (sq-ft)              | (cubic-feet      | ) (cubic-fe               | eet) (sq                  | -ft)                |
| 296.00              | 250                  | (                | 0                         | 0 2                       | 50                  |
| 297.00              | 250                  | 250              | C C                       | 250 3                     | 13                  |
| 298.00              | 250                  | 250              | C (                       | 500 3                     | 76                  |

| Device | Routing   | Invert  | Outlet Devices  |
|--------|-----------|---------|---|
| #1     | Discarded | 295.80' | 2.410 in/hr Exfiltration over Surface area  |
| #2     | Primary   | 298.00' | <b>50.0' long x 2.0' breadth Broad-Crested Rectangular Weir</b><br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00<br>2.50 3.00 3.50  |
|        |           |         | Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32  |
| #3     | Device 2  | 296.50' | <b>18.0" Round Culvert</b><br>L= 20.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |
| #4     | Device 3  | 296.50' | <b>23.0" W x 6.0" H Vert. Orifice/Grate</b> C= 0.600<br>Limited to weir flow at low heads   |
| #5     | Device 3  | 299.90' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)  |

Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D0.5 Inch Rainfall=0.50"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 19

**Discarded OutFlow** Max=0.0 cfs @ 14.24 hrs HW=295.80' (Free Discharge) **1=Exfiltration** (Passes 0.0 cfs of 0.1 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=295.80' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.0 cfs) 3=Culvert (Controls 0.0 cfs) 4=Orifice/Grate (Controls 0.0 cfs) 5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

## Summary for Pond SD-1:

| Inflow Area | ı = | 3,729 sf, | 47.63% Impervious, | Inflow Depth > 0.01 | for 0.5 Inch event    |
|-------------|-----|-----------|--------------------|---------------------|-----------------------|
| Inflow      | =   | 0.0 cfs @ | 16.53 hrs, Volume= | 3 cf                |                       |
| Outflow     | =   | 0.0 cfs @ | 16.53 hrs, Volume= | 3 cf, At            | ten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 16.53 hrs, Volume= | 3 cf                |                       |
| Primary     | =   | 0.0 cfs @ | 0.00 hrs, Volume=  | 0 cf                |                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.00' @ 0.00 hrs Surf.Area= 109 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= (not calculated: outflow precedes inflow)

| Volume           | Invert               | Avail.S            | torage                                       | Storage Description   | on  |  |
|------------------|----------------------|--------------------|--|---|---|--|
| #1               | 300.00'              |                    | 44 cf  | Custom Stage Da<br>109 cf Overall x 4   | <b>ata (Irregular)</b> Liste<br>0.0% Voids  | ed below (Recalc)  |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)                             | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)  |
| 300.0<br>301.0   | )0<br>)0             | 109<br>109         | 113.3<br>113.3                               | 0<br>109  | 0<br>109  | 109<br>222   |
| Device           | Routing              | Inver              | t Outle                                      | et Devices  |   |  |
| #1<br>#2         | Discarded<br>Primary | 300.00<br>300.90   | 2.41<br>55.0<br>Head<br>2.50<br>Coel<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40<br>3.00 3.50 4.00 4<br>f. (English) 2.38 2.<br>2.72 2.73 2.76 2 | over Surface are    th Broad-Crester    0.60  0.80  1.00   50  5.00  5.50    54  2.69  2.68  2.6   79  2.88  3.07  3. | ea<br>d Rectangular Weir<br>1.20 1.40 1.60 1.80 2.00<br>57 2.67 2.65 2.66 2.66<br>32 |

**Discarded OutFlow** Max=0.0 cfs @ 16.53 hrs HW=300.00' (Free Discharge) **1=Exfiltration** (Passes 0.0 cfs of 0.0 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=300.00' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.0 cfs) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D0.5 Inch Rainfall=0.50"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 20

## Summary for Pond SD-2:

| Inflow Area | ı = | 4,504 sf, | 4.43% Impervious, I | nflow Depth = 0.00 | for 0.5 Inch event    |
|-------------|-----|-----------|---------------------|--------------------|-----------------------|
| Inflow      | =   | 0.0 cfs @ | 0.00 hrs, Volume=   | 0 cf               |                       |
| Outflow     | =   | 0.0 cfs @ | 0.00 hrs, Volume=   | 0 cf, At           | ten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 0.00 hrs, Volume=   | 0 cf               | -                     |
| Primary     | =   | 0.0 cfs @ | 0.00 hrs, Volume=   | 0 cf               |                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 302.50' @ 0.00 hrs Surf.Area= 40 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow) Center-of-Mass det. time= (not calculated: no inflow)

| Volume         | Invert               | Avail.St           | orage  | Storage Descriptior   | 1  |   |
|----------------|----------------------|--------------------|--|---|--|---|
| #1             | 302.50'              |                    | 16 cf  | <b>Custom Stage Dat</b><br>40 cf Overall x 40.0   | <b>a (Irregular)</b> Listed<br>)% Voids  | below (Recalc)  |
| Elevatio       | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft)   |
| 302.5<br>303.5 | 50<br>50             | 40<br>40           | 44.0<br>44.0   | 0<br>40   | 0<br>40  | 40<br>84  |
| Device         | Routing              | Invert             | t Outle  | et Devices  |  |   |
| #1<br>#2       | Discarded<br>Primary | 302.50'<br>303.40' | <b>2.41</b><br><b>20.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration of</b><br><b>long x 4.0' breadt</b><br>d (feet) 0.20 0.40 0<br>3.00 3.50 4.00 4.5<br>(English) 2.38 2.5<br>2.72 2.73 2.76 2.5 | Surface area    Broad-Crested I    .60  0.80  1.00  1.2    50  5.00  5.50    4  2.69  2.68  2.67    79  2.88  3.07  3.32 | <b>Rectangular Weir</b><br>20 1.40 1.60 1.80 2.00<br>2.67 2.65 2.66 2.66<br>2 |

**Discarded OutFlow** Max=0.0 cfs @ 0.00 hrs HW=302.50' (Free Discharge) **1=Exfiltration** (Passes 0.0 cfs of 0.0 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=302.50' TW=0.00' (Dynamic Tailwater) ←2=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

# Summary for Link AP1:

| Inflow A | Area | = | 224,752 sf, | 11.85% Impervious, | Inflow Depth > 0 | .00" for 0.5 Inch event |
|----------|------|---|-------------|--------------------|------------------|-------------------------|
| Inflow   | =    | = | 0.0 cfs @   | 12.12 hrs, Volume= | 16 cf            |                         |
| Primary  | / =  | = | 0.0 cfs @   | 12.12 hrs, Volume= | 16 cf,           | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

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# Summary for Link AP2:

| Inflow Are | ea = | 42,170 sf, | 25.53% Impervious, | Inflow Depth = 0.00" | for 0.5 Inch event  |
|------------|------|------------|--------------------|----------------------|---------------------|
| Inflow     | =    | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf                 |                     |
| Primary    | =    | 0.0 cfs @  | 0.00 hrs, Volume=  | 0 cf, Atte           | n= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

### **Summary for Link AP3:**

| Inflow A | rea = | 196,746 sf, | 5.32% Impervious, | Inflow Depth = $0.00"$ | for 0.5 Inch event   |
|----------|-------|-------------|-------------------|------------------------|----------------------|
| Inflow   | =     | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf                   |                      |
| Primary  | =     | 0.0 cfs @   | 0.00 hrs, Volume= | 0 cf, Atte             | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

## Summary for Link AP4:

| Inflow Are | a = | 14,618 sf, | 41.41% Impervious, | Inflow Depth > 0.01" | for 0.5 Inch event   |
|------------|-----|------------|--------------------|----------------------|----------------------|
| Inflow     | =   | 0.0 cfs @  | 14.38 hrs, Volume= | 14 cf                |                      |
| Primary    | =   | 0.0 cfs @  | 14.38 hrs, Volume= | 14 cf, Atte          | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 1 Inch Rainfall=1.00"              |
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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.1:  | Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>0.04"<br>Flow Length=549' Tc=7.5 min CN=76 Runoff=0.0 cfs 174 cf            |
|---------------------|--|
| SubcatchmentSC1.2:  | Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>0.02"<br>Flow Length=510' Tc=6.7 min CN=74 Runoff=0.0 cfs 221 cf            |
| SubcatchmentSC1.3:  | Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>0.70"<br>Tc=5.0 min CN=97 Runoff=0.1 cfs 331 cf                              |
| SubcatchmentSC1.4:  | Runoff Area=2,208 sf   100.00% Impervious   Runoff Depth>0.79"<br>Tc=5.0 min   CN=98   Runoff=0.0 cfs  145 cf                    |
| Subcatchment SC1.5: | Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>0.01"<br>Flow Length=337' Tc=6.4 min CN=71 Runoff=0.0 cfs 30 cf              |
| Subcatchment SC1.6: | Runoff Area=622 sf 100.00% Impervious Runoff Depth>0.79"<br>Tc=5.0 min CN=98 Runoff=0.0 cfs 41 cf                                |
| Subcatchment SC2.1: | Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>0.17"<br>Flow Length=68' Tc=5.0 min CN=85 Runoff=0.0 cfs 54 cf               |
| Subcatchment SC2.2: | Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>0.02"<br>Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=0.0 cfs 74 cf |
| SubcatchmentSC3.1:  | Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>0.02"<br>Flow Length=564' Tc=10.4 min CN=73 Runoff=0.0 cfs 94 cf             |
| Subcatchment SC3.2: | Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>0.01"<br>Flow Length=378' Tc=10.1 min CN=71 Runoff=0.0 cfs 35 cf             |
| Subcatchment SC3.3: | Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>0.01"<br>Flow Length=287' Tc=10.8 min CN=71 Runoff=0.0 cfs 40 cf             |
| SubcatchmentSC3.4:  | Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>0.20"<br>Flow Length=246' Tc=5.0 min CN=86 Runoff=0.1 cfs 203 cf            |
| SubcatchmentSC4.1:  | Runoff Area=4,504 sf   4.43% Impervious   Runoff Depth>0.02"<br>Flow Length=64'   Tc=5.0 min   CN=74   Runoff=0.0 cfs  9 cf      |
| SubcatchmentSC4.2:  | Runoff Area=10,114 sf  57.88% Impervious  Runoff Depth>0.20"<br>Flow Length=75'  Tc=12.7 min  CN=86  Runoff=0.0 cfs  165 cf      |
| Pond CB1:           | Peak Elev=298.11' Inflow=0.0 cfs 145 cf<br>12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.0 cfs 145 cf              |
| Pond CB2:           | Peak Elev=288.37' Inflow=0.1 cfs 331 cf<br>12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.1 cfs 331 cf                |

| Post-Dev Rev 2                   | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA<br>NRCC 24-hr D 1 Inch Rainfall=1.00"   |
|----------------------------------|---|
| HydroCAD® 10.10-4a s/n 01036 © 2 | RINGWAII, INC. Printed 7/14/2020<br>2020 HydroCAD Software Solutions LLC Page 23  |
| Pond DCB3:                       | Peak Elev=287.37' Storage=0 cf Inflow=0.0 cfs 221 cf<br>24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=0.0 cfs 221 cf |
| Pond DCB4:                       | Peak Elev=287.29' Storage=0 cf Inflow=0.0 cfs 174 cf<br>15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=0.0 cfs 173 cf |
| Pond DCB5:                       | Peak Elev=297.45' Inflow=0.0 cfs 94 cf<br>21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=0.0 cfs 94 cf                |
| Pond DCB6:                       | Peak Elev=297.12' Inflow=0.1 cfs 203 cf<br>21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.1 cfs 203 cf               |
| Pond DCB7:                       | Peak Elev=297.03' Inflow=0.0 cfs 35 cf<br>18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.0 cfs 35 cf                 |
| Pond DMH1:                       | Peak Elev=287.17' Inflow=0.1 cfs 697 cf<br>24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=0.1 cfs 697 cf              |
| Pond DMH2:                       | Peak Elev=296.95' Inflow=0.1 cfs 297 cf<br>30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=0.1 cfs 297 cf               |
| Pond IC-1:                       | Peak Elev=282.41' Storage=8 cf Inflow=0.1 cfs 871 cf<br>Discarded=0.1 cfs 870 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 870 cf    |
| Pond IC-2:                       | Peak Elev=295.80' Storage=0 cf Inflow=0.1 cfs 332 cf<br>Discarded=0.1 cfs 332 cf Primary=0.0 cfs 0 cf Outflow=0.1 cfs 332 cf    |
| Pond SD-1:                       | Peak Elev=300.07' Storage=3 cf Inflow=0.0 cfs 54 cf<br>Discarded=0.0 cfs 54 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 54 cf       |
| Pond SD-2:                       | Peak Elev=302.50' Storage=0 cf Inflow=0.0 cfs 9 cf<br>Discarded=0.0 cfs 9 cf Primary=0.0 cfs 0 cf Outflow=0.0 cfs 9 cf          |
| Link AP1:                        | Inflow=0.0 cfs  71 cf<br>Primary=0.0 cfs  71 cf   |
| Link AP2:                        | Inflow=0.0 cfs  74 cf<br>Primary=0.0 cfs  74 cf   |
| Link AP3:                        | Inflow=0.0 cfs  40 cf<br>Primary=0.0 cfs  40 cf   |
| Link AP4:                        | Inflow=0.0 cfs 165 cf<br>Primary=0.0 cfs 165 cf   |

# Total Runoff Area = 478,286 sf Runoff Volume = 1,615 cf Average Runoff Depth = 0.04" 88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

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# Summary for Subcatchment SC1.1:

| Runoff      | = | 0.0 cfs @ | 13.27 hrs. | Volume= | 174 cf. Depth> | 0.04" |
|-------------|---|-----------|------------|---------|----------------|-------|
| 1 Controlli |   |           |            |         |                | 0.0.  |

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A     | rea (sf) | CN [    | Description                      |              |                                    |  |  |  |
|-------|----------|---------|----------------------------------|--------------|------------------------------------|--|--|--|
|       | 24,785   | 74 >    | 74 >75% Grass cover, Good, HSG C |              |                                    |  |  |  |
|       | 21,721   | 70 \    | 70 Woods, Good, HSG C            |              |                                    |  |  |  |
|       | 14       | 89 (    | 9 Gravel roads, HSG C            |              |                                    |  |  |  |
|       | 6,226    | 98 F    | Paved park                       | ing, HSG C   |                                    |  |  |  |
|       | 1,776    | 98 F    | 98 Roofs, HSG Č                  |              |                                    |  |  |  |
|       | 54,522   | 76 \    | Neighted A                       | verage       |                                    |  |  |  |
|       | 46,520   | 8       | 35.32% Per                       | vious Area   |                                    |  |  |  |
|       | 8,002    |         | 14.68% Imp                       | pervious Are | ea                                 |  |  |  |
|       |          |         |                                  |              |                                    |  |  |  |
| Tc    | Length   | Slope   | Velocity                         | Capacity     | Description                        |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                    |  |  |  |
| 0.9   | 50       | 0.0100  | 0.90                             |              | Sheet Flow,                        |  |  |  |
|       |          |         |                                  |              | Smooth surfaces n= 0.011 P2= 3.16" |  |  |  |
| 0.2   | 35       | 0.0200  | 2.87                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Paved Kv= 20.3 fps                 |  |  |  |
| 0.6   | 50       | 0.0345  | 1.30                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |
| 1.5   | 180      | 0.1550  | 1.97                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps               |  |  |  |
| 4.3   | 234      | 0.0170  | 0.91                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |
| 7.5   | 549      | Total   |                                  |              |                                    |  |  |  |

## **Summary for Subcatchment SC1.2:**

| Runoff | = | 0.0 cfs @ | 16.55 hrs, | Volume= | 221 cf, Depth> | 0.02" |
|--------|---|-----------|------------|---------|----------------|-------|
|        |   |           | ,          |         | , I            |       |

| Area (sf) | CN | Description                   |  |  |  |
|-----------|----|-------------------------------|--|--|--|
| 46,703    | 74 | >75% Grass cover, Good, HSG C |  |  |  |
| 57,729    | 70 | Woods, Good, HSG C            |  |  |  |
| 967       | 89 | Gravel roads, HSG C           |  |  |  |
| 313       | 98 | Unconnected pavement, HSG C   |  |  |  |
| 7,362     | 98 | Paved parking, HSG C          |  |  |  |
| 2,449     | 98 | Roofs, HSG C                  |  |  |  |
| 115,523   | 74 | Weighted Average              |  |  |  |
| 105,398   |    | 91.24% Pervious Area          |  |  |  |
| 10,124    |    | 8.76% Impervious Area         |  |  |  |
| 313       |    | 3.09% Unconnected             |  |  |  |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                     |
|-------------|------------------|------------------|----------------------|-------------------|---------------------------------|
| 3.6         | 50               | 0.0600           | 0.23                 |                   | Sheet Flow,                     |
|             |                  |                  |                      |                   | Grass: Short n= 0.150 P2= 3.16" |
| 1.3         | 167              | 0.0988           | 2.20                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 0.8         | 117              | 0.1200           | 2.42                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 1.0         | 176              | 0.0400           | 3.00                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Grassed Waterway Kv= 15.0 fps   |
| 6.7         | 510              | Total            |                      |                   |                                 |

# Summary for Subcatchment SC1.3:

| Runoff | = | 0.1 cfs @ | 12.12 hrs, | Volume= | 331 cf, Depth> (          | ).70" |
|--------|---|-----------|------------|---------|---------------------------|-------|
|        |   |           | ,          |         | <b>ee</b> , <b>e</b> ep a |       |

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A           | rea (sf)         | CN            | Description               |                      |               |  |  |  |
|-------------|------------------|---------------|---------------------------|----------------------|---------------|--|--|--|
|             | 162              | 74            | >75% Gras                 | s cover, Go          | ood, HSG C    |  |  |  |
|             | 243              | 89            | Gravel road               | s, HSG C             |               |  |  |  |
|             | 5,233            | 98            | Paved park                | Paved parking, HSG C |               |  |  |  |
|             | 5,639            | 97            | Weighted A                | Weighted Average     |               |  |  |  |
|             | 405              |               | 7.19% Perv                | ious Area            |               |  |  |  |
|             | 5,233            |               | 92.81% Impervious Area    |                      |               |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slop<br>(ft/f | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs)    | Description   |  |  |  |
| 5.0         |                  |               |                           |                      | Direct Entry, |  |  |  |
|             |                  |               |                           |                      |               |  |  |  |

# Summary for Subcatchment SC1.4:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 145 cf, Depth> 0.79"

| A           | rea (sf)         | CN I             | N Description           |                   |               |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|---------------|--|--|--|
|             | 2,208            | 98 I             | 8 Paved parking, HSG C  |                   |               |  |  |  |
|             | 2,208            |                  | 100.00% Impervious Area |                   |               |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description   |  |  |  |
| 5.0         |                  |                  |                         |                   | Direct Entry, |  |  |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
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## Summary for Subcatchment SC1.5:

Runoff = 0.0 cfs @ 24.00 hrs, Volume= 30 cf, Depth> 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| Ar    | rea (sf) | CN      | Description        |             |                                 |  |  |  |  |
|-------|----------|---------|--------------------|-------------|---------------------------------|--|--|--|--|
| ;     | 37,139   | 70      | Woods, Good, HSG C |             |                                 |  |  |  |  |
|       | 441      | 98      | Unconnecte         | ed pavemer  | nt, HSG C                       |  |  |  |  |
|       | 8,658    | 74 :    | >75% Gras          | s cover, Go | bod, HSG C                      |  |  |  |  |
|       | 46,238   | 71      | Weighted A         | verage      |                                 |  |  |  |  |
| 4     | 45,797   | 9       | 99.05% Pei         | vious Area  |                                 |  |  |  |  |
|       | 441      |         | 0.95% Impe         | ervious Are | a                               |  |  |  |  |
|       | 441      |         | 100.00% Ü          | nconnected  | 1                               |  |  |  |  |
|       |          |         |                    |             |                                 |  |  |  |  |
| Tc    | Length   | Slope   | Velocity           | Capacity    | Description                     |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)           | (cfs)       |                                 |  |  |  |  |
| 3.3   | 50       | 0.0800  | 0.26               |             | Sheet Flow,                     |  |  |  |  |
|       |          |         |                    |             | Grass: Short n= 0.150 P2= 3.16" |  |  |  |  |
| 3.1   | 287      | 0.0941  | 1.53               |             | Shallow Concentrated Flow,      |  |  |  |  |
|       |          |         |                    |             | Woodland Kv= 5.0 fps            |  |  |  |  |
| 0.4   | 007      | T       |                    |             |                                 |  |  |  |  |

6.4 337 Total

#### Summary for Subcatchment SC1.6:

Runoff = 0.0 cfs @ 12.12 hrs, Volume= 41 cf, Depth> 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A           | rea (sf)         | CN [             | Description             |                   |               |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|---------------|--|--|--|
|             | 622              | 98 F             | 8 Paved parking, HSG C  |                   |               |  |  |  |
|             | 622              |                  | 100.00% Impervious Area |                   |               |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description   |  |  |  |
| 5.0         |                  |                  |                         |                   | Direct Entry, |  |  |  |

## Summary for Subcatchment SC2.1:

Runoff = 0.0 cfs @ 12.13 hrs, Volume= 54 cf, Depth> 0.17"

| A        | rea (sf) | CN D      | escription                       |              |   |  |  |  |
|----------|----------|-----------|----------------------------------|--------------|---|--|--|--|
|          | 1,953    | 74 >      | 74 >75% Grass cover, Good, HSG C |              |   |  |  |  |
|          | 1,776    | 98 F      | 98 Roofs, HSG C                  |              |   |  |  |  |
|          | 3,729    | 85 V      | Veighted A                       | verage       |   |  |  |  |
|          | 1,953    | 5         | 2.37% Per                        | vious Area   |   |  |  |  |
|          | 1,776    | 4         | 7.63% Imp                        | ervious Are  | ea  |  |  |  |
|          |          |           |                                  |              |   |  |  |  |
| Tc       | Length   | Slope     | Velocity                         | Capacity     | Description                                     |  |  |  |
| (min)    | (feet)   | (ft/ft)   | (ft/sec)                         | (cfs)        |   |  |  |  |
| 4.3      | 50       | 0.0400    | 0.19                             |              | Sheet Flow,                                     |  |  |  |
|          |          |           |                                  |              | Grass: Short n= 0.150 P2= 3.16"                 |  |  |  |
| 0.2      | 18       | 0.0300    | 1.21                             |              | Shallow Concentrated Flow,                      |  |  |  |
|          |          |           |                                  |              | Short Grass Pasture Kv= 7.0 fps                 |  |  |  |
| 4.5      | 68       | Total, I  | ncreased t                       | o minimum    | Tc = 5.0 min                                    |  |  |  |
|          |          |           |                                  |              |   |  |  |  |
|          |          |           | Sum                              | mary for     | Subcatchment SC2.2:                             |  |  |  |
|          |          |           |                                  | ,            |   |  |  |  |
| Runoff   | =        | 0.0 c     | fs@ 16.5                         | 64 hrs. Volu | ume= 74 cf. Depth> 0.02"                        |  |  |  |
|          |          |           | 0                                | ,            | ,         |  |  |  |
| Runoff b | y SCS TF | R-20 meth | nod, UH=S                        | CS, Weigh    | ted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs |  |  |  |
| NRCC 2   | 4-hr D 1 | Inch Rair | nfall=1.00"                      | · C          | · · ·   |  |  |  |
|          |          |           |                                  |              |   |  |  |  |
| A        | rea (sf) | CN A      | Adj Desc                         | ription      |   |  |  |  |
|          | 7,180    | 74        | >75%                             | 6 Grass co   | ver, Good, HSG C                                |  |  |  |
|          | 22,269   | 70        | Woo                              | ds, Good, H  | HSG C   |  |  |  |
|          | 8,992    | 98        | Unco                             | onnected pa  | avement, HSG C                                  |  |  |  |
|          | 38,441   | 77        | 74 Weig                          | hted Avera   | age, UI Adjusted                                |  |  |  |
|          | 29,449   |           | 76.6                             | 1% Perviou   | is Area   |  |  |  |
|          | 8,992    |           | 23.39                            | 9% Impervi   | ous Area  |  |  |  |
|          | 8,992    |           | 100.0                            | 00% Uncon    | nected  |  |  |  |
|          |          |           |                                  |              |   |  |  |  |
| Тс       | Length   | Slope     | Velocity                         | Capacity     | Description                                     |  |  |  |
| (min)    | (feet)   | (ft/ft)   | (ft/sec)                         | (cfs)        |   |  |  |  |
| 5.7      | 50       | 0.0200    | 0.15                             |              | Sheet Flow,                                     |  |  |  |
|          |          |           |                                  |              | Grass: Short n= 0.150 P2= 3.16"                 |  |  |  |
| 0.2      | 29       | 0.1700    | 2.89                             |              | Shallow Concentrated Flow,                      |  |  |  |
|          |          |           |                                  |              | Short Grass Pasture Kv= 7.0 fps                 |  |  |  |
| 0.5      | 61       | 0.1800    | 2.12                             |              | Shallow Concentrated Flow,                      |  |  |  |
|          |          |           |                                  |              | Woodland Kv= 5.0 fps                            |  |  |  |

140 Total 6.4

## Summary for Subcatchment SC3.1:

Runoff 0.0 cfs @ 22.27 hrs, Volume= =

94 cf, Depth> 0.02"

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| ۸.    |          |                  | <b>D</b> = = = = = = = = = = = = = = = = = = = |              |                                 |  |  |  |
|-------|----------|------------------|--|--------------|---------------------------------|--|--|--|
| A     | rea (sr) | CN               | CN Description                                 |              |                                 |  |  |  |
|       | 32,168   | 74 :             | >75% Gras                                      | s cover, Go  | od, HSG C                       |  |  |  |
|       | 31,971   | 70               | Woods, Go                                      | od, HSG C    |                                 |  |  |  |
|       | 364      | 89               | Gravel road                                    | ls, HSG C    |                                 |  |  |  |
|       | 55       | 98               | Paved park                                     | ing, HSG C   |                                 |  |  |  |
|       | 2,321    | 98               | Roofs, HSC                                     | S Č          |                                 |  |  |  |
|       | 66,880   | 73               | Weighted A                                     | verage       |                                 |  |  |  |
|       | 64.504   | (                | 96.45% Pei                                     | vious Area   |                                 |  |  |  |
|       | 2.376    | 4                | 3.55% Impe                                     | ervious Area | 3                               |  |  |  |
|       | _,       |                  |  |              |                                 |  |  |  |
| Тс    | Length   | Slope            | Velocity                                       | Capacity     | Description                     |  |  |  |
| (min) | (feet)   | (ft/ft)          | (ft/sec)                                       | (cfs)        |                                 |  |  |  |
| 5.7   | 50       | 0.0200           | 0.15   |              | Sheet Flow,                     |  |  |  |
|       |          |                  |  |              | Grass: Short n= 0.150 P2= 3.16" |  |  |  |
| 2.1   | 247      | 0.0800           | 1.98   |              | Shallow Concentrated Flow.      |  |  |  |
|       |          |                  |  |              | Short Grass Pasture Kv= 7.0 fps |  |  |  |
| 1.5   | 133      | 0.0830           | 1.44   |              | Shallow Concentrated Flow.      |  |  |  |
|       |          |                  |  |              | Woodland Ky= 5.0 fps            |  |  |  |
| 1.1   | 134      | 0.0820           | 2.00   |              | Shallow Concentrated Flow.      |  |  |  |
|       |          |                  |  |              | Short Grass Pasture Kv= 7.0 fps |  |  |  |
| 40.4  | 504      | <b>T</b> . 4 . 1 |  |              |                                 |  |  |  |

10.4 564 Total

# Summary for Subcatchment SC3.2:

Runoff = 0.0 cfs @ 24.00 hrs, Volume=

35 cf, Depth> 0.01"

| A     | rea (sf) | CN      | N Description                    |              |  |  |  |  |  |
|-------|----------|---------|----------------------------------|--------------|--|--|--|--|--|
|       | 12,832   | 74      | 74 >75% Grass cover, Good, HSG C |              |  |  |  |  |  |
|       | 880      | 98      | Roofs, HSG                       | Roofs, HSG C |  |  |  |  |  |
|       | 41,349   | 70      | Woods, Go                        | od, HSG C    |  |  |  |  |  |
|       | 55,060   | 71      | Weighted A                       | verage       |  |  |  |  |  |
|       | 54,180   |         | 98.40% Pei                       | vious Area   |  |  |  |  |  |
|       | 880      |         | 1.60% Impe                       | ervious Area | а  |  |  |  |  |
|       |          |         | -                                |              |  |  |  |  |  |
| Tc    | Length   | Slope   | e Velocity                       | Capacity     | Description                                |  |  |  |  |
| (min) | (feet)   | (ft/ft) | ) (ft/sec)                       | (cfs)        |  |  |  |  |  |
| 7.1   | 50       | 0.0800  | 0.12                             |              | Sheet Flow,                                |  |  |  |  |
|       |          |         |                                  |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |  |
| 1.7   | 204      | 0.1600  | 2.00                             |              | Shallow Concentrated Flow,                 |  |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps                       |  |  |  |  |
| 1.3   | 124      | 0.0530  | ) 1.61                           |              | Shallow Concentrated Flow,                 |  |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps            |  |  |  |  |
| 10.1  | 378      | Total   |                                  |              |  |  |  |  |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 1 Inch Rainfall=1.00"              |
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# Summary for Subcatchment SC3.3:

| Runoff = $0.0 \text{ cfs} @ 24.00 \text{ hrs}$ , Volume= 40 | cf, Depth> | 0.01" |
|---|------------|-------|
|---|------------|-------|

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A           | rea (sf)         | CN [             | Description                   |                   |   |  |  |  |  |
|-------------|------------------|------------------|-------------------------------|-------------------|---|--|--|--|--|
|             | 12,393           | 74 >             | >75% Grass cover, Good, HSG C |                   |   |  |  |  |  |
|             | 49,047           | 70 \             | Voods, Go                     | od, HSG C         |   |  |  |  |  |
|             | 1,019            | 98 l             | Jnconnecte                    | ed pavemer        | nt, HSG C   |  |  |  |  |
|             | 62,459           | 71 \             | Veighted A                    | verage            |   |  |  |  |  |
|             | 61,440           | ę                | 98.37% Pei                    | vious Area        |   |  |  |  |  |
|             | 1,019            |                  | l.63% Impe                    | ervious Area      | а   |  |  |  |  |
|             | 1,019            | -                | 100.00% Ui                    | nconnected        | 1   |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)          | Capacity<br>(cfs) | Description   |  |  |  |  |
| 8.6         | 50               | 0.0500           | 0.10                          |                   | Sheet Flow,   |  |  |  |  |
| 2.2         | 237              | 0.1350           | 1.84                          |                   | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |  |  |  |  |
| 10.8        | 287              | Total            |                               |                   |   |  |  |  |  |

# Summary for Subcatchment SC3.4:

Runoff = 0.1 cfs @ 12.13 hrs, Volume=

203 cf, Depth> 0.20"

| Α     | rea (sf) | CN [    | Description                      |              |                                    |  |  |  |
|-------|----------|---------|----------------------------------|--------------|------------------------------------|--|--|--|
|       | 5,554    | 74 >    | 74 >75% Grass cover, Good, HSG C |              |                                    |  |  |  |
|       | 529      | 70 \    | Voods, Good, HSG C               |              |                                    |  |  |  |
|       | 76       | 89 (    | Gravel road                      | ls, HSG C    |                                    |  |  |  |
|       | 6,187    | 98 F    | Paved park                       | ing, HSG C   |                                    |  |  |  |
|       | 12,347   | 86 \    | 86 Weighted Average              |              |                                    |  |  |  |
|       | 6,159    | 4       | 19.89% Pei                       | vious Area   |                                    |  |  |  |
|       | 6,187    | Ę       | 50.11% Imp                       | pervious Are | ea                                 |  |  |  |
| _     |          |         |                                  |              |                                    |  |  |  |
| Tc    | Length   | Slope   | Velocity                         | Capacity     | Description                        |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                    |  |  |  |
| 1.3   | 113      | 0.0200  | 1.40                             |              | Sheet Flow,                        |  |  |  |
|       |          |         |                                  |              | Smooth surfaces n= 0.011 P2= 3.16" |  |  |  |
| 2.4   | 38       | 0.1000  | 0.27                             |              | Sheet Flow,                        |  |  |  |
|       |          |         |                                  |              | Grass: Short n= 0.150 P2= 3.16"    |  |  |  |
| 0.9   | 95       | 0.0600  | 1.71                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |
| 4.6   | 246      | Total,  | Increased t                      | o minimum    | Tc = 5.0 min                       |  |  |  |

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## Summary for Subcatchment SC4.1:

Runoff = 0.0 cfs @ 16.53 hrs, Volume= 9 cf, Depth> 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 1 Inch Rainfall=1.00"

| A     | rea (sf) | CN     | Description        |             |                                 |  |  |  |  |
|-------|----------|--------|--------------------|-------------|---------------------------------|--|--|--|--|
|       | 1,020    | 70     | Woods, Good, HSG C |             |                                 |  |  |  |  |
|       | 200      | 98     | Unconnecte         | ed pavemer  | nt, HSG C                       |  |  |  |  |
|       | 3,285    | 74     | >75% Gras          | s cover, Go | bod, HSG C                      |  |  |  |  |
|       | 4,504    | 74     | Weighted A         | verage      |                                 |  |  |  |  |
|       | 4,305    |        | 95.57% Pei         | vious Area  |                                 |  |  |  |  |
|       | 200      |        | 4.43% Impe         | ervious Are | а                               |  |  |  |  |
|       | 200      |        | 100.00% U          | nconnected  | 1                               |  |  |  |  |
|       |          |        |                    |             |                                 |  |  |  |  |
| Тс    | Length   | Slope  | e Velocity         | Capacity    | Description                     |  |  |  |  |
| (min) | (feet)   | (ft/ft | ) (ft/sec)         | (cfs)       |                                 |  |  |  |  |
| 3.6   | 50       | 0.0600 | 0.23               |             | Sheet Flow,                     |  |  |  |  |
|       |          |        |                    |             | Grass: Short n= 0.150 P2= 3.16" |  |  |  |  |
| 0.2   | 14       | 0.0400 | ) 1.40             |             | Shallow Concentrated Flow,      |  |  |  |  |
|       |          |        |                    |             | Short Grass Pasture Kv= 7.0 fps |  |  |  |  |
| 3.8   | 64       | Total, | Increased t        | o minimum   | 1 Tc = 5.0 min                  |  |  |  |  |

# **Summary for Subcatchment SC4.2:**

Runoff = 0.0 cfs @ 12.22 hrs, Volume= 165 cf, Depth> 0.20"

| A     | rea (sf) | CN [    | Description         |              |  |
|-------|----------|---------|---------------------|--------------|--|
|       | 3,927    | 70 \    | Voods, Go           | od, HSG C    |  |
|       | 5,854    | 98 l    | Jnconnecte          | ed pavemer   | nt, HSG C                                  |
|       | 333      | 74 >    | <u>&gt;75% Gras</u> | s cover, Go  | ood, HSG C                                 |
|       | 10,114   | 86 \    | Veighted A          | verage       |  |
|       | 4,260    | 2       | 2.12% Pe            | vious Area   |  |
|       | 5,854    | Ę       | 57.88% Imp          | pervious Are | ea   |
|       | 5,854    |         | 100.00% Ui          | nconnected   | 1  |
| _     |          |         |                     | _            |  |
| Tc    | Length   | Slope   | Velocity            | Capacity     | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec)            | (cfs)        |  |
| 12.4  | 50       | 0.0200  | 0.07                |              | Sheet Flow,                                |
|       |          |         |                     |              | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 0.3   | 25       | 0.0800  | 1.41                |              | Shallow Concentrated Flow,                 |
|       |          |         |                     |              | Woodland Kv= 5.0 fps                       |
| 12.7  | 75       | Total   |                     |              |  |
|       |          |         |                     |              |  |

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## Summary for Pond CB1:

| Inflow Area | a = | 2,208 sf,100. | .00% Impervious, | Inflow Depth > | 0.79" 1   | for 1 Inch event   |
|-------------|-----|---------------|------------------|----------------|-----------|--------------------|
| Inflow      | =   | 0.0 cfs @ 12. | 12 hrs, Volume=  | 145 c          | of        |                    |
| Outflow     | =   | 0.0 cfs @ 12. | 12 hrs, Volume=  | 145 c          | of, Atten | = 0%, Lag= 0.0 min |
| Primary     | =   | 0.0 cfs @ 12. | 12 hrs, Volume=  | 145 c          | of        | -                  |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.11' @ 12.12 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 298.00' | <b>12.0" Round Culvert</b><br>L= 220.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=298.11' TW=287.17' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 0.0 cfs @ 0.90 fps)

## Summary for Pond CB2:

| Inflow Area | a = | 5,639 sf, | 92.81% Impervious, | Inflow Depth > 0.7 | 70" for 1 Inch event    |
|-------------|-----|-----------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 0.1 cfs @ | 12.12 hrs, Volume= | 331 cf             |                         |
| Outflow     | =   | 0.1 cfs @ | 12.12 hrs, Volume= | 331 cf,            | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 0.1 cfs @ | 12.12 hrs, Volume= | 331 cf             | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.37' @ 12.12 hrs Flood Elev= 292.30'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 288.20' | <b>12.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=288.37' TW=287.17' (Dynamic Tailwater) ←1=Culvert (Inlet Controls 0.1 cfs @ 1.12 fps)

## Summary for Pond DCB3:

| Inflow Area | a = | 115,523 sf, | 8.76% Impervious,  | Inflow Depth > 0.02" | for 1 Inch event     |
|-------------|-----|-------------|--------------------|----------------------|----------------------|
| Inflow      | =   | 0.0 cfs @   | 16.55 hrs, Volume= | 221 cf               |                      |
| Outflow     | =   | 0.0 cfs @   | 16.55 hrs, Volume= | 221 cf, Atte         | en= 0%, Lag= 0.1 min |
| Primary     | =   | 0.0 cfs @   | 16.55 hrs, Volume= | 221 cf               |                      |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

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Peak Elev= 287.37' @ 16.55 hrs Surf.Area= 1 sf Storage= 0 cf Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 1.1 min calculated for 221 cf (100% of inflow) Center-of-Mass det. time= 0.6 min (1,123.6 - 1,123.0)

| Volume           | Inv     | ert Avai             | I.Storage                                 | Storage Description  | on  |   |               |
|------------------|---------|----------------------|---|--|---|---|---------------|
| #1               | 287.0   | )0'                  | 310 cf                                    | Custom Stage D   | <b>ata (Irregular)</b> List                                 | ed below (Recalc)   |               |
| Elevatio<br>(fee | n<br>t) | Surf.Area<br>(sq-ft) | Perim.<br>(feet)                          | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)                                   | Wet.Area<br>(sq-ft)                                       |               |
| 287.0            | 0       | 1                    | 1.0                                       | 0  | 0   | 1   |               |
| 288.0            | 0       | 1                    | 1.0                                       | 1  | 1   | 2   |               |
| 289.0            | 0       | 1                    | 1.0                                       | 1  | 2   | 3   |               |
| 290.0            | 0       | 1                    | 1.0                                       | 1  | 3   | 4   |               |
| 291.0            | 0       | 89                   | 87.5                                      | 33   | 36  | 615   |               |
| 292.0            | 0       | 519                  | 180.8                                     | 274  | 310   | 2,611   |               |
| Device           | Routing | In                   | vert Outle                                | et Devices   |   |   |               |
| #1               | Primary | 287                  | .34' <b>24.0</b><br>L= 1<br>Inlet<br>n= 0 | <b>" Round Culvert</b><br>2.0' CPP, projecti<br>/ Outlet Invert= 28<br>.013 Corrugated F | ng, no headwall,<br>7.34' / 287.10' S<br>PE, smooth interio | Ke= 0.900<br>= 0.0200 '/'    Cc= 0<br>r,  Flow Area= 3.14 | 0.900<br>4 sf |

Primary OutFlow Max=0.0 cfs @ 16.55 hrs HW=287.37' TW=287.05' (Dynamic Tailwater) -1=Culvert (Inlet Controls 0.0 cfs @ 0.50 fps)

#### Summary for Pond DCB4:

| Inflow Area | a = | 54,522 sf, | 14.68% Impervious, | Inflow Depth > 0.04" | for 1 Inch event     |
|-------------|-----|------------|--------------------|----------------------|----------------------|
| Inflow      | =   | 0.0 cfs @  | 13.27 hrs, Volume= | 174 cf               |                      |
| Outflow     | =   | 0.0 cfs @  | 13.27 hrs, Volume= | 173 cf, Atte         | en= 0%, Lag= 0.1 min |
| Primary     | =   | 0.0 cfs @  | 13.27 hrs, Volume= | 173 cf               | •                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.29' @ 13.27 hrs Surf.Area= 1 sf Storage= 0 cf Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 1.1 min calculated for 173 cf (100% of inflow) Center-of-Mass det. time= 0.5 min (1,073.9 - 1,073.4)

| Volume              | Invert    | Avail           | .Storage         | Storage Description       |                             |                             |
|---------------------|-----------|-----------------|------------------|---------------------------|-----------------------------|-----------------------------|
| #1                  | 287.00'   |                 | 250 cf           | Custom Stage Data         | <b>a (Irregular)</b> Listed | below (Recalc)              |
| Elevation<br>(feet) | Surf<br>( | Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft <u>)</u> |
| 287.00              |           | 1               | 1.0              | 0                         | 0                           | 1                           |
| 288.00              |           | 1               | 1.0              | 1                         | 1                           | 2                           |
| 289.00              |           | 1               | 1.0              | 1                         | 2                           | 3                           |
| 290.00              |           | 1               | 1.0              | 1                         | 3                           | 4                           |
| 291.00              |           | 714             | 132.0            | 247                       | 250                         | 1,392                       |

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.25' | <b>15.0" Round Culvert</b><br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=0.0 cfs @ 13.27 hrs HW=287.29' TW=282.40' (Dynamic Tailwater) **1=Culvert** (Barrel Controls 0.0 cfs @ 0.77 fps)

## Summary for Pond DCB5:

| Inflow Area | ı = | 66,880 sf, | 3.55% Impervious,  | Inflow Depth > 0 | ).02" for 1 In | ich event    |
|-------------|-----|------------|--------------------|------------------|----------------|--------------|
| Inflow      | =   | 0.0 cfs @  | 22.27 hrs, Volume= | 94 cf            |                |              |
| Outflow     | =   | 0.0 cfs @  | 22.27 hrs, Volume= | 94 cf            | , Atten= 0%, I | Lag= 0.0 min |
| Primary     | =   | 0.0 cfs @  | 22.27 hrs, Volume= | 94 cf            |                | -            |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 297.45' @ 22.27 hrs Flood Elev= 302.50'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.42' | 21.0" Round Culvert  |
|        |         |         | L= 47.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |         |         | Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf      |

Primary OutFlow Max=0.0 cfs @ 22.27 hrs HW=297.45' TW=296.88' (Dynamic Tailwater) -1=Culvert (Barrel Controls 0.0 cfs @ 0.62 fps)

## Summary for Pond DCB6:

| Inflow Are | ea = | 12,347 sf, | 50.11% Impervious, | Inflow Depth > 0.20" | for 1 Inch event     |
|------------|------|------------|--------------------|----------------------|----------------------|
| Inflow     | =    | 0.1 cfs @  | 12.13 hrs, Volume= | 203 cf               |                      |
| Outflow    | =    | 0.1 cfs @  | 12.13 hrs, Volume= | 203 cf, Atte         | en= 0%, Lag= 0.0 min |
| Primary    | =    | 0.1 cfs @  | 12.13 hrs, Volume= | 203 cf               | -                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 297.12' @ 12.13 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>21.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |

Primary OutFlow Max=0.1 cfs @ 12.13 hrs HW=297.12' TW=296.95' (Dynamic Tailwater) **1=Culvert** (Barrel Controls 0.1 cfs @ 1.31 fps) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D1 Inch Rainfall=1.00"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 34

## Summary for Pond DCB7:

| Inflow Area | a = | 55,060 sf, | 1.60% Impervious,  | Inflow Depth > 0.0 | 1" for 1 Inch event     |
|-------------|-----|------------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 0.0 cfs @  | 24.00 hrs, Volume= | 35 cf              |                         |
| Outflow     | =   | 0.0 cfs @  | 24.00 hrs, Volume= | 35 cf, <i>1</i>    | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 0.0 cfs @  | 24.00 hrs, Volume= | 35 cf              | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 297.03' @ 24.00 hrs Flood Elev= 302.70'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>18.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |

Primary OutFlow Max=0.0 cfs @ 24.00 hrs HW=297.03' TW=295.80' (Dynamic Tailwater) ↓ 1=Culvert (Barrel Controls 0.0 cfs @ 0.51 fps)

## Summary for Pond DMH1:

| Inflow Area | a = | 123,370 sf, | 14.24% Impervious, | Inflow Depth > 0 | 0.07" for 1 Inch event    |
|-------------|-----|-------------|--------------------|------------------|---------------------------|
| Inflow      | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 697 cf           |                           |
| Outflow     | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 697 cf           | , Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 697 cf           | -                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.17' @ 12.12 hrs Flood Elev= 292.00'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.00' | <b>24.0" Round Culvert</b><br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=287.17' TW=282.41' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 0.1 cfs @ 1.11 fps)

## Summary for Pond DMH2:

| Inflow Area | a = | 79,226 sf, | 10.81% Impervious, | Inflow Depth > 0.04" | for 1 Inch event     |
|-------------|-----|------------|--------------------|----------------------|----------------------|
| Inflow      | =   | 0.1 cfs @  | 12.13 hrs, Volume= | 297 cf               |                      |
| Outflow     | =   | 0.1 cfs @  | 12.13 hrs, Volume= | 297 cf, Atte         | en= 0%, Lag= 0.0 min |
| Primary     | =   | 0.1 cfs @  | 12.13 hrs, Volume= | 297 cf               |                      |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

\_

Peak Elev= 296.95' @ 12.13 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 296.85' | <b>30.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf |

Primary OutFlow Max=0.1 cfs @ 12.13 hrs HW=296.95' TW=295.80' (Dynamic Tailwater) ☐ 1=Culvert (Barrel Controls 0.1 cfs @ 1.23 fps)

# Summary for Pond IC-1:

| Inflow Area | a = | 177,892 sf, | 14.37% Impervious, | Inflow Depth > 0. | 06" for 1 Inch event     |
|-------------|-----|-------------|--------------------|-------------------|--------------------------|
| Inflow      | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 871 cf            |                          |
| Outflow     | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 870 cf,           | Atten= 23%, Lag= 0.0 min |
| Discarded   | =   | 0.1 cfs @   | 12.12 hrs, Volume= | 870 cf            |                          |
| Primary     | =   | 0.0 cfs @   | 0.00 hrs, Volume=  | 0 cf              |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 282.41' @ 12.16 hrs Surf.Area= 2,021 sf Storage= 8 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= (not calculated: outflow precedes inflow)

| Volume | Invert  | Avail.Storage | Storage Description   |
|--------|---------|---------------|---|
| #1     | 282.40' | 3,658 cf      | IC-1 Stone bed (Irregular)Listed below (Recalc)                 |
|        |         |               | 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids  |
| #2     | 283.40' | 5,002 cf      | ADS_StormTech MC-4500 b +Cap x 44 Inside #1                     |
|        |         |               | Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf |
|        |         |               | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap      |
|        |         |               | 44 Chambers in 4 Rows   |
|        |         |               | Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf                   |
| #3     | 283.00' | 200 cf        | PES-1 Stone bed (Pyramidal)Listed below (Recalc)                |
|        |         |               | 625 cf Overall - 126 cf Embedded = 499 cf $\times$ 40.0% Voids  |
| #4     | 283.00' | 126 cf        | 24.0" Round Pipe Storage Inside #3                              |
|        |         |               | L= 40.0'  |

| Elevation | Surf.Area | Perim. | Inc.Store    | Cum.Store    | Wet.Area |
|-----------|-----------|--------|--------------|--------------|----------|
| (feet)    | (sq-ft)   | (feet) | (cubic-feet) | (cubic-feet) | (sq-ft)  |
| 282.40    | 2,021     | 188.0  | 0            | 0            | 2,021    |
| 283.00    | 2,021     | 188.0  | 1,213        | 1,213        | 2,134    |
| 284.00    | 2,021     | 188.0  | 2,021        | 3,234        | 2,322    |
| 285.00    | 2,021     | 188.0  | 2,021        | 5,255        | 2,510    |
| 286.00    | 2,021     | 188.0  | 2,021        | 7,276        | 2,698    |
| 287.00    | 2,021     | 188.0  | 2,021        | 9,297        | 2,886    |
| 288.00    | 2,021     | 188.0  | 2,021        | 11,318       | 3,074    |
| 289.00    | 2,021     | 188.0  | 2,021        | 13,339       | 3,262    |
| 289.40    | 2,021     | 188.0  | 808          | 14,147       | 3,337    |
|           |           |        |              |              |          |

8,985 cf Total Available Storage

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|---------------------------|---------------------------|-----------------------------|
| 283.00              | 250                  | 0                         | 0                         | 250                         |
| 284.00              | 250                  | 250                       | 250                       | 313                         |
| 285.00              | 250                  | 250                       | 500                       | 376                         |
| 285.50              | 250                  | 125                       | 625                       | 408                         |

| Device | Routing   | Invert  | Outlet Devices   |
|--------|-----------|---------|--|
| #1     | Discarded | 282.40' | 2.410 in/hr Exfiltration over Surface area                       |
| #2     | Primary   | 285.50' | 50.0' long x 2.5' breadth Broad-Crested Rectangular Weir         |
|        |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|        |           |         | 2.50 3.00 3.50 4.00  |
|        |           |         | Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74     |
|        |           |         | 2.76 2.89 3.05 3.19 3.32   |
| #3     | Device 2  | 284.10' | 24.0" Round Culvert  |
|        |           |         | L= 70.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |           |         | Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 |
|        |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf      |
| #4     | Device 3  | 284.10' | 20.0" W x 12.0" H Vert. Orifice/Grate C= 0.600                   |
|        |           |         | Limited to weir flow at low heads                                |
| #5     | Device 3  | 287.00' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |

**Discarded OutFlow** Max=0.1 cfs @ 12.12 hrs HW=282.41' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=282.40' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

-3=Culvert (Controls 0.0 cfs)

4=Orifice/Grate (Controls 0.0 cfs) 5=Share Create it is a second second

-5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

# Summary for Pond IC-2:

| Inflow Area | a = | 134,287 sf, | 7.03% Impervious,  | Inflow Depth > 0 | .03" for 1 Inch event   |
|-------------|-----|-------------|--------------------|------------------|-------------------------|
| Inflow      | =   | 0.1 cfs @   | 12.13 hrs, Volume= | 332 cf           |                         |
| Outflow     | =   | 0.1 cfs @   | 12.13 hrs, Volume= | 332 cf,          | Atten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.1 cfs @   | 12.13 hrs, Volume= | 332 cf           |                         |
| Primary     | =   | 0.0 cfs @   | 0.00 hrs, Volume=  | 0 cf             |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 295.80' @ 12.13 hrs Surf.Area= 1,247 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 0.0 min (1,024.6 - 1,024.6)

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| Volume           | Invert       | Avail.St            | orage  | Storage Desc   | ription   |  |                                     |   |
|------------------|--------------|---------------------|--|--|---|--|-------------------------------------|---|
| #1               | 295.80'      | 2,2                 | 234 cf                                       | IC-2 Stone bed (Irregular)Listed below (Recalc)  |   |  |                                     |   |
| #2               | 296.80'      | 3,                  | 143 cf                                       | 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids<br><b>ADS_StormTech MC-4500 b +Cap @ 4.03' L</b> x 28 Inside #1<br>Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.6 cf<br>Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap |   |  |                                     |   |
| #3               | 296.00'      |                     | 172 cf                                       | Cap Storage=<br>PES-2 Stone<br>500 cf Overal   | = +39.5<br><b>bed (</b>                           | 5 cf x 2 x 2 rov<br>Pyramidal)Lis                  | vs = 158.<br>ited belov<br>= 429 cf | 0 cf<br>v (Recalc)<br>x 40 0% Voids                           |
| #4               | 296.00'      |                     | 71 cf  | <b>18.0" Round</b><br>L= 40.0'   | l Pipe  | Storage Insid                                      | e #3                                |   |
|                  |              | 5,0                 | 620 cf                                       | Total Availabl   | e Stor  | age  |                                     |   |
| Elevatio<br>(fee | on Si<br>et) | urf.Area<br>(sq-ft) | Perim.<br>(feet)                             | Inc.Sto<br>(cubic-fe   | ore<br>et)  | Cum.Store<br>(cubic-feet                           | e<br>)                              | Wet.Area<br>(sq-ft)   |
| 295.8            | 30           | 1.247               | 165.0  |  | 0   |  | )                                   | 1.247   |
| 296.0            | 00           | 1,247               | 165.0  | 2  | 49  | 249  | )                                   | 1,280   |
| 297.0            | 00           | 1,247               | 165.0  | 1,2  | 47  | 1,496  | 6                                   | 1,445   |
| 298.0            | 00           | 1,247               | 165.0  | 1,2  | 47  | 2,743  | 3                                   | 1,610   |
| 299.0            | 00           | 1,247               | 165.0  | 1,2  | 47  | 3,990  | )                                   | 1,775   |
| 300.0            | 00           | 1,247               | 165.0  | 1,2  | 47  | 5,237  | 7                                   | 1,940   |
| 301.0            | 00           | 1,247               | 165.0  | 1,2  | 47  | 6,484  | 1                                   | 2,105   |
| 302.0            | 00           | 1,247               | 165.0  | 1,2  | 47  | 7,731  |                                     | 2,270   |
| 302.8            | 80           | 1,247               | 165.0  | 9  | 98  | 8,729  | )                                   | 2,402   |
| Elevatio         | on Si        | urf.Area            | Inc  | Store C  | Sum.St  | ore W  | /et.Area                            |   |
| (fee             | et)          | (sa-ft)             | (cubi  | c-feet) (c   | ubic-fe   | et)  | (sa-ft)                             |   |
| 296 (            | <u> </u>     | 250                 | 1  | 0  |   | 0  | 250                                 |   |
| 297 (            | 0            | 250                 |  | 250  | 2   | 250  | 313                                 |   |
| 298.0            | 00           | 250                 |  | 250  | Ę   | 500  | 376                                 |   |
| Device           | Routing      | Invert              | Outle  | et Devices   |   |  |                                     |   |
| #1               | Discarded    | 295.80              | 2.41   | 0 in/hr Exfiltra   | ation o   | ver Surface a                                      | area                                |   |
| #2               | Primary      | 298.00              | 50.0<br>Hea<br>2.50<br>Coe                   | <b>' long x 2.0' b</b><br>d (feet) 0.20 (<br>3.00 3.50<br>f. (English) 2.5   | <b>readth</b><br>0.40 0<br>54 2.6                 | <b>Broad-Cres</b><br>.60 0.80 1.00<br>1 2.61 2.60  | ted Rect<br>1.20 1<br>2.66 2.7      | <b>angular Weir</b><br>.40 1.60 1.80 2.00<br>0 2.77 2.89 2.88 |
| #3               | Device 2     | 296.50              | 2.85<br><b>18.0</b><br>L= 2<br>Inlet<br>n= 0 | 3.07 3.20 3.<br><b>Round Culv</b><br>0.0' CPP, pro<br>/ Outlet Invert=<br>.013 Corrugat  | 32<br>/ <b>ert</b><br>jecting<br>= 296.{<br>ed PE | ı, no headwall<br>50' / 296.00'<br>. smooth interi | , Ke= 0.9<br>S= 0.025<br>ior. Flow  | 900<br>0 '/' Cc= 0.900<br>Area= 1.77 sf                       |
| #4               | Device 3     | 296.50              | 23.0<br>Limi                                 | "W x 6.0"H V<br>ted to weir flow   | /ert. O   | rifice/Grate                                       | C= 0.600                            |   |
| #5               | Device 3     | 299.90              | 4.0'   | long Sharp-Ci  | rested  | Vee/Trap We  | eir Cv= 2                           | .62 (C= 3.28)   |

# Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D1 Inch Rainfall=1.00"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 38

**Discarded OutFlow** Max=0.1 cfs @ 12.13 hrs HW=295.80' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=295.80' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.0 cfs) 3=Culvert (Controls 0.0 cfs) 4=Orifice/Grate (Controls 0.0 cfs) 5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

# Summary for Pond SD-1:

| Inflow Area | n = | 3,729 sf, | 47.63% Impervious, | Inflow Depth > 0.17 | " for 1 Inch event      |
|-------------|-----|-----------|--------------------|---------------------|-------------------------|
| Inflow      | =   | 0.0 cfs @ | 12.13 hrs, Volume= | 54 cf               |                         |
| Outflow     | =   | 0.0 cfs @ | 12.10 hrs, Volume= | 54 cf, A            | tten= 57%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 12.10 hrs, Volume= | 54 cf               | -                       |
| Primary     | =   | 0.0 cfs @ | 0.00 hrs, Volume=  | 0 cf                |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.07' @ 12.26 hrs Surf.Area= 109 sf Storage= 3 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 1.1 min ( 940.5 - 939.5 )

| Volume           | Invert               | Avail.St           | orage  | Storage Descriptio  | n   |  |
|------------------|----------------------|--------------------|--|---|---|--|
| #1               | 300.00'              |                    | 44 cf  | <b>Custom Stage Da</b><br>109 cf Overall x 40   | t <b>a (Irregular)</b> Liste<br>0.0% Voids  | ed below (Recalc)  |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)  |
| 300.0<br>301.0   | )0<br>)0             | 109<br>109         | 113.3<br>113.3   | 0<br>109  | 0<br>109  | 109<br>222   |
| Device           | Routing              | Invert             | Outle  | et Devices  |   |  |
| #1<br>#2         | Discarded<br>Primary | 300.00'<br>300.90' | <b>2.41</b><br><b>55.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40 (<br>3.00 3.50 4.00 4.<br>f. (English) 2.38 2.8<br>2.72 2.73 2.76 2 | over Surface are    th Broad-Crester    0.60  0.80  1.00    .50  5.00  5.50    54  2.69  2.68  2.6    .79  2.88  3.07  3. | ea<br>d Rectangular Weir<br>1.20 1.40 1.60 1.80 2.00<br>67 2.67 2.65 2.66 2.66<br>32 |

**Discarded OutFlow** Max=0.0 cfs @ 12.10 hrs HW=300.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=300.00' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Controls 0.0 cfs) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D1 Inch Rainfall=1.00"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 39

## Summary for Pond SD-2:

| Inflow Area | ı = | 4,504 sf, | 4.43% Impervious,  | Inflow Depth > 0.02" for 1 Inch event |
|-------------|-----|-----------|--------------------|---------------------------------------|
| Inflow      | =   | 0.0 cfs @ | 16.53 hrs, Volume= | 9 cf                                  |
| Outflow     | =   | 0.0 cfs @ | 16.53 hrs, Volume= | 9 cf, Atten= 0%, Lag= 0.0 min         |
| Discarded   | =   | 0.0 cfs @ | 16.53 hrs, Volume= | 9 cf                                  |
| Primary     | =   | 0.0 cfs @ | 0.00 hrs, Volume=  | 0 cf                                  |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 302.50' @ 0.00 hrs Surf.Area= 40 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 0.0 min (1,122.2 - 1,122.2)

| Volume         | Invert               | Avail.Sto            | orage  | Storage Descriptio  | n  |   |              |
|----------------|----------------------|----------------------|--|---|--|---|--------------|
| #1             | 302.50'              |                      | 16 cf  | <b>Custom Stage Da</b><br>40 cf Overall x 40.   | <b>ta (Irregular)</b> Liste<br>0% Voids  | d below (Recalc)  |              |
| Elevatio       | on Su<br>et)         | rf.Area F<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft <u>)</u>   |              |
| 302.5<br>303.5 | 50<br>50             | 40<br>40             | 44.0<br>44.0   | 0<br>40   | 0<br>40  | 40<br>84  |              |
| Device         | Routing              | Invert               | Outle  | et Devices  |  |   |              |
| #1<br>#2       | Discarded<br>Primary | 302.50'<br>303.40'   | <b>2.41</b><br><b>20.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40 (<br>3.00 3.50 4.00 4.<br>f. (English) 2.38 2.5<br>2.72 2.73 2.76 2.5 | over Surface are<br>th Broad-Crested<br>0.60 0.80 1.00 1<br>.50 5.00 5.50<br>54 2.69 2.68 2.6<br>.79 2.88 3.07 3.3 | <b>a</b><br>  <b>Rectangular Weir</b><br>.20 1.40 1.60 1.80<br>7 2.67 2.65 2.66 2<br>32 | 2.00<br>2.66 |

**Discarded OutFlow** Max=0.0 cfs @ 16.53 hrs HW=302.50' (Free Discharge) **1=Exfiltration** (Passes 0.0 cfs of 0.0 cfs potential flow)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=302.50' TW=0.00' (Dynamic Tailwater) ←2=Broad-Crested Rectangular Weir (Controls 0.0 cfs)

# Summary for Link AP1:

| Inflow A | Area : | = | 224,752 sf, | 11.85% Impervious, | Inflow Depth > 0. | 00" for 1 Inch event    |
|----------|--------|---|-------------|--------------------|-------------------|-------------------------|
| Inflow   | =      | = | 0.0 cfs @   | 12.12 hrs, Volume= | 71 cf             |                         |
| Primary  | / =    | = | 0.0 cfs @   | 12.12 hrs, Volume= | 71 cf,            | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

# Summary for Link AP2:

| Inflow Are | ea = | 42,170 sf, | 25.53% Impervious, | Inflow Depth > | 0.02"    | for 1 Inch event     |
|------------|------|------------|--------------------|----------------|----------|----------------------|
| Inflow     | =    | 0.0 cfs @  | 16.54 hrs, Volume= | 74 0           | of       |                      |
| Primary    | =    | 0.0 cfs @  | 16.54 hrs, Volume= | 74 0           | of, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

### **Summary for Link AP3:**

| Inflow A | rea = | 196,746 sf, | 5.32% Impervious,  | Inflow Depth > | 0.00"    | for 1 Inch event     |
|----------|-------|-------------|--------------------|----------------|----------|----------------------|
| Inflow   | =     | 0.0 cfs @   | 24.00 hrs, Volume= | 40             | cf       |                      |
| Primary  | =     | 0.0 cfs @   | 24.00 hrs, Volume= | 40             | cf, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

## Summary for Link AP4:

| Inflow Are | a = | 14,618 sf, | 41.41% Impervious, | Inflow Depth > 0.14" | for 1 Inch event     |
|------------|-----|------------|--------------------|----------------------|----------------------|
| Inflow     | =   | 0.0 cfs @  | 12.22 hrs, Volume= | 165 cf               |                      |
| Primary    | =   | 0.0 cfs @  | 12.22 hrs, Volume= | 165 cf, Atte         | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 2-Year Rainfall=3.16"              |
| Prepared by Goldsmith, Prest & Ringwall, Inc.      | Printed 7/14/2020                               |
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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.1:  | Runoff Area=54,522 sf  14.68% Impervious  Runoff Depth>1.12"<br>Flow Length=549'  Tc=7.5 min  CN=76  Runoff=1.5 cfs  5,093 cf       |
|---------------------|---|
| Subcatchment SC1.2: | Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>1.01"<br>Flow Length=510' Tc=6.7 min CN=74 Runoff=2.8 cfs 9,709 cf             |
| SubcatchmentSC1.3:  | Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>2.81"<br>Tc=5.0 min CN=97 Runoff=0.4 cfs 1,322 cf                               |
| SubcatchmentSC1.4:  | Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>2.92"<br>Tc=5.0 min CN=98 Runoff=0.1 cfs 538 cf                                |
| SubcatchmentSC1.5:  | Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>0.85"<br>Flow Length=337' Tc=6.4 min CN=71 Runoff=0.9 cfs 3,282 cf              |
| SubcatchmentSC1.6:  | Runoff Area=622 sf 100.00% Impervious Runoff Depth>2.92"<br>Tc=5.0 min CN=98 Runoff=0.0 cfs 152 cf                                  |
| SubcatchmentSC2.1:  | Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>1.72"<br>Flow Length=68' Tc=5.0 min CN=85 Runoff=0.2 cfs 535 cf                 |
| Subcatchment SC2.2: | Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>1.01"<br>Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=0.9 cfs 3,231 cf |
| SubcatchmentSC3.1:  | Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>0.95"<br>Flow Length=564' Tc=10.4 min CN=73 Runoff=1.3 cfs 5,311 cf             |
| SubcatchmentSC3.2:  | Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>0.85"<br>Flow Length=378' Tc=10.1 min CN=71 Runoff=0.9 cfs 3,901 cf             |
| SubcatchmentSC3.3:  | Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>0.85"<br>Flow Length=287' Tc=10.8 min CN=71 Runoff=1.0 cfs 4,424 cf             |
| SubcatchmentSC3.4:  | Runoff Area=12,347 sf  50.11% Impervious  Runoff Depth>1.80"<br>Flow Length=246'  Tc=5.0 min  CN=86  Runoff=0.6 cfs  1,850 cf       |
| SubcatchmentSC4.1:  | Runoff Area=4,504 sf   4.43% Impervious   Runoff Depth>1.01"<br>Flow Length=64'   Tc=5.0 min   CN=74   Runoff=0.1 cfs  379 cf       |
| SubcatchmentSC4.2:  | Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>1.79"<br>Flow Length=75' Tc=12.7 min CN=86 Runoff=0.4 cfs 1,511 cf             |
| Pond CB1:           | Peak Elev=298.21' Inflow=0.1 cfs 538 cf<br>12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.1 cfs 538 cf                 |
| Pond CB2:           | Peak Elev=288.54' Inflow=0.4 cfs 1,322 cf<br>12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.4 cfs 1,322 cf               |

| <b>Post-Dev Rev 2</b><br>Prepared by Goldsmith, P | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA<br>NRCC 24-hr D 2-Year Rainfall=3.16"<br>rest & Ringwall, Inc.<br>Printed 7/14/2020<br>Page 42 |
|---|--|
| Pond DCB3:  | Peak Elev=288.21' Storage=1 cf Inflow=2.8 cfs 9,709 cf<br>24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=2.8 cfs 9,708 cf            |
| Pond DCB4:  | Peak Elev=287.97' Storage=1 cf Inflow=1.5 cfs 5,093 cf<br>15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=1.5 cfs 5,093 cf            |
| Pond DCB5:  | Peak Elev=298.25' Inflow=1.3 cfs 5,311 cf<br>21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=1.3 cfs 5,311 cf                         |
| Pond DCB6:  | Peak Elev=298.17' Inflow=0.6 cfs 1,850 cf<br>21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.6 cfs 1,849 cf                          |
| Pond DCB7:  | Peak Elev=298.18' Inflow=0.9 cfs 3,901 cf<br>18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=0.9 cfs 3,901 cf                          |
| Pond DMH1:  | Peak Elev=287.87' Inflow=3.3 cfs 11,569 cf<br>24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=3.3 cfs 11,569 cf                       |
| Pond DMH2:  | Peak Elev=298.18' Inflow=1.7 cfs 7,160 cf<br>30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=1.7 cfs 7,160 cf                          |
| Pond IC-1:  | Peak Elev=285.56' Storage=4,603 cf Inflow=4.7 cfs 16,661 cf<br>Discarded=0.1 cfs 6,442 cf Primary=1.7 cfs 5,704 cf Outflow=1.8 cfs 12,146 cf   |
| Pond IC-2:  | Peak Elev=298.16' Storage=2,126 cf Inflow=2.6 cfs 11,061 cf<br>Discarded=0.1 cfs 4,048 cf Primary=1.9 cfs 5,046 cf Outflow=1.9 cfs 9,094 cf    |
| Pond SD-1:  | Peak Elev=300.91' Storage=40 cf Inflow=0.2 cfs 535 cf<br>Discarded=0.0 cfs 310 cf Primary=0.2 cfs 225 cf Outflow=0.2 cfs 535 cf                |
| Pond SD-2:  | Peak Elev=303.42' Storage=15 cf Inflow=0.1 cfs 379 cf<br>Discarded=0.0 cfs 108 cf Primary=0.1 cfs 257 cf Outflow=0.1 cfs 364 cf                |
| Link AP1:   | Inflow=2.1 cfs 9,137 cf<br>Primary=2.1 cfs 9,137 cf  |
| Link AP2:   | Inflow=1.1 cfs 3,456 cf<br>Primary=1.1 cfs 3,456 cf  |
| Link AP3:   | Inflow=2.7 cfs  9,469 cf<br>Primary=2.7 cfs  9,469 cf  |
| Link AP4:   | Inflow=0.4 cfs 1,768 cf<br>Primary=0.4 cfs 1,768 cf  |

Total Runoff Area = 478,286 sf Runoff Volume = 41,236 cf Average Runoff Depth = 1.03" 88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 2-Year Rainfall=3.16"              |
| Prepared by Goldsmith, Prest & Ringwall, Inc.      | Printed 7/14/2020                               |
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# Summary for Subcatchment SC1.1:

| Runoff      | = | 1.5 cfs @ | 12.15 hrs, | Volume= | 5,093 cf, Depth> | 1.12" |
|-------------|---|-----------|------------|---------|------------------|-------|
| 1 Controlli |   |           |            |         |                  |       |

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A     | rea (sf) | CN [    | Description |              |                                    |
|-------|----------|---------|-------------|--------------|------------------------------------|
|       | 24,785   | 74 >    | >75% Gras   | s cover, Go  | ood, HSG C                         |
|       | 21,721   | 70 \    | Noods, Go   | od, HSG C    |                                    |
|       | 14       | 89 (    | Gravel road | ls, HSG C    |                                    |
|       | 6,226    | 98 F    | Paved park  | ing, HSG C   |                                    |
|       | 1,776    | 98 F    | Roofs, HSC  | Э Č          |                                    |
|       | 54,522   | 76 \    | Neighted A  | verage       |                                    |
|       | 46,520   | 8       | 35.32% Pei  | vious Area   |                                    |
|       | 8,002    |         | 14.68% Imp  | pervious Are | ea                                 |
|       |          |         |             |              |                                    |
| Tc    | Length   | Slope   | Velocity    | Capacity     | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                    |
| 0.9   | 50       | 0.0100  | 0.90        |              | Sheet Flow,                        |
|       |          |         |             |              | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 35       | 0.0200  | 2.87        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Paved Kv= 20.3 fps                 |
| 0.6   | 50       | 0.0345  | 1.30        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 1.5   | 180      | 0.1550  | 1.97        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Woodland Kv= 5.0 fps               |
| 4.3   | 234      | 0.0170  | 0.91        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 7.5   | 549      | Total   |             |              |                                    |

# Summary for Subcatchment SC1.2:

| Runoff = | 2.8 cfs @ | 12.14 hrs, | Volume= | 9,709 cf, Depth> 1.0 | )1" |
|----------|-----------|------------|---------|----------------------|-----|
|----------|-----------|------------|---------|----------------------|-----|

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 46,703    | 74 | >75% Grass cover, Good, HSG C |
| 57,729    | 70 | Woods, Good, HSG C            |
| 967       | 89 | Gravel roads, HSG C           |
| 313       | 98 | Unconnected pavement, HSG C   |
| 7,362     | 98 | Paved parking, HSG C          |
| 2,449     | 98 | Roofs, HSG C                  |
| 115,523   | 74 | Weighted Average              |
| 105,398   |    | 91.24% Pervious Area          |
| 10,124    |    | 8.76% Impervious Area         |
| 313       |    | 3.09% Unconnected             |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                     |
|-------------|------------------|------------------|----------------------|-------------------|---------------------------------|
| 3.6         | 50               | 0.0600           | 0.23                 |                   | Sheet Flow,                     |
|             |                  |                  |                      |                   | Grass: Short n= 0.150 P2= 3.16" |
| 1.3         | 167              | 0.0988           | 2.20                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 0.8         | 117              | 0.1200           | 2.42                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 1.0         | 176              | 0.0400           | 3.00                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Grassed Waterway Kv= 15.0 fps   |
| 6.7         | 510              | Total            |                      |                   |                                 |

# Summary for Subcatchment SC1.3:

| Runoff | = | 0.4 cfs @ | 12.12 hrs, Volume= | 1,322 cf, Depth> 2.81" |
|--------|---|-----------|--------------------|------------------------|
|        |   |           |                    | .,                     |

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A     | rea (sf) | CN     | Description |              |               |
|-------|----------|--------|-------------|--------------|---------------|
|       | 162      | 74     | >75% Gras   | s cover, Go  | bod, HSG C    |
|       | 243      | 89     | Gravel road | ls, HSG C    |               |
|       | 5,233    | 98     | Paved park  | ing, HSG C   |               |
|       | 5,639    | 97     | Weighted A  | verage       |               |
|       | 405      |        | 7.19% Perv  | vious Area   |               |
|       | 5,233    |        | 92.81% Imp  | pervious Are | ea            |
|       |          |        |             |              |               |
| Тс    | Length   | Slope  | e Velocity  | Capacity     | Description   |
| (min) | (feet)   | (ft/ft | ) (ft/sec)  | (cfs)        |               |
| 5.0   |          |        |             |              | Direct Entry, |
|       |          |        |             |              |               |
|       |          |        | •           | -            |               |

## Summary for Subcatchment SC1.4:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 538 cf, Depth> 2.92"

| Α           | rea (sf)         | CN I             | Description          |                   |               |  |
|-------------|------------------|------------------|----------------------|-------------------|---------------|--|
|             | 2,208            | 98 I             | Paved park           | ing, HSG C        |               |  |
|             | 2,208            |                  | 100.00% In           | npervious A       | ea            |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |  |
| 5.0         |                  |                  |                      |                   | Direct Entry, |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 2-Year Rainfall=3.16"              |
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#### Summary for Subcatchment SC1.5:

Runoff = 0.9 cfs @ 12.14 hrs, Volume= 3,282 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A        | rea (sf) | CN      | Description        |             |                                 |  |  |
|----------|----------|---------|--------------------|-------------|---------------------------------|--|--|
|          | 37,139   | 70      | Woods, Good, HSG C |             |                                 |  |  |
|          | 441      | 98      | Unconnecte         | ed pavemer  | nt, HSG C                       |  |  |
|          | 8,658    | 74 :    | >75% Gras          | s cover, Go | bod, HSG C                      |  |  |
|          | 46,238   | 71      | Weighted A         | verage      |                                 |  |  |
|          | 45,797   | 9       | 99.05% Pei         | vious Area  |                                 |  |  |
|          | 441      | (       | 0.95% Impe         | ervious Are | a                               |  |  |
|          | 441      |         | 100.00% Ui         | nconnected  | 1                               |  |  |
|          |          |         |                    |             |                                 |  |  |
| Тс       | Length   | Slope   | Velocity           | Capacity    | Description                     |  |  |
| (min)    | (feet)   | (ft/ft) | (ft/sec)           | (cfs)       |                                 |  |  |
| 3.3      | 50       | 0.0800  | 0.26               |             | Sheet Flow,                     |  |  |
|          |          |         |                    |             | Grass: Short n= 0.150 P2= 3.16" |  |  |
| 3.1      | 287      | 0.0941  | 1.53               |             | Shallow Concentrated Flow,      |  |  |
|          |          |         |                    |             | Woodland Kv= 5.0 fps            |  |  |
| <u> </u> | 007      | Tatal   |                    |             |                                 |  |  |

6.4 337 Total

#### Summary for Subcatchment SC1.6:

Runoff = 0.0 cfs @ 12.12 hrs, Volume=

152 cf, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A     | rea (sf) | CN      | Description             |          |               |  |  |
|-------|----------|---------|-------------------------|----------|---------------|--|--|
|       | 622      | 98      | 98 Paved parking, HSG C |          |               |  |  |
|       | 622      |         | 100.00% Impervious Area |          |               |  |  |
|       |          |         |                         |          |               |  |  |
| Tc    | Length   | Slope   | Velocity                | Capacity | Description   |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                | (cfs)    |               |  |  |
| 5.0   |          |         |                         |          | Direct Entry, |  |  |
|       |          |         |                         |          | • *           |  |  |

# Summary for Subcatchment SC2.1:

Runoff = 0.2 cfs @ 12.12 hrs, Volume= 535 cf, Depth> 1.72"

Description Area (sf) CN 1,953 >75% Grass cover, Good, HSG C 74 1,776 98 Roofs, HSG C 3,729 85 Weighted Average 1,953 52.37% Pervious Area 47.63% Impervious Area 1,776 Tc Length Slope Velocity Capacity Description (ft/ft) (min) (feet) (ft/sec) (cfs) 4.3 50 0.0400 0.19 Sheet Flow, Grass: Short n= 0.150 P2= 3.16" 0.2 18 0.0300 1.21 Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps 4.5 68 Total, Increased to minimum Tc = 5.0 min Summary for Subcatchment SC2.2: Runoff 0.9 cfs @ 12.14 hrs, Volume= 3,231 cf, Depth> 1.01" = Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

|   | A     | rea (sf) | CN /                 | Adj Desc                      | Description                   |                                 |  |
|---|-------|----------|----------------------|-------------------------------|-------------------------------|---------------------------------|--|
|   |       | 7,180    | 74                   | >75% Grass cover, Good, HSG C |                               |                                 |  |
|   |       | 22,269   | 70                   | Woo                           | ds, Good, I                   | HSG C                           |  |
| _ |       | 8,992    | 98                   | Unco                          | onnected pa                   | avement, HSG C                  |  |
|   |       | 38,441   | 77                   | 74 Weig                       | Weighted Average, UI Adjusted |                                 |  |
|   |       | 29,449   | 76.61% Pervious Área |                               |                               |                                 |  |
|   |       | 8,992    |                      | 23.3                          | 9% Impervi                    | ous Area                        |  |
|   |       | 8,992    |                      | 100.                          | 00% Uncor                     | nnected                         |  |
|   |       |          |                      |                               |                               |                                 |  |
|   | Тс    | Length   | Slope                | Velocity                      | Capacity                      | Description                     |  |
|   | (min) | (feet)   | (ft/ft)              | (ft/sec)                      | (cfs)                         |                                 |  |
|   | 5.7   | 50       | 0.0200               | 0.15                          |                               | Sheet Flow,                     |  |
|   |       |          |                      |                               |                               | Grass: Short n= 0.150 P2= 3.16" |  |
|   | 0.2   | 29       | 0.1700               | 2.89                          |                               | Shallow Concentrated Flow,      |  |
|   |       |          |                      |                               |                               | Short Grass Pasture Kv= 7.0 fps |  |
|   | 0.5   | 61       | 0.1800               | 2.12                          |                               | Shallow Concentrated Flow,      |  |
| _ |       |          |                      |                               |                               | Woodland Kv= 5.0 fps            |  |
|   | ~ 4   | 4 4 0    | T . 4 . 1            |                               |                               |                                 |  |

Total 6.4 140

# Summary for Subcatchment SC3.1:

Runoff 1.3 cfs @ 12.19 hrs, Volume= 5,311 cf, Depth> 0.95" =

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| A     | rea (sf) | CN I    | Description                      |              |                                 |  |
|-------|----------|---------|----------------------------------|--------------|---------------------------------|--|
|       | 32,168   | 74 :    | 74 >75% Grass cover, Good, HSG C |              |                                 |  |
|       | 31,971   | 70      | Noods, Go                        | od, HSG C    |                                 |  |
|       | 364      | 89      | Gravel road                      | ls, HSG C    |                                 |  |
|       | 55       | 98      | Paved park                       | ing, HSG C   |                                 |  |
|       | 2,321    | 98      | Roofs, HSC                       | G C          |                                 |  |
|       | 66,880   | 73      | Neighted A                       | verage       |                                 |  |
|       | 64,504   | 9       | 96.45% Pei                       | vious Area   |                                 |  |
|       | 2,376    |         | 3.55% Impe                       | ervious Area | а                               |  |
| _     |          |         |                                  |              |                                 |  |
| TC    | Length   | Slope   | Velocity                         | Capacity     | Description                     |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                 |  |
| 5.7   | 50       | 0.0200  | 0.15                             |              | Sheet Flow,                     |  |
|       |          |         |                                  |              | Grass: Short n= 0.150 P2= 3.16" |  |
| 2.1   | 247      | 0.0800  | 1.98                             |              | Shallow Concentrated Flow,      |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps |  |
| 1.5   | 133      | 0.0830  | 1.44                             |              | Shallow Concentrated Flow,      |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps            |  |
| 1.1   | 134      | 0.0820  | 2.00                             |              | Shallow Concentrated Flow,      |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps |  |

10.4 564 Total

# **Summary for Subcatchment SC3.2:**

Runoff = 0.9 cfs @ 12.18 hrs, Volume=

3,901 cf, Depth> 0.85"

|   | Α     | rea (sf) | CN      | Description                      |              |  |  |  |
|---|-------|----------|---------|----------------------------------|--------------|--|--|--|
|   |       | 12,832   | 74 :    | 74 >75% Grass cover, Good, HSG C |              |  |  |  |
|   |       | 880      | 98      | Roofs, HSG C                     |              |  |  |  |
|   |       | 41,349   | 70      | Woods, Good, HSG C               |              |  |  |  |
|   |       | 55,060   | 71      |                                  |              |  |  |  |
|   |       | 54,180   | 9       | 98.40% Pei                       | vious Area   |  |  |  |
|   |       | 880      |         | 1.60% Impe                       | ervious Area | а  |  |  |
|   |       |          |         |                                  |              |  |  |  |
|   | Тс    | Length   | Slope   | Velocity                         | Capacity     | Description                                |  |  |
| _ | (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |  |  |  |
|   | 7.1   | 50       | 0.0800  | 0.12                             |              | Sheet Flow,                                |  |  |
|   |       |          |         |                                  |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |
|   | 1.7   | 204      | 0.1600  | 2.00                             |              | Shallow Concentrated Flow,                 |  |  |
|   |       |          |         |                                  |              | Woodland Kv= 5.0 fps                       |  |  |
|   | 1.3   | 124      | 0.0530  | 1.61                             |              | Shallow Concentrated Flow,                 |  |  |
|   |       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps            |  |  |
|   | 10.1  | 378      | Total   |                                  |              |  |  |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 2-Year Rainfall=3.16"              |
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# Summary for Subcatchment SC3.3:

Runoff = 1.0 cfs @ 12.19 hrs, Volume= 4,424 cf, Depth> 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| Α           | rea (sf)         | CN [             | CN Description       |                   |   |  |  |  |
|-------------|------------------|------------------|----------------------|-------------------|---|--|--|--|
|             | 12,393           | 74 >             | >75% Gras            | s cover, Go       | ood, HSG C  |  |  |  |
|             | 49,047           | 70 \             | Noods, Go            | od, HSG C         |   |  |  |  |
|             | 1,019            | 98 l             | Jnconnecte           | ed pavemer        | nt, HSG C   |  |  |  |
|             | 62,459           | 71 \             | Neighted A           | verage            |   |  |  |  |
|             | 61,440           | ę                | 98.37% Pei           | vious Area        |   |  |  |  |
|             | 1,019            |                  | 1.63% Impe           | ervious Area      | a   |  |  |  |
|             | 1,019            | -                | 100.00% U            | nconnected        | 1   |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |  |  |  |
| 8.6         | 50               | 0.0500           | 0.10                 |                   | Sheet Flow,   |  |  |  |
| 2.2         | 237              | 0.1350           | 1.84                 |                   | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |  |  |  |
| 10.8        | 287              | Total            |                      |                   |   |  |  |  |

# Summary for Subcatchment SC3.4:

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 1,850 cf, Depth> 1.80"

| A            | rea (sf) | CN [    | Description |              |                                    |
|--------------|----------|---------|-------------|--------------|------------------------------------|
|              | 5,554    | 74 >    | >75% Gras   | s cover, Go  | ood, HSG C                         |
|              | 529      | 70 \    | Voods, Go   | od, HSG C    |                                    |
|              | 76       | 89 (    | Gravel road | s, HSG C     |                                    |
|              | 6,187    | 98 F    | Paved park  | ing, HSG C   |                                    |
|              | 12,347   | 86 \    | Veighted A  | verage       |                                    |
|              | 6,159    | 2       | 19.89% Per  | vious Area   |                                    |
|              | 6,187    | Ę       | 50.11% Imp  | pervious Are | ea                                 |
|              |          |         |             |              |                                    |
| Тс           | Length   | Slope   | Velocity    | Capacity     | Description                        |
| <u>(min)</u> | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                    |
| 1.3          | 113      | 0.0200  | 1.40        |              | Sheet Flow,                        |
|              |          |         |             |              | Smooth surfaces n= 0.011 P2= 3.16" |
| 2.4          | 38       | 0.1000  | 0.27        |              | Sheet Flow,                        |
|              |          |         |             |              | Grass: Short n= 0.150 P2= 3.16"    |
| 0.9          | 95       | 0.0600  | 1.71        |              | Shallow Concentrated Flow,         |
|              |          |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 4.6          | 246      | Total,  | Increased t | o minimum    | Tc = 5.0 min                       |

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## Summary for Subcatchment SC4.1:

Runoff = 0.1 cfs @ 12.13 hrs, Volume= 379 cf, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 2-Year Rainfall=3.16"

| A     | rea (sf) | CN     | Description          |             |                                 |  |  |
|-------|----------|--------|----------------------|-------------|---------------------------------|--|--|
|       | 1,020    | 70     | 0 Woods, Good, HSG C |             |                                 |  |  |
|       | 200      | 98     | Unconnecte           | ed pavemer  | nt, HSG C                       |  |  |
|       | 3,285    | 74     | >75% Gras            | s cover, Go | bod, HSG C                      |  |  |
|       | 4,504    | 74     | Weighted A           | verage      |                                 |  |  |
|       | 4,305    |        | 95.57% Pei           | vious Area  |                                 |  |  |
|       | 200      |        | 4.43% Impe           | ervious Are | а                               |  |  |
|       | 200      |        | 100.00% U            | nconnected  | 1                               |  |  |
|       |          |        |                      |             |                                 |  |  |
| Тс    | Length   | Slope  | e Velocity           | Capacity    | Description                     |  |  |
| (min) | (feet)   | (ft/ft | ) (ft/sec)           | (cfs)       |                                 |  |  |
| 3.6   | 50       | 0.0600 | 0.23                 |             | Sheet Flow,                     |  |  |
|       |          |        |                      |             | Grass: Short n= 0.150 P2= 3.16" |  |  |
| 0.2   | 14       | 0.0400 | ) 1.40               |             | Shallow Concentrated Flow,      |  |  |
|       |          |        |                      |             | Short Grass Pasture Kv= 7.0 fps |  |  |
| 3.8   | 64       | Total, | Increased t          | o minimum   | 1 Tc = 5.0 min                  |  |  |

# **Summary for Subcatchment SC4.2:**

Runoff = 0.4 cfs @ 12.20 hrs, Volume= 1,511 cf, Depth> 1.79"

| A            | rea (sf) | CN [            | Description           |              |   |  |  |
|--------------|----------|-----------------|-----------------------|--------------|---|--|--|
|              | 3,927    | 70 \            | 70 Woods, Good, HSG C |              |   |  |  |
|              | 5,854    | 98 l            | Jnconnecte            | ed pavemer   | nt, HSG C   |  |  |
|              | 333      | 74 >            | -75% Gras             | s cover, Go  | ood, HSG C  |  |  |
|              | 10,114   | 86 \            | Veighted A            | verage       |   |  |  |
|              | 4,260    | 2               | 2.12% Per             | vious Area   |   |  |  |
|              | 5,854    | 5               | 57.88% Imp            | pervious Are | ea  |  |  |
|              | 5,854    |                 | 00.00% Ui             | nconnected   | 1   |  |  |
|              |          |                 |                       |              |   |  |  |
| Тс           | Length   | Slope           | Velocity              | Capacity     | Description   |  |  |
| <u>(min)</u> | (feet)   | (ft/ft)         | (ft/sec)              | (cfs)        |   |  |  |
| 12.4         | 50       | 0.0200          | 0.07                  |              | Sheet Flow.   |  |  |
|              |          |                 |                       |              | •••.  |  |  |
|              |          |                 |                       |              | Woods: Light underbrush n= 0.400 P2= 3.16"  |  |  |
| 0.3          | 25       | 0.0800          | 1.41                  |              | Woods: Light underbrush n= 0.400 P2= 3.16"<br>Shallow Concentrated Flow,                                |  |  |
| 0.3          | 25       | 0.0800          | 1.41                  |              | Woods: Light underbrush n= 0.400 P2= 3.16"<br>Shallow Concentrated Flow,<br>Woodland Kv= 5.0 fps        |  |  |
| 0.3          | 25<br>75 | 0.0800<br>Total | 1.41                  |              | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |  |  |

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# Summary for Pond CB1:

| Inflow Are | a = | 2,208 sf,100.00% Impervious, | Inflow Depth > 2.92" for 2-Year event |
|------------|-----|------------------------------|---------------------------------------|
| Inflow     | =   | 0.1 cfs @ 12.12 hrs, Volume= | 538 cf                                |
| Outflow    | =   | 0.1 cfs @ 12.12 hrs, Volume= | 538 cf, Atten= 0%, Lag= 0.0 min       |
| Primary    | =   | 0.1 cfs @ 12.12 hrs, Volume= | 538 cf                                |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.21' @ 12.12 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 298.00' | <b>12.0" Round Culvert</b><br>L= 220.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=298.21' TW=287.85' (Dynamic Tailwater) -1=Culvert (Inlet Controls 0.1 cfs @ 1.23 fps)

## Summary for Pond CB2:

| Inflow Are | ea = | 5,639 sf, | 92.81% Impervious, | Inflow Depth > 2 | 2.81" for 2-Year event  |     |
|------------|------|-----------|--------------------|------------------|-------------------------|-----|
| Inflow     | =    | 0.4 cfs @ | 12.12 hrs, Volume= | 1,322 cf         |                         |     |
| Outflow    | =    | 0.4 cfs @ | 12.12 hrs, Volume= | 1,322 cf         | , Atten= 0%, Lag= 0.0 m | nin |
| Primary    | =    | 0.4 cfs @ | 12.12 hrs, Volume= | 1,322 cf         | -                       |     |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.54' @ 12.12 hrs Flood Elev= 292.30'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 288.20' | 12.0" Round Culvert  |
|        |         |         | L= 5.0' CPP, projecting, no headwall, Ke= 0.900                  |
|        |         |         | Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf      |

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=288.54' TW=287.85' (Dynamic Tailwater) ←1=Culvert (Barrel Controls 0.4 cfs @ 2.33 fps)

## Summary for Pond DCB3:

| Inflow Area | a = | 115,523 sf, | 8.76% Impervious,  | Inflow Depth > 1.0 | 1" for 2-Year event     |
|-------------|-----|-------------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 2.8 cfs @   | 12.14 hrs, Volume= | 9,709 cf           |                         |
| Outflow     | =   | 2.8 cfs @   | 12.14 hrs, Volume= | 9,708 cf, 7        | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 2.8 cfs @   | 12.14 hrs, Volume= | 9,708 cf           |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

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Peak Elev= 288.21' @ 12.14 hrs Surf.Area= 1 sf Storage= 1 cf Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 0.0 min calculated for 9,708 cf (100% of inflow) Center-of-Mass det. time= 0.0 min ( 895.0 - 895.0 )

| Volume           | Inv       | ert Avai                                       | il.Storage       | Storage Description  | on  |   |               |
|------------------|-----------|--|------------------|--|---|---|---------------|
| #1               | 287.      | 00'  | 310 cf           | Custom Stage Da  | <b>ata (Irregular)</b> List                                   | ed below (Recalc)   |               |
| Elevatio<br>(fee | on<br>et) | Surf.Area<br>(sq-ft)                           | Perim.<br>(feet) | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)                                     | Wet.Area<br>(sq-ft <u>)</u>                               |               |
| 287.0            | 0         | 1  | 1.0              | 0  | 0   | 1   |               |
| 288.0            | 0         | 1  | 1.0              | 1  | 1   | 2   |               |
| 289.0            | 0         | 1  | 1.0              | 1  | 2   | 3   |               |
| 290.0            | 0         | 1  | 1.0              | 1  | 3   | 4   |               |
| 291.0            | 0         | 89   | 87.5             | 33   | 36  | 615   |               |
| 292.0            | 00        | 519  | 180.8            | 274  | 310   | 2,611   |               |
| Device           | Routing   | In   | vert Outle       | et Devices   |   |   |               |
| #1               | Primary   | y 287.34' <b>24.0</b><br>L= 1<br>Inlet<br>n= 0 |                  | <b>" Round Culvert</b><br>2.0' CPP, projecti<br>/ Outlet Invert= 28<br>.013 Corrugated P | ng, no headwall,<br>7.34' / 287.10' S=<br>'E, smooth interior | Ke= 0.900<br>= 0.0200 '/'    Cc= 0<br>-,  Flow Area= 3.14 | ).900<br>4 sf |

Primary OutFlow Max=2.8 cfs @ 12.14 hrs HW=288.20' TW=287.87' (Dynamic Tailwater) -1=Culvert (Outlet Controls 2.8 cfs @ 3.18 fps)

# Summary for Pond DCB4:

| Inflow Area | a = | 54,522 sf, | 14.68% Impervious, | Inflow Depth > 1 | 1.12" for  | 2-Year event    |
|-------------|-----|------------|--------------------|------------------|------------|-----------------|
| Inflow      | =   | 1.5 cfs @  | 12.15 hrs, Volume= | 5,093 cf         |            |                 |
| Outflow     | =   | 1.5 cfs @  | 12.15 hrs, Volume= | 5,093 cf         | , Atten= 0 | %, Lag= 0.0 min |
| Primary     | =   | 1.5 cfs @  | 12.15 hrs, Volume= | 5,093 cf         |            | -               |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.97' @ 12.15 hrs Surf.Area= 1 sf Storage= 1 cf Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 0.1 min calculated for 5,088 cf (100% of inflow) Center-of-Mass det. time= 0.0 min (887.4 - 887.4)

| Volume              | Invert    | Avail           | .Storage         | Storage Description       | ]                         |                             |
|---------------------|-----------|-----------------|------------------|---------------------------|---------------------------|-----------------------------|
| #1                  | 287.00'   |                 | 250 cf           | Custom Stage Dat          | a (Irregular)Listed       | below (Recalc)              |
| Elevation<br>(feet) | Surf<br>( | .Area<br>sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
| 287.00              |           | 1               | 1.0              | 0                         | 0                         | 1                           |
| 288.00              |           | 1               | 1.0              | 1                         | 1                         | 2                           |
| 289.00              |           | 1               | 1.0              | 1                         | 2                         | 3                           |
| 290.00              |           | 1               | 1.0              | 1                         | 3                         | 4                           |
| 291.00              |           | 714             | 132.0            | 247                       | 250                       | 1,392                       |

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.25' | <b>15.0" Round Culvert</b><br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=1.4 cfs @ 12.15 hrs HW=287.96' TW=284.63' (Dynamic Tailwater) **1=Culvert** (Barrel Controls 1.4 cfs @ 2.87 fps)

## Summary for Pond DCB5:

| Inflow Area | ı = | 66,880 sf, | 3.55% Impervious,  | Inflow Depth > 0.9 | 95" for 2-Year event    |
|-------------|-----|------------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 1.3 cfs @  | 12.19 hrs, Volume= | 5,311 cf           |                         |
| Outflow     | =   | 1.3 cfs @  | 12.19 hrs, Volume= | 5,311 cf,          | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 1.3 cfs @  | 12.19 hrs, Volume= | 5,311 cf           |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.25' @ 12.26 hrs Flood Elev= 302.50'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.42' | 21.0" Round Culvert  |
|        | -       |         | L= 47.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |         |         | Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf      |

Primary OutFlow Max=0.9 cfs @ 12.19 hrs HW=298.07' TW=297.93' (Dynamic Tailwater) **1=Culvert** (Outlet Controls 0.9 cfs @ 1.69 fps)

#### Summary for Pond DCB6:

| Inflow Are | ea = | 12,347 sf, | 50.11% Impervious, | Inflow Depth > 1.8 | 0" for 2-Year event     |
|------------|------|------------|--------------------|--------------------|-------------------------|
| Inflow     | =    | 0.6 cfs @  | 12.12 hrs, Volume= | 1,850 cf           |                         |
| Outflow    | =    | 0.6 cfs @  | 12.12 hrs, Volume= | 1,849 cf, <i>I</i> | Atten= 0%, Lag= 0.0 min |
| Primary    | =    | 0.6 cfs @  | 12.12 hrs, Volume= | 1,849 cf           | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.17' @ 12.28 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>21.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=297.54' TW=297.53' (Dynamic Tailwater) -1=Culvert (Outlet Controls 0.3 cfs @ 0.66 fps)
# Summary for Pond DCB7:

| Inflow Are | a = | 55,060 sf, | 1.60% Impervious,  | Inflow Depth > 0.85 | ' for 2-Year event    |
|------------|-----|------------|--------------------|---------------------|-----------------------|
| Inflow     | =   | 0.9 cfs @  | 12.18 hrs, Volume= | 3,901 cf            |                       |
| Outflow    | =   | 0.9 cfs @  | 12.18 hrs, Volume= | 3,901 cf, At        | ten= 0%, Lag= 0.0 min |
| Primary    | =   | 0.9 cfs @  | 12.18 hrs, Volume= | 3,901 cf            | -                     |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.18' @ 12.26 hrs Flood Elev= 302.70'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>18.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |

Primary OutFlow Max=1.0 cfs @ 12.18 hrs HW=297.91' TW=297.86' (Dynamic Tailwater) ←1=Culvert (Inlet Controls 1.0 cfs @ 0.86 fps)

#### Summary for Pond DMH1:

| Inflow Are | a = | 123,370 sf, | 14.24% Impervious, | Inflow Depth > 1.13" | for 2-Year event     |
|------------|-----|-------------|--------------------|----------------------|----------------------|
| Inflow     | =   | 3.3 cfs @   | 12.14 hrs, Volume= | 11,569 cf            |                      |
| Outflow    | =   | 3.3 cfs @   | 12.14 hrs, Volume= | 11,569 cf, Atte      | en= 0%, Lag= 0.0 min |
| Primary    | =   | 3.3 cfs @   | 12.14 hrs, Volume= | 11,569 cf            | -                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.87' @ 12.14 hrs Flood Elev= 292.00'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.00' | <b>24.0" Round Culvert</b><br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

Primary OutFlow Max=3.3 cfs @ 12.14 hrs HW=287.87' TW=284.51' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 3.3 cfs @ 2.51 fps)

#### Summary for Pond DMH2:

| Inflow Area | a = | 79,226 sf, | 10.81% Impervious, | Inflow Depth > | 1.08"    | for 2-Year event   |
|-------------|-----|------------|--------------------|----------------|----------|--------------------|
| Inflow      | =   | 1.7 cfs @  | 12.15 hrs, Volume= | 7,160 c        | f        |                    |
| Outflow     | =   | 1.7 cfs @  | 12.15 hrs, Volume= | 7,160 c        | f, Atten | = 0%, Lag= 0.0 min |
| Primary     | =   | 1.7 cfs @  | 12.15 hrs, Volume= | 7,160 c        | f        |                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

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Peak Elev= 298.18' @ 12.26 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 296.85' | <b>30.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf |

Primary OutFlow Max=1.7 cfs @ 12.15 hrs HW=297.71' TW=297.62' (Dynamic Tailwater) ☐ 1=Culvert (Inlet Controls 1.7 cfs @ 1.16 fps)

# Summary for Pond IC-1:

| Inflow Area | a = | 177,892 sf, | 14.37% Impervious, | Inflow Depth > 1.12 | 2" for 2-Year event      |
|-------------|-----|-------------|--------------------|---------------------|--------------------------|
| Inflow      | =   | 4.7 cfs @   | 12.14 hrs, Volume= | 16,661 cf           |                          |
| Outflow     | =   | 1.8 cfs @   | 12.32 hrs, Volume= | 12,146 cf, A        | tten= 61%, Lag= 11.0 min |
| Discarded   | =   | 0.1 cfs @   | 11.76 hrs, Volume= | 6,442 cf            |                          |
| Primary     | =   | 1.7 cfs @   | 12.32 hrs, Volume= | 5,704 cf            |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 285.56' @ 12.32 hrs Surf.Area= 2,271 sf Storage= 4,603 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 59.0 min (937.4 - 878.5)

| Volume | Invert  | Avail.Storage | Storage Description   |
|--------|---------|---------------|---|
| #1     | 282.40' | 3,658 cf      | IC-1 Stone bed (Irregular)Listed below (Recalc)                 |
|        |         |               | 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids  |
| #2     | 283.40' | 5,002 cf      | ADS_StormTech MC-4500 b +Cap x 44 Inside #1                     |
|        |         |               | Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf |
|        |         |               | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap      |
|        |         |               | 44 Chambers in 4 Rows   |
|        |         |               | Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf                   |
| #3     | 283.00' | 200 cf        | PES-1 Stone bed (Pyramidal)Listed below (Recalc)                |
|        |         |               | 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids         |
| #4     | 283.00' | 126 cf        | 24.0" Round Pipe Storage Inside #3                              |
|        |         |               | L= 40.0'  |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|------------------|---------------------------|---------------------------|-----------------------------|
| 282.40              | 2,021                | 188.0            | 0                         | 0                         | 2,021                       |
| 283.00              | 2,021                | 188.0            | 1,213                     | 1,213                     | 2,134                       |
| 284.00              | 2,021                | 188.0            | 2,021                     | 3,234                     | 2,322                       |
| 285.00              | 2,021                | 188.0            | 2,021                     | 5,255                     | 2,510                       |
| 286.00              | 2,021                | 188.0            | 2,021                     | 7,276                     | 2,698                       |
| 287.00              | 2,021                | 188.0            | 2,021                     | 9,297                     | 2,886                       |
| 288.00              | 2,021                | 188.0            | 2,021                     | 11,318                    | 3,074                       |
| 289.00              | 2,021                | 188.0            | 2,021                     | 13,339                    | 3,262                       |
| 289.40              | 2,021                | 188.0            | 808                       | 14,147                    | 3,337                       |

8,985 cf Total Available Storage

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|---------------------------|---------------------------|-----------------------------|
| 283.00              | 250                  | 0                         | 0                         | 250                         |
| 284.00              | 250                  | 250                       | 250                       | 313                         |
| 285.00              | 250                  | 250                       | 500                       | 376                         |
| 285.50              | 250                  | 125                       | 625                       | 408                         |

| Device | Routing   | Invert  | Outlet Devices   |
|--------|-----------|---------|--|
| #1     | Discarded | 282.40' | 2.410 in/hr Exfiltration over Surface area                       |
| #2     | Primary   | 285.50' | 50.0' long x 2.5' breadth Broad-Crested Rectangular Weir         |
|        |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|        |           |         | 2.50 3.00 3.50 4.00  |
|        |           |         | Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74     |
|        |           |         | 2.76 2.89 3.05 3.19 3.32   |
| #3     | Device 2  | 284.10' | 24.0" Round Culvert  |
|        |           |         | L= 70.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |           |         | Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 |
|        |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf      |
| #4     | Device 3  | 284.10' | 20.0" W x 12.0" H Vert. Orifice/Grate C= 0.600                   |
|        |           |         | Limited to weir flow at low heads                                |
| #5     | Device 3  | 287.00' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |

**Discarded OutFlow** Max=0.1 cfs @ 11.76 hrs HW=283.00' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.7 cfs @ 12.32 hrs HW=285.56' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 1.7 cfs @ 0.59 fps) **3=Culvert** (Passes 1.7 cfs of 2.0 cfs potential flow) **4=Orifice/Grate** (Passes 1.7 cfs of 1.9 cfs potential flow) **5=Sharp-Crested Vee/Trap Weir** (Controls 0.0 cfs)

# Summary for Pond IC-2:

| Inflow Area | a = | 134,287 sf, | 7.03% Impervious,  | Inflow Depth > 0.9 | 9" for 2-Year event      |
|-------------|-----|-------------|--------------------|--------------------|--------------------------|
| Inflow      | =   | 2.6 cfs @   | 12.17 hrs, Volume= | 11,061 cf          |                          |
| Outflow     | =   | 1.9 cfs @   | 12.26 hrs, Volume= | 9,094 cf, A        | Atten= 27%, Lag= 5.9 min |
| Discarded   | =   | 0.1 cfs @   | 11.60 hrs, Volume= | 4,048 cf           | -                        |
| Primary     | =   | 1.9 cfs @   | 12.26 hrs, Volume= | 5,046 cf           |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.16' @ 12.26 hrs Surf.Area= 1,497 sf Storage= 2,126 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 38.2 min ( 933.0 - 894.8 )

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| Volume     | Invert    | Avail.St | orage  | Storage         | e Descriptio  | n              |                   |                             |
|------------|-----------|----------|--------|-----------------|---|----------------|-------------------|-----------------------------|
| #1         | 295.80'   | 2,2      | 234 cf | IC-2 St         | IC-2 Stone bed (Irregular)Listed below (Recalc)               |                |                   |                             |
|            |           |          |        | 8,729 c         | 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids |                |                   |                             |
| #2         | 296.80'   | 3,1      | 143 cf | ADS_S           | tormTech  | MC-4500 b +0   | Cap @ 4.0         | <b>)3' L</b> x 28 Inside #1 |
|            |           |          |        | Effectiv        | e Size= $90$ .  | 4"W x 60.0"H   | => 26.46          | st x $4.03$ 'L = 106.6 ct   |
|            |           |          |        | Overall         | Size= 100.  | 0"W X 60.0"H   | x 4.33'L v        | vith 0.31° Overlap          |
|            |           |          |        | 28 Una          | mbers in 2 i  | Kows           | - 150             | 0 of                        |
| #2         | 206.00    |          | 172 of |                 | Stone bod   | .3  CIXZXZIC   | isted holo        | .U CI<br>w (Pocolo)         |
| #3         | 290.00    |          |        | 500 cf (        | Overall - 71  | cf Embedded    | = 120  cf         | w (Necalc)<br>v 10.0% Voide |
| <b>#</b> 4 | 296.00'   |          | 71 cf  | 18 <b>0</b> " F |   | Storage Insi   | - +29 01<br>de #3 | X 40.070 VOIUS              |
| <i>n</i> – | 200.00    |          | 1101   | L= 40.0         | )'<br>)'  |                |                   |                             |
|            |           | 5,6      | 620 cf | Total A         | vailable Sto  | rage           |                   |                             |
| Elevatio   | on S      | urf.Area | Perim. |                 | Inc.Store   | Cum.Sto        | re                | Wet.Area                    |
| (fee       | et)       | (sq-ft)  | (feet) | (CL             | ubic-feet)  | (cubic-fee     | et)               | (sq-ft)                     |
| 295.8      | 80        | 1.247    | 165.0  |                 | 0   |                | 0                 | 1.247                       |
| 296.0      | 00        | 1,247    | 165.0  |                 | 249   | 24             | 19                | 1,280                       |
| 297.0      | 00        | 1,247    | 165.0  |                 | 1,247   | 1,49           | 96                | 1,445                       |
| 298.0      | 00        | 1,247    | 165.0  |                 | 1,247   | 2,74           | 13                | 1,610                       |
| 299.0      | 00        | 1,247    | 165.0  |                 | 1,247   | 3,99           | 90                | 1,775                       |
| 300.0      | 00        | 1,247    | 165.0  |                 | 1,247   | 5,23           | 37                | 1,940                       |
| 301.0      | 00        | 1,247    | 165.0  |                 | 1,247   | 6,48           | 34                | 2,105                       |
| 302.0      | 00        | 1,247    | 165.0  |                 | 1,247   | 7,73           | 31                | 2,270                       |
| 302.8      | 80        | 1,247    | 165.0  |                 | 998   | 8,72           | 29                | 2,402                       |
| Elevatio   | on S      | urf.Area | Inc    | Store           | Cum.S   | Store \        | Net.Area          |                             |
| (fee       | et)       | (sq-ft)  | (cubi  | c-feet)         | (cubic-   | feet)          | (sq-ft)           |                             |
| 296.0      | 00        | 250      |        | 0               | •   | 0              | 250               |                             |
| 297.0      | 00        | 250      |        | 250             |   | 250            | 313               |                             |
| 298.0      | 00        | 250      |        | 250             |   | 500            | 376               |                             |
| Device     | Routina   | Invert   | Outle  | et Device       | es  |                |                   |                             |
| #1         | Discarded | 295.80'  | 2.41   | 0 in/hr E       | xfiltration   | over Surface   | area              |                             |
| #2         | Primary   | 298.00'  | 50.0   | 'lona x         | 2.0' bread  | th Broad-Cre   | sted Rect         | tangular Weir               |
|            | <b>,</b>  |          | Head   | d (feet)        | 0.20 0.40 (   | 0.60 0.80 1.0  | 0 1.20 1          | .40 1.60 1.80 2.00          |
|            |           |          | 2.50   | 3.00 3.         | .50   |                |                   |                             |
|            |           |          | Coet   | f. (Englis      | h) 2.54 2.6   | 61 2.61 2.60   | 2.66 2.7          | 0 2.77 2.89 2.88            |
|            |           |          | 2.85   | 3.07 3          | .20 3.32  |                |                   |                             |
| #3         | Device 2  | 296.50'  | 18.0   | " Roune         | d Culvert   |                |                   |                             |
|            |           |          | L= 2   | 0.0' CP         | P, projectin  | g, no headwa   | ll, Ke= 0.        | 900                         |
|            |           |          | Inlet  | / Outlet        | Invert= 296   | .50' / 296.00' | S= 0.025          | 50 '/' Cc= 0.900            |
| .11 A      |           |          | n= 0   | .013 Co         | rrugated PE   | =, smooth inte | erior, Flow       | / Area= 1.77 sf             |
| #4         | Device 3  | 296.50   | 23.0   | WX6.            | U" H Vert. (  | Jrifice/Grate  | C= 0.600          | )                           |
| #6         | Dovice 2  | 200.00   |        | leu lo We       | arn Croater   | w neads        | loir Cu- 2        | (C - 2.20)                  |
| #5         | Device 2  | 299.90   | 4.0    | iving əffi      | ai p-0165160  | u vee/iiap W   |                   |                             |

**Discarded OutFlow** Max=0.1 cfs @ 11.60 hrs HW=296.00' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=1.8 cfs @ 12.26 hrs HW=298.16' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Passes 1.8 cfs of 8.1 cfs potential flow) 3=Culvert (Passes 1.8 cfs of 2.7 cfs potential flow) 4=Orifice/Grate (Orifice Controls 1.8 cfs @ 1.92 fps) 5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

# Summary for Pond SD-1:

| Inflow Area | ı = | 3,729 sf, | 47.63% Impervious  | Inflow Depth > 1 | .72" for 2-Year event   |
|-------------|-----|-----------|--------------------|------------------|-------------------------|
| Inflow      | =   | 0.2 cfs @ | 12.12 hrs, Volume= | 535 cf           |                         |
| Outflow     | =   | 0.2 cfs @ | 12.12 hrs, Volume= | 535 cf,          | Atten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 10.86 hrs, Volume= | 310 cf           | -                       |
| Primary     | =   | 0.2 cfs @ | 12.12 hrs, Volume= | 225 cf           |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.91' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 38.6 min ( 886.6 - 848.0 )

| Volume           | Invert               | Avail.S            | torage   | Storage Descriptio  | n  |   |
|------------------|----------------------|--------------------|--|---|--|---|
| #1               | 300.00'              |                    | 44 cf  | Custom Stage Da<br>109 cf Overall x 4   | <b>ita (Irregular)</b> List<br>0.0% Voids                            | ed below (Recalc)   |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft <u>)</u>   |
| 300.0<br>301.0   | 00<br>00             | 109<br>109         | 113.3<br>113.3   | 0<br>109  | 0<br>109   | 109<br>222  |
| Device           | Routing              | Invei              | rt Outle   | et Devices  |  |   |
| #1<br>#2         | Discarded<br>Primary | 300.00<br>300.90   | )' <b>2.41</b><br>)' <b>55.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40<br>3.00 3.50 4.00 4<br>f. (English) 2.38 2.<br>2.72 2.73 2.76 2 | over Surface are<br>th Broad-Creste0.600.801.00.505.00542.692.683.07 | ea<br>d Rectangular Weir<br>1.20 1.40 1.60 1.80 2.00<br>67 2.67 2.65 2.66 2.66<br>.32 |

**Discarded OutFlow** Max=0.0 cfs @ 10.86 hrs HW=300.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.2 cfs @ 12.12 hrs HW=300.91' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 0.2 cfs @ 0.26 fps)

# Summary for Pond SD-2:

| Inflow Area | a = | 4,504 sf, | 4.43% Impervious,  | Inflow Depth > 1.01 | for 2-Year event      |
|-------------|-----|-----------|--------------------|---------------------|-----------------------|
| Inflow      | =   | 0.1 cfs @ | 12.13 hrs, Volume= | 379 cf              |                       |
| Outflow     | =   | 0.1 cfs @ | 12.12 hrs, Volume= | 364 cf, At          | ten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 11.12 hrs, Volume= | 108 cf              | -                     |
| Primary     | =   | 0.1 cfs @ | 12.12 hrs, Volume= | 257 cf              |                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 303.42' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= 27.9 min calculated for 364 cf (96% of inflow) Center-of-Mass det. time= 7.8 min (901.7 - 893.8)

| Volume         | Invert               | Avail.Sto            | rage   | Storage Description   |  |   |
|----------------|----------------------|----------------------|--|---|--|---|
| #1             | 302.50'              |                      | 16 cf  | Custom Stage Data<br>40 cf Overall x 40.0   | <b>a (Irregular)</b> Listed<br>0% Voids  | below (Recalc)  |
| Elevatio       | on Su<br>et)         | rf.Area P<br>(sq-ft) | Perim.<br>(feet)                             | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft)   |
| 302.5<br>303.5 | 50<br>50             | 40<br>40             | 44.0<br>44.0                                 | 0<br>40   | 0<br>40  | 40<br>84  |
| Device         | Routing              | Invert               | Outle  | et Devices  |  |   |
| #1<br>#2       | Discarded<br>Primary | 302.50'<br>303.40'   | 2.41<br>20.0<br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration of</b><br><b>long x 4.0' breadtl</b><br>d (feet) 0.20 0.40 0<br>3.00 3.50 4.00 4.5<br>f. (English) 2.38 2.5<br>2.72 2.73 2.76 2.7 | Ver Surface area     n Broad-Crested F     .60   0.80   1.00   1.2     50   5.00   5.50     4   2.69   2.68   2.67     79   2.88   3.07   3.32 | <b>Rectangular Weir</b><br>20 1.40 1.60 1.80 2.00<br>2.67 2.65 2.66 2.66<br>2 |

**Discarded OutFlow** Max=0.0 cfs @ 11.12 hrs HW=302.51' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.1 cfs @ 12.12 hrs HW=303.42' TW=0.00' (Dynamic Tailwater) ←2=Broad-Crested Rectangular Weir (Weir Controls 0.1 cfs @ 0.32 fps)

# Summary for Link AP1:

| Inflow A | Area | ı = | 224,752 sf, | 11.85% Impervious, | Inflow Depth > | 0.49"   | for 2-Ye   | ar event    |
|----------|------|-----|-------------|--------------------|----------------|---------|------------|-------------|
| Inflow   |      | =   | 2.1 cfs @   | 12.32 hrs, Volume= | 9,137 0        | of      |            |             |
| Primary  | y    | =   | 2.1 cfs @   | 12.32 hrs, Volume= | 9,137 0        | of, Att | en= 0%, La | ag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

# Summary for Link AP2:

| Inflow / | Area | = | 42,170 sf, | 25.53% Imperv   | /ious, | Inflow Depth > | 0.98   | " for 2-` | Year even | t   |
|----------|------|---|------------|-----------------|--------|----------------|--------|-----------|-----------|-----|
| Inflow   | =    | = | 1.1 cfs @  | 12.14 hrs, Volu | ume=   | 3,456          | cf     |           |           |     |
| Primary  | y =  | = | 1.1 cfs @  | 12.14 hrs, Volu | ume=   | 3,456          | cf, At | ten= 0%,  | Lag= 0.0  | min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### **Summary for Link AP3:**

| Inflow A | rea = | 196,746 sf, | 5.32% Impervious,  | Inflow Depth > 0. | 58" for 2-Year event    |
|----------|-------|-------------|--------------------|-------------------|-------------------------|
| Inflow   | =     | 2.7 cfs @   | 12.25 hrs, Volume= | 9,469 cf          |                         |
| Primary  | =     | 2.7 cfs @   | 12.25 hrs, Volume= | 9,469 cf,         | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### **Summary for Link AP4:**

| Inflow Are | a = | 14,618 sf, | 41.41% Impervious, | Inflow Depth > 1 | l.45" fe | or 2-Year event    |
|------------|-----|------------|--------------------|------------------|----------|--------------------|
| Inflow     | =   | 0.4 cfs @  | 12.17 hrs, Volume= | 1,768 cf         |          |                    |
| Primary    | =   | 0.4 cfs @  | 12.17 hrs, Volume= | 1,768 cf         | , Atten= | = 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 10-Year Rainfall=4.77"             |
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Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.1:  | Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>2.34"<br>Flow Length=549' Tc=7.5 min CN=76 Runoff=3.1 cfs 10,638 cf            |
|---------------------|---|
| Subcatchment SC1.2: | Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>2.18"<br>Flow Length=510' Tc=6.7 min CN=74 Runoff=6.3 cfs 20,959 cf            |
| SubcatchmentSC1.3:  | Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>4.41"<br>Tc=5.0 min CN=97 Runoff=0.6 cfs 2,074 cf                               |
| SubcatchmentSC1.4:  | Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>4.53"<br>Tc=5.0 min CN=98 Runoff=0.2 cfs 833 cf                                |
| SubcatchmentSC1.5:  | Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>1.94"<br>Flow Length=337' Tc=6.4 min CN=71 Runoff=2.2 cfs 7,474 cf              |
| SubcatchmentSC1.6:  | Runoff Area=622 sf 100.00% Impervious Runoff Depth>4.53"<br>Tc=5.0 min CN=98 Runoff=0.1 cfs 235 cf                                  |
| SubcatchmentSC2.1:  | Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>3.15"<br>Flow Length=68' Tc=5.0 min CN=85 Runoff=0.3 cfs 979 cf                 |
| Subcatchment SC2.2: | Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>2.18"<br>Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=2.1 cfs 6,975 cf |
| SubcatchmentSC3.1:  | Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>2.09"<br>Flow Length=564' Tc=10.4 min CN=73 Runoff=3.0 cfs 11,668 cf            |
| SubcatchmentSC3.2:  | Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>1.94"<br>Flow Length=378' Tc=10.1 min CN=71 Runoff=2.3 cfs 8,887 cf             |
| Subcatchment SC3.3: | Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>1.94"<br>Flow Length=287' Tc=10.8 min CN=71 Runoff=2.6 cfs 10,078 cf            |
| SubcatchmentSC3.4:  | Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>3.25"<br>Flow Length=246' Tc=5.0 min CN=86 Runoff=1.0 cfs 3,342 cf             |
| Subcatchment SC4.1: | Runoff Area=4,504 sf   4.43% Impervious   Runoff Depth>2.18"<br>Flow Length=64'   Tc=5.0 min   CN=74   Runoff=0.3 cfs  818 cf       |
| SubcatchmentSC4.2:  | Runoff Area=10,114 sf  57.88% Impervious  Runoff Depth>3.24"<br>Flow Length=75'  Tc=12.7 min  CN=86  Runoff=0.6 cfs  2,732 cf       |
| Pond CB1:           | Peak Elev=298.26' Inflow=0.2 cfs 833 cf<br>12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.2 cfs 833 cf                 |
| Pond CB2:           | Peak Elev=288.64' Inflow=0.6 cfs 2,074 cf<br>12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.6 cfs 2,074 cf               |

| Post-Dev Rev 2<br>Prepared by Goldsmith, P | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA<br>NRCC 24-hr D 10-Year Rainfall=4.77"<br>Printed 7/14/2020                                    |
|--|--|
| HydroCAD® 10.10-4a s/n 010                 | 36 © 2020 HydroCAD Software Solutions LLC Page 61  |
| Pond DCB3:                                 | Peak Elev=288.80' Storage=2 cf Inflow=6.3 cfs 20,959 cf<br>24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=6.3 cfs 20,958 cf          |
| Pond DCB4:                                 | Peak Elev=288.39' Storage=1 cf Inflow=3.1 cfs 10,638 cf<br>15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=3.1 cfs 10,637 cf          |
| Pond DCB5:                                 | Peak Elev=299.21' Inflow=3.0 cfs 11,668 cf<br>21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=3.0 cfs 11,668 cf                       |
| Pond DCB6:                                 | Peak Elev=299.14' Inflow=1.0 cfs 3,342 cf<br>21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=1.0 cfs 3,342 cf                          |
| Pond DCB7:                                 | Peak Elev=299.21' Inflow=2.3 cfs 8,887 cf<br>18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=2.3 cfs 8,887 cf                          |
| Pond DMH1:                                 | Peak Elev=288.35' Inflow=7.0 cfs 23,866 cf<br>24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=7.0 cfs 23,866 cf                       |
| Pond DMH2:                                 | Peak Elev=299.15' Inflow=3.8 cfs 15,011 cf<br>30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=3.8 cfs 15,011 cf                        |
| Pond IC-1:                                 | Peak Elev=286.50' Storage=5,991 cf Inflow=10.1 cfs 34,503 cf<br>Discarded=0.1 cfs 7,270 cf Primary=8.0 cfs 22,704 cf Outflow=8.2 cfs 29,975 cf |
| Pond IC-2:                                 | Peak Elev=299.12' Storage=3,055 cf Inflow=6.0 cfs 23,897 cf<br>Discarded=0.1 cfs 4,567 cf Primary=4.9 cfs 17,357 cf Outflow=5.0 cfs 21,924 cf  |
| Pond SD-1:                                 | Peak Elev=300.92' Storage=40 cf Inflow=0.3 cfs 979 cf<br>Discarded=0.0 cfs 364 cf Primary=0.3 cfs 579 cf Outflow=0.3 cfs 943 cf                |
| Pond SD-2:                                 | Peak Elev=303.43' Storage=15 cf Inflow=0.3 cfs 818 cf<br>Discarded=0.0 cfs 123 cf Primary=0.3 cfs 681 cf Outflow=0.3 cfs 803 cf                |
| Link AP1:                                  | Inflow=10.0 cfs 30,413 cf<br>Primary=10.0 cfs 30,413 cf  |
| Link AP2:                                  | Inflow=2.4 cfs 7,554 cf<br>Primary=2.4 cfs 7,554 cf  |
| Link AP3:                                  | Inflow=7.3 cfs 27,435 cf<br>Primary=7.3 cfs 27,435 cf  |
| Link AP4:                                  | Inflow=0.8 cfs 3,412 cf<br>Primary=0.8 cfs 3,412 cf  |

Total Runoff Area = 478,286 sf Runoff Volume = 87,692 cf Average Runoff Depth = 2.20" 88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

#### Summary for Subcatchment SC1.1:

Runoff = 3.1 cfs @ 12.15 hrs, Volume= 10,638 cf, Depth> 2.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| A     | rea (sf) | CN      | Description                      |              |                                    |  |  |  |
|-------|----------|---------|----------------------------------|--------------|------------------------------------|--|--|--|
|       | 24,785   | 74      | 74 >75% Grass cover, Good, HSG C |              |                                    |  |  |  |
|       | 21,721   | 70      | Woods, Go                        | od, HSG C    |                                    |  |  |  |
|       | 14       | 89      | Gravel road                      | ls, HSG C    |                                    |  |  |  |
|       | 6,226    | 98      | Paved park                       | ing, HSG C   |                                    |  |  |  |
|       | 1,776    | 98      | Roofs, HSC                       | G C          |                                    |  |  |  |
|       | 54,522   | 76      | Weighted A                       | verage       |                                    |  |  |  |
|       | 46,520   |         | 85.32% Pei                       | vious Area   |                                    |  |  |  |
|       | 8,002    |         | 14.68% Imp                       | pervious Are | ea                                 |  |  |  |
|       |          |         |                                  |              |                                    |  |  |  |
| Tc    | Length   | Slope   | Velocity                         | Capacity     | Description                        |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                    |  |  |  |
| 0.9   | 50       | 0.0100  | 0.90                             |              | Sheet Flow,                        |  |  |  |
|       |          |         |                                  |              | Smooth surfaces n= 0.011 P2= 3.16" |  |  |  |
| 0.2   | 35       | 0.0200  | 2.87                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Paved Kv= 20.3 fps                 |  |  |  |
| 0.6   | 50       | 0.0345  | 1.30                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |
| 1.5   | 180      | 0.1550  | 1.97                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps               |  |  |  |
| 4.3   | 234      | 0.0170  | 0.91                             |              | Shallow Concentrated Flow,         |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |
| 7.5   | 549      | Total   |                                  |              |                                    |  |  |  |

# **Summary for Subcatchment SC1.2:**

| Runoff = 6.3 cfs @ 12.14 hrs, Volume= 20,959 cf, Depth> |
|---|
|---|

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 46,703    | 74 | >75% Grass cover, Good, HSG C |
| 57,729    | 70 | Woods, Good, HSG C            |
| 967       | 89 | Gravel roads, HSG C           |
| 313       | 98 | Unconnected pavement, HSG C   |
| 7,362     | 98 | Paved parking, HSG C          |
| 2,449     | 98 | Roofs, HSG C                  |
| 115,523   | 74 | Weighted Average              |
| 105,398   |    | 91.24% Pervious Area          |
| 10,124    |    | 8.76% Impervious Area         |
| 313       |    | 3.09% Unconnected             |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                     |
|-------------|------------------|------------------|----------------------|-------------------|---------------------------------|
| 3.6         | 50               | 0.0600           | 0.23                 |                   | Sheet Flow,                     |
|             |                  |                  |                      |                   | Grass: Short n= 0.150 P2= 3.16" |
| 1.3         | 167              | 0.0988           | 2.20                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 0.8         | 117              | 0.1200           | 2.42                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 1.0         | 176              | 0.0400           | 3.00                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Grassed Waterway Kv= 15.0 fps   |
| 6.7         | 510              | Total            |                      |                   |                                 |

# Summary for Subcatchment SC1.3:

| Runoff | = | 0.6 cfs @ | 12.12 hrs, | Volume= | 2,074 cf, Depth> 4 | 1.41" |
|--------|---|-----------|------------|---------|--------------------|-------|

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| A           | rea (sf)         | CN            | Description               |                   |               |  |
|-------------|------------------|---------------|---------------------------|-------------------|---------------|--|
|             | 162              | 74            | >75% Gras                 | s cover, Go       | bod, HSG C    |  |
|             | 243              | 89            | Gravel roads, HSG C       |                   |               |  |
|             | 5,233            | 98            | Paved park                | ing, HSG C        |               |  |
|             | 5,639            | 97            | Weighted A                | verage            |               |  |
|             | 405              |               | 7.19% Perv                | vious Area        |               |  |
|             | 5,233            |               | 92.81% Imp                | pervious Ar       | ea            |  |
| Tc<br>(min) | Length<br>(feet) | Slop<br>(ft/f | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs) | Description   |  |
| 5.0         |                  |               |                           |                   | Direct Entry, |  |
|             |                  |               |                           |                   |               |  |

# Summary for Subcatchment SC1.4:

Runoff = 0.2 cfs @ 12.12 hrs, Volume= 833 cf, Depth> 4.53"

| Α           | rea (sf)         | CN               | Description          |                   |               |  |
|-------------|------------------|------------------|----------------------|-------------------|---------------|--|
|             | 2,208            | 98               | Paved park           | ing, HSG C        |               |  |
|             | 2,208            |                  | 100.00% In           | npervious A       | rea           |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |  |
| 5.0         |                  |                  |                      |                   | Direct Entry, |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 10-Year Rainfall=4.77"             |
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#### Summary for Subcatchment SC1.5:

Runoff 2.2 cfs @ 12.14 hrs, Volume= 7,474 cf, Depth> 1.94" =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| Area             | (sf)          | CN [             | Description          |                   |   |
|------------------|---------------|------------------|----------------------|-------------------|---|
| 37,              | 139           | 70 \             | Voods, Go            | od, HSG C         |   |
|                  | 441           | 98 l             | Jnconnecte           | ed pavemer        | nt, HSG C   |
| 8,               | 658           | 74 >             | >75% Gras            | s cover, Go       | bod, HSG C  |
| 46,2             | 238           | 71 \             | Veighted A           | verage            |   |
| 45,              | 797           | ç                | 99.05% Per           | vious Area        |   |
|                  | 441           | (                | ).95% Impe           | ervious Area      | a   |
| •                | 441           | -                | 100.00% Ui           | nconnected        | 1   |
| Tc Le<br>(min) ( | ngth<br>feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
| 3.3              | 50            | 0.0800           | 0.26                 |                   | Sheet Flow,   |
| 3.1              | 287           | 0.0941           | 1.53                 |                   | Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Woodland Kv= 5.0 fps |
| 6.4              | 337           | Total            |                      |                   |   |

337 Total

#### Summary for Subcatchment SC1.6:

235 cf, Depth> 4.53" Runoff 0.1 cfs @ 12.12 hrs, Volume= =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| Area (sf)                 | CN            | Description               |                   |               |  |  |
|---------------------------|---------------|---------------------------|-------------------|---------------|--|--|
| 622                       | 98            | 3 Paved parking, HSG C    |                   |               |  |  |
| 622                       |               | 100.00% In                | npervious A       | Area          |  |  |
| Tc Length<br>(min) (feet) | Slop<br>(ft/f | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs) | Description   |  |  |
| 5.0                       |               |                           |                   | Direct Entry, |  |  |

# Summary for Subcatchment SC2.1:

Runoff 0.3 cfs @ 12.12 hrs, Volume= 979 cf, Depth> 3.15" =

HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLC Page 65 Description Area (sf) CN 1,953 >75% Grass cover, Good, HSG C 74 1,776 98 Roofs, HSG C 3,729 Weighted Average 85 1,953 52.37% Pervious Area 1,776 47.63% Impervious Area Capacity Tc Length Slope Velocity Description (ft/ft) (min) (feet) (ft/sec) (cfs) 0.0400 4.3 50 0.19 Sheet Flow, Grass: Short n= 0.150 P2= 3.16" 0.2 18 0.0300 1.21 Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps 4.5 68 Total, Increased to minimum Tc = 5.0 min Summary for Subcatchment SC2.2:

Runoff 2.1 cfs @ 12.14 hrs, Volume= 6,975 cf, Depth> 2.18" =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| _ | A                 | rea (sf)                         | CN A                                  | Adj Desc                         | ription     |   |
|---|-------------------|----------------------------------|---------------------------------------|----------------------------------|-------------|---|
|   |                   | 7,180                            | 74                                    | >75%                             | 6 Grass co  | ver, Good, HSG C  |
|   |                   | 22,269                           | 70                                    | Woo                              | ds, Good, H | HSG C   |
| _ |                   | 8,992                            | 98                                    | Unco                             | onnected pa | avement, HSG C  |
|   |                   | 38,441                           | 77                                    | 74 Weig                          | hted Avera  | age, UI Adjusted  |
|   |                   | 29,449                           |                                       | 76.6                             | 1% Perviou  | is Area   |
|   |                   | 8,992                            |                                       | 23.3                             | 9% Impervi  | ous Area  |
|   |                   | 8,992                            |                                       | 100.0                            | 00% Uncor   | nected  |
|   |                   |                                  |                                       |                                  |             |   |
|   | Тс                | Length                           | Slope                                 | Velocity                         | Capacity    | Description   |
|   | (min)             | (f 1)                            | 101101                                | (6)                              | (           |   |
|   | (11111)           | (teet)                           | (ft/ft)                               | (II/sec)                         | (CTS)       |   |
|   | 5.7               | (teet)<br>50                     | (ft/ft)<br>0.0200                     | <u>(π/sec)</u><br>0.15           | (CTS)       | Sheet Flow,   |
|   | 5.7               | (feet)<br>50                     | (ft/ft)<br>0.0200                     | <u>(π/sec)</u><br>0.15           | (CTS)       | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"  |
|   | 5.7<br>0.2        | (feet)<br>50<br>29               | (ft/ft)<br>0.0200<br>0.1700           | 0.15<br>2.89                     | (CTS)       | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,  |
|   | 5.7<br>0.2        | 50<br>29                         | (ft/ft)<br>0.0200<br>0.1700           | (π/sec)<br>0.15<br>2.89          | (CTS)       | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Short Grass Pasture Kv= 7.0 fps   |
|   | 5.7<br>0.2<br>0.5 | (feet)<br>50<br>29<br>61         | (ft/ft)<br>0.0200<br>0.1700<br>0.1800 | (π/sec)<br>0.15<br>2.89<br>2.12  | (CTS)       | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Short Grass Pasture Kv= 7.0 fps<br>Shallow Concentrated Flow,                         |
|   | 5.7<br>0.2<br>0.5 | ( <u>feet)</u><br>50<br>29<br>61 | (ft/ft)<br>0.0200<br>0.1700<br>0.1800 | (ft/sec)<br>0.15<br>2.89<br>2.12 | (CIS)       | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Short Grass Pasture Kv= 7.0 fps<br>Shallow Concentrated Flow,<br>Woodland Kv= 5.0 fps |

6.4 140 l otal

#### Summary for Subcatchment SC3.1:

Runoff 3.0 cfs @ 12.18 hrs, Volume= 11,668 cf, Depth> 2.09" =

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| A     | rea (sf) | CN I    | Description                      |                      |                                 |  |  |  |  |
|-------|----------|---------|----------------------------------|----------------------|---------------------------------|--|--|--|--|
|       | 32,168   | 74 >    | 74 >75% Grass cover, Good, HSG C |                      |                                 |  |  |  |  |
|       | 31,971   | 70      | Noods, Go                        | od, HSG C            |                                 |  |  |  |  |
|       | 364      | 89 (    | Gravel road                      | ls, HSG C            |                                 |  |  |  |  |
|       | 55       | 98 I    | Paved park                       | ing, HSG C           |                                 |  |  |  |  |
|       | 2,321    | 98      | Roofs, HSC                       | G C                  |                                 |  |  |  |  |
|       | 66,880   | 73      | Neighted A                       | verage               |                                 |  |  |  |  |
|       | 64,504   | ę       | 96.45% Pei                       | vious Area           |                                 |  |  |  |  |
|       | 2,376    |         | 3.55% Impe                       | ervious Area         | а                               |  |  |  |  |
| _     |          |         |                                  |                      |                                 |  |  |  |  |
| TC    | Length   | Slope   | Velocity                         | Capacity             | Description                     |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)                |                                 |  |  |  |  |
| 5.7   | 50       | 0.0200  | 0.15                             |                      | Sheet Flow,                     |  |  |  |  |
|       |          |         |                                  |                      | Grass: Short n= 0.150 P2= 3.16" |  |  |  |  |
| 2.1   | 247      | 0.0800  | 1.98                             |                      | Shallow Concentrated Flow,      |  |  |  |  |
|       |          |         |                                  |                      | Short Grass Pasture Kv= 7.0 fps |  |  |  |  |
| 1.5   | 133      | 0.0830  | 1.44                             |                      | Shallow Concentrated Flow,      |  |  |  |  |
|       |          |         |                                  | Woodland Kv= 5.0 fps |                                 |  |  |  |  |
| 1.1   | 134      | 0.0820  | 2.00                             |                      | Shallow Concentrated Flow,      |  |  |  |  |
|       |          |         |                                  |                      | Short Grass Pasture Kv= 7.0 fps |  |  |  |  |

10.4 564 Total

# **Summary for Subcatchment SC3.2:**

Runoff = 2.3 cfs @ 12.18 hrs, Volume= 8

8,887 cf, Depth> 1.94"

| A     | rea (sf) | CN      | Description                      |              |  |  |  |  |  |  |
|-------|----------|---------|----------------------------------|--------------|--|--|--|--|--|--|
|       | 12,832   | 74 :    | 74 >75% Grass cover, Good, HSG C |              |  |  |  |  |  |  |
|       | 880      | 98      | Roofs, HSG                       | G C          |  |  |  |  |  |  |
|       | 41,349   | 70      | Woods, Go                        | od, HSG C    |  |  |  |  |  |  |
|       | 55,060   | 71      | Weighted A                       | verage       |  |  |  |  |  |  |
|       | 54,180   | 9       | 98.40% Pei                       | vious Area   |  |  |  |  |  |  |
|       | 880      |         | 1.60% Impe                       | ervious Area | а  |  |  |  |  |  |
|       |          |         |                                  |              |  |  |  |  |  |  |
| Тс    | Length   | Slope   | Velocity                         | Capacity     | Description                                |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |  |  |  |  |  |  |
| 7.1   | 50       | 0.0800  | 0.12                             |              | Sheet Flow,                                |  |  |  |  |  |
|       |          |         |                                  |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |  |  |
| 1.7   | 204      | 0.1600  | 2.00                             |              | Shallow Concentrated Flow,                 |  |  |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps                       |  |  |  |  |  |
| 1.3   | 124      | 0.0530  | 1.61                             |              | Shallow Concentrated Flow,                 |  |  |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps            |  |  |  |  |  |
| 10.1  | 378      | Total   |                                  |              |  |  |  |  |  |  |

#### Summary for Subcatchment SC3.3:

Runoff = 2.6 cfs @ 12.19 hrs, Volume= 10,078 cf, Depth> 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| A           | rea (sf)         | CN [             | Description          |                   |   |
|-------------|------------------|------------------|----------------------|-------------------|---|
|             | 12,393           | 74 >             | >75% Gras            | s cover, Go       | ood, HSG C  |
|             | 49,047           | 70 \             | Voods, Go            | od, HSG C         |   |
|             | 1,019            | 98 l             | Jnconnecte           | ed pavemer        | nt, HSG C   |
|             | 62,459           | 71 \             | Veighted A           | verage            |   |
|             | 61,440           | ę                | 98.37% Pei           | vious Area        |   |
|             | 1,019            |                  | l.63% Impe           | ervious Area      | а   |
|             | 1,019            |                  | 100.00% Ui           | nconnected        | 1   |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
| 8.6         | 50               | 0.0500           | 0.10                 |                   | Sheet Flow,   |
| 2.2         | 237              | 0.1350           | 1.84                 |                   | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |
| 10.8        | 287              | Total            |                      |                   |   |

### **Summary for Subcatchment SC3.4:**

Runoff = 1.0 cfs @ 12.12 hrs, Volume= 3,342 cf, Depth> 3.25"

| A     | rea (sf) | CN E     | Description |              |                                    |
|-------|----------|----------|-------------|--------------|------------------------------------|
|       | 5,554    | 74 >     | 75% Gras    | s cover, Go  | ood, HSG C                         |
|       | 529      | 70 V     | Voods, Go   | od, HSG C    |                                    |
|       | 76       | 89 C     | Gravel road | ls, HSG C    |                                    |
|       | 6,187    | 98 F     | Paved park  | ing, HSG C   |                                    |
|       | 12,347   | 86 V     | Veighted A  | verage       |                                    |
|       | 6,159    | 4        | 9.89% Per   | vious Area   |                                    |
|       | 6,187    | 5        | i0.11% Imp  | pervious Are | ea                                 |
|       |          |          |             |              |                                    |
| Tc    | Length   | Slope    | Velocity    | Capacity     | Description                        |
| (min) | (feet)   | (ft/ft)  | (ft/sec)    | (cfs)        |                                    |
| 1.3   | 113      | 0.0200   | 1.40        |              | Sheet Flow,                        |
|       |          |          |             |              | Smooth surfaces n= 0.011 P2= 3.16" |
| 2.4   | 38       | 0.1000   | 0.27        |              | Sheet Flow,                        |
|       |          |          |             |              | Grass: Short n= 0.150 P2= 3.16"    |
| 0.9   | 95       | 0.0600   | 1.71        |              | Shallow Concentrated Flow,         |
|       |          |          |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 4.6   | 246      | Total, I | ncreased t  | o minimum    | Tc = 5.0 min                       |

#### Summary for Subcatchment SC4.1:

Runoff = 0.3 cfs @ 12.12 hrs, Volume= 818 cf, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 10-Year Rainfall=4.77"

| A     | rea (sf) | CN     | Description |             |                                 |
|-------|----------|--------|-------------|-------------|---------------------------------|
|       | 1,020    | 70     | Woods, Go   | od, HSG C   |                                 |
|       | 200      | 98     | Unconnecte  | ed pavemer  | nt, HSG C                       |
|       | 3,285    | 74     | >75% Gras   | s cover, Go | bod, HSG C                      |
|       | 4,504    | 74     | Weighted A  | verage      |                                 |
|       | 4,305    |        | 95.57% Pei  | vious Area  |                                 |
|       | 200      |        | 4.43% Impe  | ervious Are | а                               |
|       | 200      |        | 100.00% U   | nconnected  | 1                               |
|       |          |        |             |             |                                 |
| Тс    | Length   | Slope  | e Velocity  | Capacity    | Description                     |
| (min) | (feet)   | (ft/ft | ) (ft/sec)  | (cfs)       |                                 |
| 3.6   | 50       | 0.0600 | 0.23        |             | Sheet Flow,                     |
|       |          |        |             |             | Grass: Short n= 0.150 P2= 3.16" |
| 0.2   | 14       | 0.0400 | ) 1.40      |             | Shallow Concentrated Flow,      |
|       |          |        |             |             | Short Grass Pasture Kv= 7.0 fps |
| 3.8   | 64       | Total, | Increased t | o minimum   | 1 Tc = 5.0 min                  |

# **Summary for Subcatchment SC4.2:**

Runoff = 0.6 cfs @ 12.20 hrs, Volume= 2,732 cf, Depth> 3.24"

| A     | rea (sf) | CN [    | Description         |              |  |
|-------|----------|---------|---------------------|--------------|--|
|       | 3,927    | 70 \    | Voods, Go           | od, HSG C    |  |
|       | 5,854    | 98 l    | Jnconnecte          | ed pavemer   | nt, HSG C                                  |
|       | 333      | 74 >    | <u>&gt;75% Gras</u> | s cover, Go  | ood, HSG C                                 |
|       | 10,114   | 86 \    | Veighted A          | verage       |  |
|       | 4,260    | 2       | 2.12% Pe            | vious Area   |  |
|       | 5,854    | Ę       | 57.88% Imp          | pervious Are | ea   |
|       | 5,854    |         | 100.00% Ui          | nconnected   | 1  |
| _     |          |         |                     | _            |  |
| Tc    | Length   | Slope   | Velocity            | Capacity     | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec)            | (cfs)        |  |
| 12.4  | 50       | 0.0200  | 0.07                |              | Sheet Flow,                                |
|       |          |         |                     |              | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 0.3   | 25       | 0.0800  | 1.41                |              | Shallow Concentrated Flow,                 |
|       |          |         |                     |              | Woodland Kv= 5.0 fps                       |
| 12.7  | 75       | Total   |                     |              |  |
|       |          |         |                     |              |  |

# Summary for Pond CB1:

| Inflow Are | ea = | 2,208 sf,100.00% Impervious, | Inflow Depth > 4.53" for 10-Year event |
|------------|------|------------------------------|--|
| Inflow     | =    | 0.2 cfs @ 12.12 hrs, Volume= | 833 cf                                 |
| Outflow    | =    | 0.2 cfs @ 12.12 hrs, Volume= | 833 cf, Atten= 0%, Lag= 0.0 min        |
| Primary    | =    | 0.2 cfs @ 12.12 hrs, Volume= | 833 cf                                 |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.26' @ 12.12 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 298.00' | <b>12.0" Round Culvert</b><br>L= 220.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.2 cfs @ 12.12 hrs HW=298.26' TW=288.31' (Dynamic Tailwater) -1=Culvert (Inlet Controls 0.2 cfs @ 1.38 fps)

#### Summary for Pond CB2:

| Inflow Area | a = | 5,639 sf, | 92.81% Impervious, | Inflow Depth > 4.41" | for 10-Year event    |
|-------------|-----|-----------|--------------------|----------------------|----------------------|
| Inflow      | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,074 cf             |                      |
| Outflow     | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,074 cf, Atte       | en= 0%, Lag= 0.0 min |
| Primary     | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,074 cf             | -                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.64' @ 12.12 hrs Flood Elev= 292.30'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 288.20' | <b>12.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.6 cfs @ 12.12 hrs HW=288.64' TW=288.31' (Dynamic Tailwater) ←1=Culvert (Barrel Controls 0.6 cfs @ 2.52 fps)

#### Summary for Pond DCB3:

| Inflow Area | ı = | 115,523 sf, | 8.76% Impervious,  | Inflow Depth > 2 | 2.18" for 10-`  | Year event   |
|-------------|-----|-------------|--------------------|------------------|-----------------|--------------|
| Inflow      | =   | 6.3 cfs @   | 12.14 hrs, Volume= | 20,959 cf        | f               |              |
| Outflow     | =   | 6.3 cfs @   | 12.14 hrs, Volume= | 20,958 cf        | f, Atten= 0%, I | Lag= 0.0 min |
| Primary     | =   | 6.3 cfs @   | 12.14 hrs, Volume= | 20,958 cf        | f               |              |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 288.80' @ 12.14 hrs Surf.Area= 1 sf Storage= 2 cf Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 0.0 min calculated for 20,958 cf (100% of inflow) Center-of-Mass det. time= 0.0 min (866.0 - 866.0)

| Volume           | Inv     | ert Avai             | I.Storage                                 | Storage Description   | on                          |                             |  |  |
|------------------|---------|----------------------|---|---|-----------------------------|-----------------------------|--|--|
| #1               | 287.0   | 00'                  | 310 cf                                    | Custom Stage D  | <b>ata (Irregular)</b> List | ed below (Recalc)           |  |  |
| Elevatio<br>(fee | n<br>t) | Surf.Area<br>(sq-ft) | Perim.<br>(feet)                          | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft <u>)</u> |  |  |
| 287.0            | 0       | 1                    | 1.0                                       | 0   | 0                           | 1                           |  |  |
| 288.0            | 0       | 1                    | 1.0                                       | 1   | 1                           | 2                           |  |  |
| 289.0            | 0       | 1                    | 1.0                                       | 1   | 2                           | 3                           |  |  |
| 290.0            | 0       | 1                    | 1.0                                       | 1   | 3                           | 4                           |  |  |
| 291.0            | 0       | 89                   | 87.5                                      | 33  | 36                          | 615                         |  |  |
| 292.0            | 0       | 519                  | 180.8                                     | 274   | 310                         | 2,611                       |  |  |
| Device           | Routing | In                   | vert Outle                                | et Devices  |                             |                             |  |  |
| #1               | Primary | 287                  | .34' <b>24.0</b><br>L= 1<br>Inlet<br>n= 0 | <b>24.0" Round Culvert</b><br>L= 12.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.34' / 287.10' S= 0.0200 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |                             |                             |  |  |

Primary OutFlow Max=6.3 cfs @ 12.14 hrs HW=288.80' TW=288.35' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 6.3 cfs @ 2.55 fps)

#### Summary for Pond DCB4:

| Inflow Area | a = | 54,522 sf, | 14.68% Impervious, | Inflow Depth > 2 | 2.34" for 10-Year event   |
|-------------|-----|------------|--------------------|------------------|---------------------------|
| Inflow      | =   | 3.1 cfs @  | 12.15 hrs, Volume= | 10,638 cf        |                           |
| Outflow     | =   | 3.1 cfs @  | 12.15 hrs, Volume= | 10,637 cf        | , Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 3.1 cfs @  | 12.15 hrs, Volume= | 10,637 cf        | -                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.39' @ 12.15 hrs Surf.Area= 1 sf Storage= 1 cf Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 0.0 min calculated for 10,629 cf (100% of inflow) Center-of-Mass det. time= 0.0 min (860.0 - 859.9)

| Volume              | Invert    | Avail           | .Storage         | Storage Description       |                             |                             |
|---------------------|-----------|-----------------|------------------|---------------------------|-----------------------------|-----------------------------|
| #1                  | 287.00'   |                 | 250 cf           | Custom Stage Data         | <b>a (Irregular)</b> Listec | l below (Recalc)            |
| Elevation<br>(feet) | Surf<br>( | .Area<br>sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft <u>)</u> |
| 287.00              |           | 1               | 1.0              | 0                         | 0                           | 1                           |
| 288.00              |           | 1               | 1.0              | 1                         | 1                           | 2                           |
| 289.00              |           | 1               | 1.0              | 1                         | 2                           | 3                           |
| 290.00              |           | 1               | 1.0              | 1                         | 3                           | 4                           |
| 291.00              |           | 714             | 132.0            | 247                       | 250                         | 1,392                       |

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.25' | <b>15.0" Round Culvert</b><br>L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=3.1 cfs @ 12.15 hrs HW=288.39' TW=286.37' (Dynamic Tailwater) **1=Culvert** (Barrel Controls 3.1 cfs @ 3.44 fps)

#### Summary for Pond DCB5:

| Inflow Area | a = | 66,880 sf, | 3.55% Impervious,  | Inflow Depth > 2. | 09" for 10-Year event   |
|-------------|-----|------------|--------------------|-------------------|-------------------------|
| Inflow      | =   | 3.0 cfs @  | 12.18 hrs, Volume= | 11,668 cf         |                         |
| Outflow     | =   | 3.0 cfs @  | 12.18 hrs, Volume= | 11,668 cf,        | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 3.0 cfs @  | 12.18 hrs, Volume= | 11,668 cf         | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 299.21' @ 12.24 hrs Flood Elev= 302.50'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.42' | 21.0" Round Culvert  |
|        |         |         | L= 47.0° CPP, projecting, no neadwall, Ke= 0.900                 |
|        |         |         | Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf      |

Primary OutFlow Max=0.9 cfs @ 12.18 hrs HW=299.04' TW=299.03' (Dynamic Tailwater) -1=Culvert (Inlet Controls 0.9 cfs @ 0.38 fps)

#### Summary for Pond DCB6:

| Inflow Are | ea = | 12,347 sf, | 50.11% Impervious, | Inflow Depth > 3.25" | for 10-Year event    |
|------------|------|------------|--------------------|----------------------|----------------------|
| Inflow     | =    | 1.0 cfs @  | 12.12 hrs, Volume= | 3,342 cf             |                      |
| Outflow    | =    | 1.0 cfs @  | 12.12 hrs, Volume= | 3,342 cf, Atte       | en= 0%, Lag= 0.0 min |
| Primary    | =    | 1.0 cfs @  | 12.12 hrs, Volume= | 3,342 cf             | U U                  |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 299.14' @ 12.25 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>21.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=298.58' TW=298.67' (Dynamic Tailwater) -1=Culvert (Controls 0.0 cfs)

# Summary for Pond DCB7:

| Inflow Are | a = | 55,060 sf, | 1.60% Impervious,  | Inflow Depth > 1.94" for 10-Y | 'ear event  |
|------------|-----|------------|--------------------|-------------------------------|-------------|
| Inflow     | =   | 2.3 cfs @  | 12.18 hrs, Volume= | 8,887 cf                      |             |
| Outflow    | =   | 2.3 cfs @  | 12.18 hrs, Volume= | 8,887 cf, Atten= 0%, L        | ag= 0.0 min |
| Primary    | =   | 2.3 cfs @  | 12.18 hrs, Volume= | 8,887 cf                      | -           |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 299.21' @ 12.23 hrs Flood Elev= 302.70'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>18.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |

Primary OutFlow Max=2.3 cfs @ 12.18 hrs HW=299.09' TW=298.97' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 2.3 cfs @ 1.30 fps)

#### Summary for Pond DMH1:

| Inflow Are | a = | 123,370 sf, | 14.24% Impervious, | Inflow Depth > | 2.32" fc  | or 10-Year event |
|------------|-----|-------------|--------------------|----------------|-----------|------------------|
| Inflow     | =   | 7.0 cfs @   | 12.14 hrs, Volume= | 23,866 c       | f         |                  |
| Outflow    | =   | 7.0 cfs @   | 12.14 hrs, Volume= | 23,866 c       | f, Atten= | 0%, Lag= 0.0 min |
| Primary    | =   | 7.0 cfs @   | 12.14 hrs, Volume= | 23,866 c       | f         | -                |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.35' @ 12.14 hrs Flood Elev= 292.00'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.00' | <b>24.0" Round Culvert</b><br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

Primary OutFlow Max=7.0 cfs @ 12.14 hrs HW=288.34' TW=286.31' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 7.0 cfs @ 3.12 fps)

#### Summary for Pond DMH2:

| Inflow Area | a = | 79,226 sf, | 10.81% Impervious, | Inflow Depth > | 2.27" f   | or 10-Year event   |
|-------------|-----|------------|--------------------|----------------|-----------|--------------------|
| Inflow      | =   | 3.8 cfs @  | 12.16 hrs, Volume= | 15,011 c       | f         |                    |
| Outflow     | =   | 3.8 cfs @  | 12.16 hrs, Volume= | 15,011 c       | f, Atten= | = 0%, Lag= 0.0 min |
| Primary     | =   | 3.8 cfs @  | 12.16 hrs, Volume= | 15,011 c       | f         |                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

\_

Peak Elev= 299.15' @ 12.23 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 296.85' | <b>30.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf |

Primary OutFlow Max=3.8 cfs @ 12.16 hrs HW=298.89' TW=298.84' (Dynamic Tailwater) ☐ 1=Culvert (Inlet Controls 3.8 cfs @ 0.87 fps)

#### Summary for Pond IC-1:

| Inflow Area | a = | 177,892 sf, | 14.37% Impervious, | Inflow Depth > 2. | 33" for 10-Year event    |
|-------------|-----|-------------|--------------------|-------------------|--------------------------|
| Inflow      | =   | 10.1 cfs @  | 12.14 hrs, Volume= | 34,503 cf         |                          |
| Outflow     | =   | 8.2 cfs @   | 12.19 hrs, Volume= | 29,975 cf,        | Atten= 19%, Lag= 2.9 min |
| Discarded   | =   | 0.1 cfs @   | 10.72 hrs, Volume= | 7,270 cf          | -                        |
| Primary     | =   | 8.0 cfs @   | 12.19 hrs, Volume= | 22,704 cf         |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 286.50' @ 12.19 hrs Surf.Area= 2,271 sf Storage= 5,991 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 26.2 min (881.1 - 854.9)

| Volume | Invert  | Avail.Storage | Storage Description   |
|--------|---------|---------------|---|
| #1     | 282.40' | 3,658 cf      | IC-1 Stone bed (Irregular)Listed below (Recalc)                 |
|        |         |               | 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids  |
| #2     | 283.40' | 5,002 cf      | ADS_StormTech MC-4500 b +Cap x 44 Inside #1                     |
|        |         |               | Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf |
|        |         |               | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap      |
|        |         |               | 44 Chambers in 4 Rows   |
|        |         |               | Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf                   |
| #3     | 283.00' | 200 cf        | PES-1 Stone bed (Pyramidal)Listed below (Recalc)                |
|        |         |               | 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids         |
| #4     | 283.00' | 126 cf        | 24.0" Round Pipe Storage Inside #3                              |
|        |         |               | L= 40.0'  |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|------------------|---------------------------|---------------------------|-----------------------------|
| 282.40              | 2,021                | 188.0            | 0                         | 0                         | 2,021                       |
| 283.00              | 2,021                | 188.0            | 1,213                     | 1,213                     | 2,134                       |
| 284.00              | 2,021                | 188.0            | 2,021                     | 3,234                     | 2,322                       |
| 285.00              | 2,021                | 188.0            | 2,021                     | 5,255                     | 2,510                       |
| 286.00              | 2,021                | 188.0            | 2,021                     | 7,276                     | 2,698                       |
| 287.00              | 2,021                | 188.0            | 2,021                     | 9,297                     | 2,886                       |
| 288.00              | 2,021                | 188.0            | 2,021                     | 11,318                    | 3,074                       |
| 289.00              | 2,021                | 188.0            | 2,021                     | 13,339                    | 3,262                       |
| 289.40              | 2,021                | 188.0            | 808                       | 14,147                    | 3,337                       |

8,985 cf Total Available Storage

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|---------------------------|---------------------------|-----------------------------|
| 283.00              | 250                  | 0                         | 0                         | 250                         |
| 284.00              | 250                  | 250                       | 250                       | 313                         |
| 285.00              | 250                  | 250                       | 500                       | 376                         |
| 285.50              | 250                  | 125                       | 625                       | 408                         |

| Device | Routing   | Invert  | Outlet Devices   |
|--------|-----------|---------|--|
| #1     | Discarded | 282.40' | 2.410 in/hr Exfiltration over Surface area                       |
| #2     | Primary   | 285.50' | 50.0' long x 2.5' breadth Broad-Crested Rectangular Weir         |
|        |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|        |           |         | 2.50 3.00 3.50 4.00  |
|        |           |         | Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74     |
|        |           |         | 2.76 2.89 3.05 3.19 3.32   |
| #3     | Device 2  | 284.10' | 24.0" Round Culvert  |
|        |           |         | L= 70.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |           |         | Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 |
|        |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf      |
| #4     | Device 3  | 284.10' | 20.0" W x 12.0" H Vert. Orifice/Grate C= 0.600                   |
|        |           |         | Limited to weir flow at low heads                                |
| #5     | Device 3  | 287.00' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |

**Discarded OutFlow** Max=0.1 cfs @ 10.72 hrs HW=283.00' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=8.0 cfs @ 12.19 hrs HW=286.49' TW=0.00' (Dynamic Tailwater) **2=Broad-Crested Rectangular Weir** (Passes 8.0 cfs of 130.8 cfs potential flow) **3=Culvert** (Passes 8.0 cfs of 11.9 cfs potential flow) 4=Orifice/Grate (Orifice Controls 8.0 cfs @ 4.80 fps)

-5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

# Summary for Pond IC-2:

| Inflow Area | a = | 134,287 sf, | 7.03% Impervious,  | Inflow Depth > 2.1 | 4" for 10-Year event     |
|-------------|-----|-------------|--------------------|--------------------|--------------------------|
| Inflow      | =   | 6.0 cfs @   | 12.17 hrs, Volume= | 23,897 cf          |                          |
| Outflow     | =   | 5.0 cfs @   | 12.24 hrs, Volume= | 21,924 cf, A       | Atten= 18%, Lag= 4.2 min |
| Discarded   | =   | 0.1 cfs @   | 10.36 hrs, Volume= | 4,567 cf           | -                        |
| Primary     | =   | 4.9 cfs @   | 12.24 hrs, Volume= | 17,357 cf          |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 299.12' @ 12.24 hrs Surf.Area= 1,497 sf Storage= 3,055 cf

Plug-Flow detention time= 60.9 min calculated for 21,924 cf (92% of inflow) Center-of-Mass det. time= 17.8 min ( 885.1 - 867.3 )

Five Paths, Tax Map 39, Parcel 15A, Wayland, MA NRCC 24-hr D 10-Year Rainfall=4.77"

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| Volume     | Invert    | Avail.Sto          | rage   | Storage  | Description               | n                        |                      |                   |                           |         |
|------------|-----------|--------------------|--------|--|---------------------------|--------------------------|----------------------|-------------------|---------------------------|---------|
| #1         | 295.80'   | 2,23               | 34 cf  | IC-2 Sto   | ne bed (Ir                | regular)                 | _isted be            | elow (F           | Recalc)                   |         |
|            |           |                    |        | 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids                |                           |                          |                      |                   |                           |         |
| #2         | 296.80'   | 3,14               | 43 cf  | ADS_St   | ormTech I                 | MC-4500                  | b +Cap               | @ 4.0             | 13' Lx 28 Ins             | ide #1  |
|            |           |                    |        | Effective Size= $90.4$ "W x $60.0$ "H => $26.46$ st x $4.03$ 'L = $106.6$ cf |                           |                          |                      |                   |                           |         |
|            |           |                    |        | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap                   |                           |                          |                      |                   |                           |         |
|            |           |                    |        | 28 Chan  | nbers in 2 i              | KOWS                     | . 0                  | - 150             | 0 of                      |         |
| #2         | 206.001   | 1-                 | 70 of  |  | rage= +39.                | (Durami                  | (Z TOWS              | = 158.            |                           |         |
| #3         | 290.00    | 1                  |        | 500 cf 0   | vorall - 71               | of Embe                  | ddod - /             | u Deiov<br>120 cf |                           | de      |
| <b>#</b> 4 | 296 00'   | -                  | 71 cf  | 18 0" R  | ound Pine                 | Storage                  | aueu – -<br>a Inside | #23 CI            | × 40.070 VOI              | 45      |
|            | 200.00    |                    |        | L= 40.0'   |                           | Otorug                   |                      |                   |                           |         |
|            |           | 5,62               | 20 cf  | Total Av   | ailable Sto               | rage                     |                      |                   |                           |         |
| Elevatio   | n Su      | ırf.Area P         | erim.  | Ir   | nc.Store                  | Curr                     | n.Store              |                   | Wet.Area                  |         |
| (fee       | t)        | (sq-ft)            | (feet) | (cul   | oic-feet)                 | (cubi                    | c-feet)              |                   | (sq-ft)                   |         |
| 295.8      | 0         | 1,247              | 165.0  |  | 0                         |                          | 0                    |                   | 1,247                     |         |
| 296.0      | 0         | 1,247              | 165.0  |  | 249                       |                          | 249                  |                   | 1,280                     |         |
| 297.0      | 0         | 1,247              | 165.0  |  | 1,247                     |                          | 1,496                |                   | 1,445                     |         |
| 298.0      |           | 1,247              | 165.0  |  | 1,247                     |                          | 2,743                |                   | 1,610                     |         |
| 299.0      |           | 1,247              | 165.0  |  | 1,247                     |                          | 5,990                |                   | 1,775                     |         |
| 301.0      | 0         | 1,247              | 165.0  |  | 1 247                     |                          | 5,257<br>6 484       |                   | 2 105                     |         |
| 302.0      | 0         | 1.247              | 165.0  |  | 1.247                     |                          | 7.731                |                   | 2,270                     |         |
| 302.8      | 0         | 1,247 <sup>-</sup> | 165.0  |  | 998                       |                          | 8,729                |                   | 2,402                     |         |
| Flevatio   | in Si     | Irf Area           | Inc    | Store  | Cum S                     | tore                     | Wet                  | Area              |                           |         |
| (fee       | t)        | (sa-ft)            | (cubic | c-feet)  | (cubic-f                  | feet)                    | (                    | (sa-ft)           |                           |         |
| 296.0      | 0         | 250                | 1      | 0  | (                         | 0                        |                      | 250               |                           |         |
| 297.0      | 0         | 250                |        | 250  |                           | 250                      |                      | 313               |                           |         |
| 298.0      | 0         | 250                |        | 250  |                           | 500                      |                      | 376               |                           |         |
| Device     | Routing   | Invert             | Outle  | et Device:   | S                         |                          |                      |                   |                           |         |
| #1         | Discarded | 295.80'            | 2.41   | 0 in/hr Ex   | filtration                | over Sur                 | face are             | ea                |                           |         |
| #2         | Primary   | 298.00'            | 50.0   | long x 2   | 2.0' breadt               | h Broad                  | -Creste              | d Rect            | angular Wei               | ir      |
|            | -         |                    | Head   | d (feet) 0   | .20 0.40 (                | 0.60 0.80                | 0 1.00               | 1.20 1            | .40 1.60 1.8              | 30 2.00 |
|            |           |                    | 2.50   | 3.00 3.5   | 50                        |                          |                      |                   |                           |         |
|            |           |                    | Coef   | . (English   | i) 2.54 2.6               | 51 2.61                  | 2.60 2.0             | 66 2.7            | 0 2.77 2.89               | 2.88    |
| що         | Davias 2  |                    | 2.85   | 3.07 3.2   | 20 3.32                   |                          |                      |                   |                           |         |
| #3         | Device 2  | 296.50             | 18.0   |  |                           | a no hor                 | adwall               | Ka- 0 (           | 000                       |         |
|            |           |                    | L- Z   | / Outlet li  | °, projecim<br>nvert≘ 206 | 9, 110 1100<br>50' / 206 | 30Wall,<br>S 00' S=  | - 0.025           | 500<br>50 '/'     Cc= 0 9 | 200     |
|            |           |                    | n=0    | .013 Cor   | rugated PF                | = smooth                 | n interior           | Elow              | / Area= 1 77              | sf      |
| #4         | Device 3  | 296.50'            | 23.0   | "W x 6.0   | " H Vert. C               | Drifice/G                | rate C=              | = 0.600           | )                         |         |
|            |           |                    | Limit  | ed to wei  | r flow at lo              | w heads                  |                      |                   |                           |         |
| #5         | Device 3  | 299.90'            | 4.0' l | ong Sha  | rp-Crested                | d Vee/Tra                | ap Weir              | Cv= 2             | .62 (C= 3.28              | )       |
|            |           |                    |        |  |                           |                          |                      |                   |                           |         |

**Discarded OutFlow** Max=0.1 cfs @ 10.36 hrs HW=296.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=4.9 cfs @ 12.24 hrs HW=299.12' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Passes 4.9 cfs of 158.3 cfs potential flow) 3=Culvert (Passes 4.9 cfs of 7.1 cfs potential flow) 4=Orifice/Grate (Orifice Controls 4.9 cfs @ 5.09 fps) 5=Sharp-Crested Vee/Trap Weir (Controls 0.0 cfs)

# Summary for Pond SD-1:

| Inflow Area | ı = | 3,729 sf, | 47.63% Impe   | ervious, | Inflow Depth > | • 3.  | 15" fo | r 10- | Year eve | ent   |
|-------------|-----|-----------|---------------|----------|----------------|-------|--------|-------|----------|-------|
| Inflow      | =   | 0.3 cfs @ | 12.12 hrs, Vo | olume=   | 979            | ) cf  |        |       |          |       |
| Outflow     | =   | 0.3 cfs @ | 12.12 hrs, Vo | olume=   | 943            | 3 cf, | Atten= | 0%,   | Lag= 0.0 | ) min |
| Discarded   | =   | 0.0 cfs @ | 9.46 hrs, Vo  | olume=   | 364            | l cf  |        |       |          |       |
| Primary     | =   | 0.3 cfs @ | 12.12 hrs, Vo | olume=   | 579            | ) cf  |        |       |          |       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.92' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= 31.2 min calculated for 943 cf (96% of inflow) Center-of-Mass det. time= 9.5 min (835.2 - 825.7)

| Volume           | Invert               | Avail.St           | torage   | Storage Descriptio   | 'n   |  |  |  |
|------------------|----------------------|--------------------|--|--|--|--|--|--|
| #1               | 300.00'              |                    | 44 cf  | 44 cf <b>Custom Stage Data (Irregular)</b> Listed below (Recalc) 109 cf Overall x 40.0% Voids  |  |  |  |  |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft)  |  |  |
| 300.0<br>301.0   | )0<br>)0             | 109<br>109         | 113.3<br>113.3   | 0<br>109   | 0<br>109   | 109<br>222   |  |  |
| Device           | Routing              | Inver              | t Outle  | et Devices   |  |  |  |  |
| #1<br>#2         | Discarded<br>Primary | 300.00<br>300.90   | ' <b>2.41</b><br>' <b>55.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40<br>3.00 3.50 4.00 4<br>f. (English) 2.38 2.5<br>2.72 2.73 2.76 2 | over Surface are     th Broad-Crester     0.60   0.80   1.00     .50   5.00   5.50     54   2.69   2.68   2.6     .79   2.88   3.07   3. | ea<br>d Rectangular Weir<br>1.20 1.40 1.60 1.80 2.00<br>67 2.67 2.65 2.66 2.66<br>32 |  |  |

**Discarded OutFlow** Max=0.0 cfs @ 9.46 hrs HW=300.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=300.92' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 0.3 cfs @ 0.31 fps)

# Summary for Pond SD-2:

| Inflow Area | a = | 4,504 sf, | 4.43% Impervious,  | Inflow Depth > 2.18" for | 10-Year event   |
|-------------|-----|-----------|--------------------|--------------------------|-----------------|
| Inflow      | =   | 0.3 cfs @ | 12.12 hrs, Volume= | 818 cf                   |                 |
| Outflow     | =   | 0.3 cfs @ | 12.12 hrs, Volume= | 803 cf, Atten= 0         | %, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 9.58 hrs, Volume=  | 123 cf                   | -               |
| Primary     | =   | 0.3 cfs @ | 12.12 hrs, Volume= | 681 cf                   |                 |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 303.43' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 4.3 min ( 869.1 - 864.8 )

| Volume           | Invert               | Avail.Sto            | rage   | Storage Description   | ו   |   |
|------------------|----------------------|----------------------|--|---|---|---|
| #1               | 302.50'              |                      | 16 cf  | <b>Custom Stage Dat</b><br>40 cf Overall x 40.0   | <b>a (Irregular)</b> Listed<br>)% Voids   | below (Recalc)  |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area P<br>(sq-ft) | Perim.<br>(feet)                             | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)   |
| 302.9<br>303.9   | 50<br>50             | 40<br>40             | 44.0<br>44.0                                 | 0<br>40   | 0<br>40   | 40<br>84  |
| Device           | Routing              | Invert               | Outle  | et Devices  |   |   |
| #1<br>#2         | Discarded<br>Primary | 302.50'<br>303.40'   | 2.41<br>20.0<br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration of</b><br><b>long x 4.0' breadt</b><br>d (feet) 0.20 0.40 0<br>3.00 3.50 4.00 4.5<br>(English) 2.38 2.5<br>2.72 2.73 2.76 2.5 | Surface area     Broad-Crested I     0.60   0.80   1.00   1.2     50   5.00   5.50     4   2.69   2.68   2.67     79   2.88   3.07   3.32 | <b>Rectangular Weir</b><br>20 1.40 1.60 1.80 2.00<br>2.67 2.65 2.66 2.66<br>2 |

**Discarded OutFlow** Max=0.0 cfs @ 9.58 hrs HW=302.51' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=303.43' TW=0.00' (Dynamic Tailwater) ←2=Broad-Crested Rectangular Weir (Weir Controls 0.3 cfs @ 0.42 fps)

# Summary for Link AP1:

| Inflow A | rea = | 224,752 sf, | 11.85% Impervious, | Inflow Depth > | 1.62"    | for 10-Year event    |
|----------|-------|-------------|--------------------|----------------|----------|----------------------|
| Inflow   | =     | 10.0 cfs @  | 12.17 hrs, Volume= | 30,413         | cf       |                      |
| Primary  |       | 10.0 cfs @  | 12.17 hrs, Volume= | 30,413         | cf, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

# Summary for Link AP2:

| Inflow / | Area | = | 42,170 sf, | 25.53% Im  | pervious, | Inflow Depth > | 2.  | .15" for 1 | 0-Year event   |   |
|----------|------|---|------------|------------|-----------|----------------|-----|------------|----------------|---|
| Inflow   |      | = | 2.4 cfs @  | 12.13 hrs, | Volume=   | 7,554          | cf  |            |                |   |
| Primar   | у    | = | 2.4 cfs @  | 12.13 hrs, | Volume=   | 7,554          | cf, | Atten= 0%  | , Lag= 0.0 mir | ſ |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### **Summary for Link AP3:**

| Inflow A | rea = | = | 196,746 sf, | 5.32% Impervious,  | Inflow Depth > | 1.67"  | for 10-Year event    |
|----------|-------|---|-------------|--------------------|----------------|--------|----------------------|
| Inflow   | =     |   | 7.3 cfs @   | 12.21 hrs, Volume= | 27,435 c       | f      |                      |
| Primary  | =     |   | 7.3 cfs @   | 12.21 hrs, Volume= | 27,435 c       | f, Att | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### Summary for Link AP4:

| Inflow Are | a = | 14,618 sf, | 41.41% Impervious, | Inflow Depth > | 2.80"   | for 10-Year event   |
|------------|-----|------------|--------------------|----------------|---------|---------------------|
| Inflow     | =   | 0.8 cfs @  | 12.16 hrs, Volume= | 3,412 c        | f       |                     |
| Primary    | =   | 0.8 cfs @  | 12.16 hrs, Volume= | 3,412 c        | f, Atte | n= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.1:  | Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>3.40"<br>Flow Length=549' Tc=7.5 min CN=76 Runoff=4.5 cfs 15,439 cf             |
|---------------------|--|
| SubcatchmentSC1.2:  | Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>3.20"<br>Flow Length=510' Tc=6.7 min CN=74 Runoff=9.2 cfs 30,837 cf             |
| SubcatchmentSC1.3:  | Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>5.67"<br>Tc=5.0 min CN=97 Runoff=0.7 cfs 2,663 cf                                |
| SubcatchmentSC1.4:  | Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>5.79"<br>Tc=5.0 min CN=98 Runoff=0.3 cfs 1,065 cf                               |
| SubcatchmentSC1.5:  | Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>2.92"<br>Flow Length=337' Tc=6.4 min CN=71 Runoff=3.4 cfs 11,238 cf              |
| SubcatchmentSC1.6:  | Runoff Area=622 sf 100.00% Impervious Runoff Depth>5.79"<br>Tc=5.0 min CN=98 Runoff=0.1 cfs 300 cf                                   |
| SubcatchmentSC2.1:  | Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>4.33"<br>Flow Length=68' Tc=5.0 min CN=85 Runoff=0.4 cfs 1,344 cf                |
| Subcatchment SC2.2: | Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>3.20"<br>Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=3.1 cfs 10,262 cf |
| SubcatchmentSC3.1:  | Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>3.10"<br>Flow Length=564' Tc=10.4 min CN=73 Runoff=4.5 cfs 17,292 cf             |
| SubcatchmentSC3.2:  | Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>2.91"<br>Flow Length=378' Tc=10.1 min CN=71 Runoff=3.5 cfs 13,364 cf             |
| SubcatchmentSC3.3:  | Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>2.91"<br>Flow Length=287' Tc=10.8 min CN=71 Runoff=3.9 cfs 15,156 cf             |
| SubcatchmentSC3.4:  | Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>4.43"<br>Flow Length=246' Tc=5.0 min CN=86 Runoff=1.4 cfs 4,560 cf              |
| SubcatchmentSC4.1:  | Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>3.21"<br>Flow Length=64' Tc=5.0 min CN=74 Runoff=0.4 cfs 1,203 cf                 |
| SubcatchmentSC4.2:  | Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>4.42"<br>Flow Length=75' Tc=12.7 min CN=86 Runoff=0.9 cfs 3,727 cf              |
| Pond CB1:           | Peak Elev=298.30' Inflow=0.3 cfs 1,065 cf<br>12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.3 cfs 1,065 cf              |
| Pond CB2:           | Peak Elev=288.85' Inflow=0.7 cfs 2,663 cf<br>12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=0.7 cfs 2.663 cf                |

| Post-Dev Rev 2  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA<br>NRCC 24-hr D 25-Year Rainfall=6.03"   |
|---|--|
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| Pond DCB3:  | Peak Elev=289.32' Storage=2 cf Inflow=9.2 cfs 30,837 cf<br>24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=9.2 cfs 30,837 cf            |
| Pond DCB4:  | Peak Elev=288.79' Storage=2 cf Inflow=4.5 cfs 15,439 cf<br>15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=4.5 cfs 15,439 cf            |
| Pond DCB5:  | Peak Elev=300.30' Inflow=4.5 cfs 17,292 cf<br>21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=4.5 cfs 17,292 cf                         |
| Pond DCB6:  | Peak Elev=300.14' Inflow=1.4 cfs 4,560 cf<br>21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=1.4 cfs 4,560 cf                            |
| Pond DCB7:  | Peak Elev=300.30' Inflow=3.5 cfs 13,364 cf<br>18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=3.5 cfs 13,364 cf                          |
| Pond DMH1:  | Peak Elev=288.73' Inflow=10.2 cfs 34,565 cf<br>24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=10.2 cfs 34,565 cf                       |
| Pond DMH2:  | Peak Elev=300.14' Inflow=5.5 cfs 21,852 cf<br>30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=5.5 cfs 21,852 cf                          |
| Pond IC-1:  | Peak Elev=287.27' Storage=7,020 cf Inflow=14.6 cfs 50,003 cf<br>Discarded=0.1 cfs 7,831 cf Primary=12.6 cfs 37,638 cf Outflow=12.7 cfs 45,469 cf |
| Pond IC-2:  | Peak Elev=300.08' Storage=3,920 cf Inflow=8.9 cfs 35,217 cf<br>Discarded=0.1 cfs 4,932 cf Primary=7.7 cfs 28,308 cf Outflow=7.8 cfs 33,240 cf    |
| Pond SD-1:  | Peak Elev=300.92' Storage=40 cf Inflow=0.4 cfs 1,344 cf<br>Discarded=0.0 cfs 391 cf Primary=0.4 cfs 913 cf Outflow=0.4 cfs 1,305 cf              |
| Pond SD-2:  | Peak Elev=303.44' Storage=15 cf Inflow=0.4 cfs 1,203 cf<br>Discarded=0.0 cfs 133 cf Primary=0.4 cfs 1,056 cf Outflow=0.4 cfs 1,189 cf            |
| Link AP1:   | Inflow=15.5 cfs 49,176 cf<br>Primary=15.5 cfs 49,176 cf  |
| Link AP2:   | Inflow=3.5 cfs 11,176 cf<br>Primary=3.5 cfs 11,176 cf  |
| Link AP3:   | Inflow=11.3 cfs 43,464 cf<br>Primary=11.3 cfs 43,464 cf  |
| Link AP4:   | Inflow=1.1 cfs 4,783 cf<br>Primary=1.1 cfs 4,783 cf  |

Total Runoff Area = 478,286 sf Runoff Volume = 128,452 cf Average Runoff Depth = 3.22" 88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf

#### Summary for Subcatchment SC1.1:

Runoff = 4.5 cfs @ 12.15 hrs, Volume= 15,439 cf, Depth> 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| A     | rea (sf)                    | CN      | Description |              |                                    |
|-------|-----------------------------|---------|-------------|--------------|------------------------------------|
|       | 24,785                      | 74      | >75% Gras   | s cover, Go  | ood, HSG C                         |
|       | 21,721                      | 70      | Woods, Go   | od, HSG C    |                                    |
|       | 14                          | 89      | Gravel road | ls, HSG C    |                                    |
|       | 6,226                       | 98      | Paved park  | ing, HSG C   |                                    |
|       | 1,776                       | 98      | Roofs, HSC  | G C          |                                    |
|       | 54,522                      | 76      | Weighted A  | verage       |                                    |
|       | 46,520 85.32% Pervious Area |         |             | vious Area   |                                    |
|       | 8,002 14.68% Impervious Are |         |             | pervious Are | ea                                 |
|       |                             |         |             |              |                                    |
| Tc    | Length                      | Slope   | Velocity    | Capacity     | Description                        |
| (min) | (feet)                      | (ft/ft) | (ft/sec)    | (cfs)        |                                    |
| 0.9   | 50                          | 0.0100  | 0.90        |              | Sheet Flow,                        |
|       |                             |         |             |              | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 35                          | 0.0200  | 2.87        |              | Shallow Concentrated Flow,         |
|       |                             |         |             |              | Paved Kv= 20.3 fps                 |
| 0.6   | 50                          | 0.0345  | 1.30        |              | Shallow Concentrated Flow,         |
|       |                             |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 1.5   | 180                         | 0.1550  | 1.97        |              | Shallow Concentrated Flow,         |
|       |                             |         |             |              | Woodland Kv= 5.0 fps               |
| 4.3   | 234                         | 0.0170  | 0.91        |              | Shallow Concentrated Flow,         |
|       |                             |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 7.5   | 549                         | Total   |             |              |                                    |

# **Summary for Subcatchment SC1.2:**

|  | Runoff | = | 9.2 cfs @ | 12.14 hrs, Volume= | 30,837 cf, Depth> 3 | .20" |
|--|--------|---|-----------|--------------------|---------------------|------|
|--|--------|---|-----------|--------------------|---------------------|------|

| Area (sf) | CN | Description                   |  |  |  |
|-----------|----|-------------------------------|--|--|--|
| 46,703    | 74 | >75% Grass cover, Good, HSG C |  |  |  |
| 57,729    | 70 | Noods, Good, HSG C            |  |  |  |
| 967       | 89 | Gravel roads, HSG C           |  |  |  |
| 313       | 98 | nconnected pavement, HSG C    |  |  |  |
| 7,362     | 98 | aved parking, HSG C           |  |  |  |
| 2,449     | 98 | Roofs, HSG C                  |  |  |  |
| 115,523   | 74 | Weighted Average              |  |  |  |
| 105,398   |    | 91.24% Pervious Area          |  |  |  |
| 10,124    |    | 8.76% Impervious Area         |  |  |  |
| 313       |    | 3.09% Unconnected             |  |  |  |

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| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description                     |
|-------------|------------------|------------------|----------------------|-------------------|---------------------------------|
| 3.6         | 50               | 0.0600           | 0.23                 |                   | Sheet Flow,                     |
|             |                  |                  |                      |                   | Grass: Short n= 0.150 P2= 3.16" |
| 1.3         | 167              | 0.0988           | 2.20                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 0.8         | 117              | 0.1200           | 2.42                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Short Grass Pasture Kv= 7.0 fps |
| 1.0         | 176              | 0.0400           | 3.00                 |                   | Shallow Concentrated Flow,      |
|             |                  |                  |                      |                   | Grassed Waterway Kv= 15.0 fps   |
| 6.7         | 510              | Total            |                      |                   |                                 |

# Summary for Subcatchment SC1.3:

| Runoff | = | 0.7 cfs @ | 12.12 hrs, | Volume= | 2,663 cf, | Depth> | 5.67" |
|--------|---|-----------|------------|---------|-----------|--------|-------|

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| A           | rea (sf)         | CN            | Description               |                      |               |  |  |  |  |
|-------------|------------------|---------------|---------------------------|----------------------|---------------|--|--|--|--|
|             | 162              | 74            | >75% Gras                 | s cover, Go          | bod, HSG C    |  |  |  |  |
|             | 243              | 89            | Gravel road               | Gravel roads, HSG C  |               |  |  |  |  |
|             | 5,233            | 98            | Paved park                | Paved parking, HSG C |               |  |  |  |  |
|             | 5,639            | 97            | Weighted A                | verage               |               |  |  |  |  |
|             | 405              |               | 7.19% Perv                | vious Area           |               |  |  |  |  |
|             | 5,233            |               | 92.81% Imp                | pervious Are         | ea            |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slop<br>(ft/f | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs)    | Description   |  |  |  |  |
| 5.0         |                  |               |                           |                      | Direct Entry, |  |  |  |  |
|             |                  |               |                           |                      |               |  |  |  |  |

# Summary for Subcatchment SC1.4:

Runoff = 0.3 cfs @ 12.12 hrs, Volume= 1,065 cf, Depth> 5.79"

| Α           | rea (sf)         | CN               | Description             |                   |               |  |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|---------------|--|--|--|--|
|             | 2,208            | 98               | 98 Paved parking, HSG C |                   |               |  |  |  |  |
|             | 2,208            |                  | 100.00% Impervious Area |                   |               |  |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description   |  |  |  |  |
| 5.0         |                  |                  |                         |                   | Direct Entry, |  |  |  |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 25-Year Rainfall=6.03"             |
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#### Summary for Subcatchment SC1.5:

Runoff = 3.4 cfs @ 12.14 hrs, Volume= 11,238 cf, Depth> 2.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| A     | rea (sf) | CN I    | Description           |             |                                 |  |  |  |  |  |
|-------|----------|---------|-----------------------|-------------|---------------------------------|--|--|--|--|--|
|       | 37,139   | 70      | 70 Woods, Good, HSG C |             |                                 |  |  |  |  |  |
|       | 441      | 98 I    | Jnconnecte            | ed pavemer  | nt, HSG C                       |  |  |  |  |  |
|       | 8,658    | 74 >    | >75% Gras             | s cover, Go | bod, HSG C                      |  |  |  |  |  |
|       | 46,238   | 71 \    | 71 Weighted Average   |             |                                 |  |  |  |  |  |
|       | 45,797   | 9       | 99.05% Pei            | vious Area  |                                 |  |  |  |  |  |
|       | 441      | (       | ).95% Impe            | ervious Are | a                               |  |  |  |  |  |
|       | 441      |         | 100.00% Ü             | nconnected  | 1                               |  |  |  |  |  |
|       |          |         |                       |             |                                 |  |  |  |  |  |
| Тс    | Length   | Slope   | Velocity              | Capacity    | Description                     |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)              | (cfs)       |                                 |  |  |  |  |  |
| 3.3   | 50       | 0.0800  | 0.26                  |             | Sheet Flow,                     |  |  |  |  |  |
|       |          |         |                       |             | Grass: Short n= 0.150 P2= 3.16" |  |  |  |  |  |
| 3.1   | 287      | 0.0941  | 1.53                  |             | Shallow Concentrated Flow,      |  |  |  |  |  |
|       |          |         |                       |             | Woodland Kv= 5.0 fps            |  |  |  |  |  |
| 6.4   | 207      | Tatal   |                       |             |                                 |  |  |  |  |  |

6.4 337 Total

#### Summary for Subcatchment SC1.6:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 300 cf, Depth> 5.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| Area (sf)                 | CN             | Description              |                   |               |  |  |  |  |
|---------------------------|----------------|--------------------------|-------------------|---------------|--|--|--|--|
| 622                       | 98             | 98 Paved parking, HSG C  |                   |               |  |  |  |  |
| 622                       |                | 100.00% In               | npervious A       | Area          |  |  |  |  |
| Tc Length<br>(min) (feet) | Slop<br>(ft/fl | e Velocity<br>) (ft/sec) | Capacity<br>(cfs) | Description   |  |  |  |  |
| 5.0                       |                |                          |                   | Direct Entry, |  |  |  |  |

# **Summary for Subcatchment SC2.1:**

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,344 cf, Depth> 4.33"

Description Area (sf) CN >75% Grass cover, Good, HSG C 1,953 74 1,776 Roofs, HSG C 98 3,729 85 Weighted Average 1,953 52.37% Pervious Area 1,776 47.63% Impervious Area Тс Length Slope Velocity Capacity Description (min) (feet) (ft/ft) (ft/sec) (cfs) 4.3 50 0.0400 0.19 Sheet Flow, Grass: Short n= 0.150 P2= 3.16" 0.2 18 0.0300 1.21 Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps 4.5 68 Total. Increased to minimum Tc = 5.0 minSummary for Subcatchment SC2.2: Runoff 3.1 cfs @ 12.14 hrs, Volume= 10.262 cf. Depth> 3.20" Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03" Area (sf) CN Adi Description 7.180 74 >75% Grass cover, Good, HSG C 22,269 70 Woods, Good, HSG C 8,992 98 Unconnected pavement, HSG C Weighted Average, UI Adjusted 38.441 77 74 29,449 76.61% Pervious Area 8,992 23.39% Impervious Area 8,992 100.00% Unconnected Slope Tc Length Velocitv Capacity Description (ft/ft) (min) (feet) (ft/sec) (cfs) 0.0200 Sheet Flow, 5.7 50 0.15 Grass: Short n= 0.150 P2= 3.16" 0.2 29 0.1700 2.89 Shallow Concentrated Flow. Short Grass Pasture Kv= 7.0 fps 0.5 61 0.1800 2.12 Shallow Concentrated Flow.

#### Summary for Subcatchment SC3.1:

Woodland Kv= 5.0 fps

Runoff 4.5 cfs @ 12.18 hrs, Volume= 17,292 cf, Depth> 3.10" =

Total

140

6.4

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| A     | rea (sf) | CN      | Description                      |              |                                 |  |  |  |  |  |
|-------|----------|---------|----------------------------------|--------------|---------------------------------|--|--|--|--|--|
|       | 32,168   | 74      | 74 >75% Grass cover, Good, HSG C |              |                                 |  |  |  |  |  |
|       | 31,971   | 70      | 70 Woods, Good, HSG C            |              |                                 |  |  |  |  |  |
|       | 364      | 89      | Gravel road                      | ls, HSG C    |                                 |  |  |  |  |  |
|       | 55       | 98      | Paved park                       | ing, HSG C   |                                 |  |  |  |  |  |
|       | 2,321    | 98      | Roofs, HSC                       | S C          |                                 |  |  |  |  |  |
|       | 66,880   | 73      | Neighted A                       | verage       |                                 |  |  |  |  |  |
|       | 64,504   | 9       | 96.45% Pei                       | vious Area   |                                 |  |  |  |  |  |
|       | 2,376    | ;       | 3.55% Impe                       | ervious Area | а                               |  |  |  |  |  |
|       |          |         |                                  |              |                                 |  |  |  |  |  |
| Тс    | Length   | Slope   | Velocity                         | Capacity     | Description                     |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                 |  |  |  |  |  |
| 5.7   | 50       | 0.0200  | 0.15                             |              | Sheet Flow,                     |  |  |  |  |  |
|       |          |         |                                  |              | Grass: Short n= 0.150 P2= 3.16" |  |  |  |  |  |
| 2.1   | 247      | 0.0800  | 1.98                             |              | Shallow Concentrated Flow,      |  |  |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps |  |  |  |  |  |
| 1.5   | 133      | 0.0830  | 1.44                             |              | Shallow Concentrated Flow,      |  |  |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps            |  |  |  |  |  |
| 1.1   | 134      | 0.0820  | 2.00                             |              | Shallow Concentrated Flow,      |  |  |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps |  |  |  |  |  |

10.4 564 Total

# Summary for Subcatchment SC3.2:

Runoff = 3.5 cfs @ 12.18 hrs, Volume= 13,364 cf, Depth> 2.91"

| A     | rea (sf) | CN      | Description                      |              |  |  |  |  |  |  |
|-------|----------|---------|----------------------------------|--------------|--|--|--|--|--|--|
|       | 12,832   | 74      | 74 >75% Grass cover, Good, HSG C |              |  |  |  |  |  |  |
|       | 880      | 98      | Roofs, HSG                       | ЭС           |  |  |  |  |  |  |
|       | 41,349   | 70      | Woods, Go                        | od, HSG C    |  |  |  |  |  |  |
|       | 55,060   | 71      | Weighted A                       | verage       |  |  |  |  |  |  |
|       | 54,180   | 1       | 98.40% Pei                       | vious Area   |  |  |  |  |  |  |
|       | 880      |         | 1.60% Impe                       | ervious Area | а  |  |  |  |  |  |
|       |          |         |                                  |              |  |  |  |  |  |  |
| Tc    | Length   | Slope   | Velocity                         | Capacity     | Description                                |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |  |  |  |  |  |  |
| 7.1   | 50       | 0.0800  | 0.12                             |              | Sheet Flow,                                |  |  |  |  |  |
|       |          |         |                                  |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |  |  |
| 1.7   | 204      | 0.1600  | 2.00                             |              | Shallow Concentrated Flow,                 |  |  |  |  |  |
|       |          |         |                                  |              | Woodland Kv= 5.0 fps                       |  |  |  |  |  |
| 1.3   | 124      | 0.0530  | 1.61                             |              | Shallow Concentrated Flow,                 |  |  |  |  |  |
|       |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps            |  |  |  |  |  |
| 10.1  | 378      | Total   |                                  |              |  |  |  |  |  |  |

|   | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|---|---|
| Post-Dev Rev 2                                      | NRCC 24-hr D 25-Year Rainfall=6.03"             |
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# Summary for Subcatchment SC3.3:

Runoff = 3.9 cfs @ 12.18 hrs, Volume= 15,156 cf, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| A                           | rea (sf)         | CN [             | Description                      |                   |   |  |  |  |  |  |  |
|-----------------------------|------------------|------------------|----------------------------------|-------------------|---|--|--|--|--|--|--|
|                             | 12,393           | 74 >             | 74 >75% Grass cover, Good, HSG C |                   |   |  |  |  |  |  |  |
|                             | 49,047           | 70 \             | Voods, Go                        | od, HSG C         |   |  |  |  |  |  |  |
|                             | 1,019            | 98 l             | Jnconnecte                       | ed pavemer        | nt, HSG C   |  |  |  |  |  |  |
|                             | 62,459           | 71 \             | Veighted A                       | verage            |   |  |  |  |  |  |  |
| 61,440 98.37% Pervious Area |                  |                  |                                  |                   |   |  |  |  |  |  |  |
|                             | 1,019            |                  | l.63% Impe                       | ervious Area      | а   |  |  |  |  |  |  |
|                             | 1,019            | -                | 100.00% Ui                       | nconnected        | 1   |  |  |  |  |  |  |
| Tc<br>(min)                 | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)             | Capacity<br>(cfs) | Description   |  |  |  |  |  |  |
| 8.6                         | 50               | 0.0500           | 0.10                             |                   | Sheet Flow,   |  |  |  |  |  |  |
| 2.2                         | 237              | 0.1350           | 1.84                             |                   | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |  |  |  |  |  |  |
| 10.8                        | 287              | Total            |                                  |                   |   |  |  |  |  |  |  |

# Summary for Subcatchment SC3.4:

Runoff = 1.4 cfs @ 12.12 hrs, Volume= 4,560 cf, Depth> 4.43"

| A            | rea (sf) | CN [    | Description                      |              |                                    |  |  |  |  |  |
|--------------|----------|---------|----------------------------------|--------------|------------------------------------|--|--|--|--|--|
|              | 5,554    | 74 >    | 74 >75% Grass cover, Good, HSG C |              |                                    |  |  |  |  |  |
|              | 529      | 70 \    | Voods, Go                        | od, HSG C    |                                    |  |  |  |  |  |
|              | 76       | 89 (    | Gravel road                      | s, HSG C     |                                    |  |  |  |  |  |
|              | 6,187    | 98 F    | Paved park                       | ing, HSG C   |                                    |  |  |  |  |  |
|              | 12,347   | 86 N    | 86 Weighted Average              |              |                                    |  |  |  |  |  |
|              | 6,159    | 2       | 19.89% Per                       | vious Area   |                                    |  |  |  |  |  |
|              | 6,187    | 5       | 50.11% Imp                       | pervious Are | ea                                 |  |  |  |  |  |
|              |          |         |                                  |              |                                    |  |  |  |  |  |
| Tc           | Length   | Slope   | Velocity                         | Capacity     | Description                        |  |  |  |  |  |
| <u>(min)</u> | (feet)   | (ft/ft) | (ft/sec)                         | (cfs)        |                                    |  |  |  |  |  |
| 1.3          | 113      | 0.0200  | 1.40                             |              | Sheet Flow,                        |  |  |  |  |  |
|              |          |         |                                  |              | Smooth surfaces n= 0.011 P2= 3.16" |  |  |  |  |  |
| 2.4          | 38       | 0.1000  | 0.27                             |              | Sheet Flow,                        |  |  |  |  |  |
|              |          |         |                                  |              | Grass: Short n= 0.150 P2= 3.16"    |  |  |  |  |  |
| 0.9          | 95       | 0.0600  | 1.71                             |              | Shallow Concentrated Flow,         |  |  |  |  |  |
|              |          |         |                                  |              | Short Grass Pasture Kv= 7.0 fps    |  |  |  |  |  |
| 4.6          | 246      | Total,  | Increased t                      | o minimum    | Tc = 5.0 min                       |  |  |  |  |  |

#### Summary for Subcatchment SC4.1:

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,203 cf, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 25-Year Rainfall=6.03"

| A          | rea (sf) | CN I                        | Description              |              |   |  |  |  |  |  |
|------------|----------|-----------------------------|--------------------------|--------------|---|--|--|--|--|--|
|            | 1,020    | 70                          | 70 Woods, Good, HSG C    |              |   |  |  |  |  |  |
|            | 200      | 98 I                        | Jnconnecte               | ed pavemer   | nt, HSG C   |  |  |  |  |  |
|            | 3,285    | 74 >                        | >75% Gras                | s cover, Go  | ood, HSG C  |  |  |  |  |  |
|            | 4,504    | 74                          | 74 Weighted Average      |              |   |  |  |  |  |  |
|            | 4,305    | ę                           | 95.57% Pervious Area     |              |   |  |  |  |  |  |
|            | 200      | 4                           | 1.43% Impe               | ervious Area | а   |  |  |  |  |  |
|            | 200      |                             | 100.00% Üi               | nconnected   |   |  |  |  |  |  |
|            |          |                             |                          |              |   |  |  |  |  |  |
| Tc         | Length   | Slope                       | Velocity                 | Capacity     | Description   |  |  |  |  |  |
| (min)      | (feet)   | / 51 / 51 \                 | (6)                      | / <b>-</b> \ |   |  |  |  |  |  |
|            |          | (ft/ft)                     | (IT/Sec)                 | (cfs)        |   |  |  |  |  |  |
| 3.6        | 50       | (ft/ft)<br>0.0600           | (ft/sec)<br>0.23         | (cts)        | Sheet Flow,   |  |  |  |  |  |
| 3.6        | 50       | (ft/ft)<br>0.0600           | <u>(π/sec)</u><br>0.23   | (cts)        | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"  |  |  |  |  |  |
| <u> </u>   | 50<br>14 | 0.0600<br>0.0400            | 0.23<br>1.40             | (cts)        | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,                                    |  |  |  |  |  |
| 3.6<br>0.2 | 50<br>14 | (ft/ft)<br>0.0600<br>0.0400 | (ft/sec)<br>0.23<br>1.40 | (cts)        | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Short Grass Pasture Kv= 7.0 fps |  |  |  |  |  |

# **Summary for Subcatchment SC4.2:**

Runoff = 0.9 cfs @ 12.20 hrs, Volume= 3,727 cf, Depth> 4.42"

| A     | rea (sf) | CN [    | Description           |              |  |  |  |  |  |  |  |
|-------|----------|---------|-----------------------|--------------|--|--|--|--|--|--|--|
|       | 3,927    | 70 \    | 70 Woods, Good, HSG C |              |  |  |  |  |  |  |  |
|       | 5,854    | 98 l    | Jnconnecte            | ed pavemer   | nt, HSG C                                  |  |  |  |  |  |  |
|       | 333      | 74 >    | <u>&gt;75% Gras</u>   | s cover, Go  | ood, HSG C                                 |  |  |  |  |  |  |
|       | 10,114   | 86 \    | Veighted A            | verage       |  |  |  |  |  |  |  |
|       | 4,260    | 2       | 2.12% Pe              | vious Area   |  |  |  |  |  |  |  |
|       | 5,854    | Ę       | 57.88% Imp            | pervious Are | ea   |  |  |  |  |  |  |
|       | 5,854    |         | 100.00% Ui            | nconnected   | 1  |  |  |  |  |  |  |
| _     |          |         |                       | _            |  |  |  |  |  |  |  |
| Tc    | Length   | Slope   | Velocity              | Capacity     | Description                                |  |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)              | (cfs)        |  |  |  |  |  |  |  |
| 12.4  | 50       | 0.0200  | 0.07                  |              | Sheet Flow,                                |  |  |  |  |  |  |
|       |          |         |                       |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |  |  |  |
| 0.3   | 25       | 0.0800  | 1.41                  |              | Shallow Concentrated Flow,                 |  |  |  |  |  |  |
|       |          |         |                       |              | Woodland Kv= 5.0 fps                       |  |  |  |  |  |  |
| 12.7  | 75       | Total   |                       |              |  |  |  |  |  |  |  |
|       |          |         |                       |              |  |  |  |  |  |  |  |

# Summary for Pond CB1:

| Inflow Are | a = | 2,208 sf, | 100.00% Im | pervious, | Inflow Depth > | 5.79"    | for 25- | Year event   |
|------------|-----|-----------|------------|-----------|----------------|----------|---------|--------------|
| Inflow     | =   | 0.3 cfs @ | 12.12 hrs, | Volume=   | 1,065          | cf       |         |              |
| Outflow    | =   | 0.3 cfs @ | 12.12 hrs, | Volume=   | 1,065          | cf, Atte | n= 0%,  | Lag= 0.0 min |
| Primary    | =   | 0.3 cfs @ | 12.12 hrs, | Volume=   | 1,065          | cf       |         | -            |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.30' @ 12.12 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 298.00' | <b>12.0" Round Culvert</b><br>L= 220.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.3 cfs @ 12.12 hrs HW=298.30' TW=288.68' (Dynamic Tailwater) -1=Culvert (Inlet Controls 0.3 cfs @ 1.46 fps)

#### Summary for Pond CB2:

| Inflow Area = |   | 5,639 sf, | 92.81% Impervious, | Inflow Depth > | 5.67" fo  | or 25-Year event |
|---------------|---|-----------|--------------------|----------------|-----------|------------------|
| Inflow        | = | 0.7 cfs @ | 12.12 hrs, Volume= | 2,663 c        | f         |                  |
| Outflow       | = | 0.7 cfs @ | 12.12 hrs, Volume= | 2,663 c        | f, Atten= | 0%, Lag= 0.0 min |
| Primary       | = | 0.7 cfs @ | 12.12 hrs, Volume= | 2,663 c        | f         |                  |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.85' @ 12.13 hrs Flood Elev= 292.30'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 288.20' | <b>12.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 288.20' / 288.10' S= 0.0200 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
|        |         |         |  |

Primary OutFlow Max=0.7 cfs @ 12.12 hrs HW=288.82' TW=288.68' (Dynamic Tailwater) -1=Culvert (Inlet Controls 0.7 cfs @ 1.42 fps)

#### Summary for Pond DCB3:

| Inflow Area = |   | 115,523 sf, | 8.76% Impervious,  | Inflow Depth > | 3.20"    | for 25-Year event   |
|---------------|---|-------------|--------------------|----------------|----------|---------------------|
| Inflow        | = | 9.2 cfs @   | 12.14 hrs, Volume= | 30,837 c       | f        |                     |
| Outflow       | = | 9.2 cfs @   | 12.14 hrs, Volume= | 30,837 c       | f, Atter | n= 0%, Lag= 0.0 min |
| Primary       | = | 9.2 cfs @   | 12.14 hrs, Volume= | 30,837 c       | f        |                     |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 289.32' @ 12.14 hrs Surf.Area= 1 sf Storage= 2 cf Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= 0.0 min calculated for 30,811 cf (100% of inflow) Center-of-Mass det. time= 0.0 min (851.7 - 851.7)

| Volume           | Inv     | ert Avai             | I.Storage                                 | Storage Description  | on  |  |              |
|------------------|---------|----------------------|---|--|---|--|--------------|
| #1               | 287.0   | 00'                  | 310 cf                                    | Custom Stage D   | <b>ata (Irregular)</b> List                                 | ted below (Recalc)   |              |
| Elevatio<br>(fee | n<br>t) | Surf.Area<br>(sq-ft) | Perim.<br>(feet)                          | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)                                   | Wet.Area<br>(sq-ft)  |              |
| 287.0            | 0       | 1                    | 1.0                                       | 0  | 0   | 1  |              |
| 288.0            | 0       | 1                    | 1.0                                       | 1  | 1   | 2  |              |
| 289.0            | 0       | 1                    | 1.0                                       | 1  | 2   | 3  |              |
| 290.0            | 0       | 1                    | 1.0                                       | 1  | 3   | 4  |              |
| 291.0            | 0       | 89                   | 87.5                                      | 33   | 36  | 615  |              |
| 292.0            | 0       | 519                  | 180.8                                     | 274  | 310   | 2,611  |              |
| Device           | Routing | In                   | vert Outle                                | et Devices   |   |  |              |
| #1               | Primary | 287                  | .34' <b>24.0</b><br>L= 1<br>Inlet<br>n= 0 | <b>" Round Culvert</b><br>2.0' CPP, projecti<br>/ Outlet Invert= 28<br>.013 Corrugated F | ng, no headwall,<br>7.34' / 287.10' S<br>PE, smooth interio | Ke= 0.900<br>= 0.0200 '/'    Cc= 0.<br>r,  Flow Area= 3.14 | .900<br>• sf |

Primary OutFlow Max=9.2 cfs @ 12.14 hrs HW=289.32' TW=288.72' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 9.2 cfs @ 2.93 fps)

#### Summary for Pond DCB4:

| Inflow Area | a = | 54,522 sf, | 14.68% Impervious, | Inflow Depth > 3.4 | 40" for 25-Year event   |
|-------------|-----|------------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 4.5 cfs @  | 12.15 hrs, Volume= | 15,439 cf          |                         |
| Outflow     | =   | 4.5 cfs @  | 12.15 hrs, Volume= | 15,439 cf,         | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 4.5 cfs @  | 12.15 hrs, Volume= | 15,439 cf          | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.79' @ 12.15 hrs Surf.Area= 1 sf Storage= 2 cf Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= 0.0 min calculated for 15,439 cf (100% of inflow) Center-of-Mass det. time= 0.0 min (846.2 - 846.2)

| Volume              | Invert    | Avail           | .Storage         | Storage Description       | )                         |                             |
|---------------------|-----------|-----------------|------------------|---------------------------|---------------------------|-----------------------------|
| #1                  | 287.00'   |                 | 250 cf           | Custom Stage Dat          | a (Irregular)Listed       | d below (Recalc)            |
| Elevation<br>(feet) | Surf<br>( | .Area<br>sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
| 287.00              |           | 1               | 1.0              | 0                         | 0                         | 1                           |
| 288.00              |           | 1               | 1.0              | 1                         | 1                         | 2                           |
| 289.00              |           | 1               | 1.0              | 1                         | 2                         | 3                           |
| 290.00              |           | 1               | 1.0              | 1                         | 3                         | 4                           |
| 291.00              |           | 714             | 132.0            | 247                       | 250                       | 1,392                       |

| #1 Drimony 207 25' <b>15 0" Dound Culvert</b>   |   |
|---|---|
| L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf | ) |

**Primary OutFlow** Max=4.4 cfs @ 12.15 hrs HW=288.78' TW=287.11' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 4.4 cfs @ 3.62 fps)

#### Summary for Pond DCB5:

| Inflow Area | ı = | 66,880 sf, | 3.55% Impervious,  | Inflow Depth > 3 | .10" for 25-Year event  |
|-------------|-----|------------|--------------------|------------------|-------------------------|
| Inflow      | =   | 4.5 cfs @  | 12.18 hrs, Volume= | 17,292 cf        |                         |
| Outflow     | =   | 4.5 cfs @  | 12.18 hrs, Volume= | 17,292 cf,       | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 4.5 cfs @  | 12.18 hrs, Volume= | 17,292 cf        | ·                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.30' @ 12.23 hrs Flood Elev= 302.50'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.42' | 21.0" Round Culvert  |
|        | -       |         | L= 47.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |         |         | Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf      |

Primary OutFlow Max=1.3 cfs @ 12.18 hrs HW=299.96' TW=299.94' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 1.3 cfs @ 0.54 fps)

#### Summary for Pond DCB6:

| Inflow Are | ea = | 12,347 sf, | 50.11% Impervious, | Inflow Depth > 4.43 | 3" for 25-Year event    |
|------------|------|------------|--------------------|---------------------|-------------------------|
| Inflow     | =    | 1.4 cfs @  | 12.12 hrs, Volume= | 4,560 cf            |                         |
| Outflow    | =    | 1.4 cfs @  | 12.12 hrs, Volume= | 4,560 cf, A         | Atten= 0%, Lag= 0.0 min |
| Primary    | =    | 1.4 cfs @  | 12.12 hrs, Volume= | 4,560 cf            | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.14' @ 12.24 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>21.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=299.07' TW=299.25' (Dynamic Tailwater) -1=Culvert (Controls 0.0 cfs) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D 25-Year Rainfall=6.03"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 91

#### Summary for Pond DCB7:

| Inflow Are | ea = | 55,060 sf, | 1.60% Impervious,  | Inflow Depth > 2. | 91" for 25-Year event   |
|------------|------|------------|--------------------|-------------------|-------------------------|
| Inflow     | =    | 3.5 cfs @  | 12.18 hrs, Volume= | 13,364 cf         |                         |
| Outflow    | =    | 3.5 cfs @  | 12.18 hrs, Volume= | 13,364 cf,        | Atten= 0%, Lag= 0.0 min |
| Primary    | =    | 3.5 cfs @  | 12.18 hrs, Volume= | 13,364 cf         | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.30' @ 12.22 hrs Flood Elev= 302.70'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>18.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |

Primary OutFlow Max=3.5 cfs @ 12.18 hrs HW=300.10' TW=299.83' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 3.5 cfs @ 1.97 fps)

#### Summary for Pond DMH1:

| Inflow Are | ea = | 123,370 sf, | 14.24% Impervious, | Inflow Depth > | 3.36"   | for 25-Year event   |
|------------|------|-------------|--------------------|----------------|---------|---------------------|
| Inflow     | =    | 10.2 cfs @  | 12.14 hrs, Volume= | 34,565 c       | of      |                     |
| Outflow    | =    | 10.2 cfs @  | 12.14 hrs, Volume= | 34,565 c       | f, Atte | n= 0%, Lag= 0.0 min |
| Primary    | =    | 10.2 cfs @  | 12.14 hrs, Volume= | 34,565 c       | of      | -                   |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.73' @ 12.14 hrs Flood Elev= 292.00'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.00' | <b>24.0" Round Culvert</b><br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

Primary OutFlow Max=10.1 cfs @ 12.14 hrs HW=288.72' TW=287.01' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 10.1 cfs @ 3.52 fps)

#### **Summary for Pond DMH2:**

| Inflow Area | a = | 79,226 sf, | 10.81% Impervious, | Inflow Depth > | 3.31"    | for 25-Year event  |
|-------------|-----|------------|--------------------|----------------|----------|--------------------|
| Inflow      | =   | 5.5 cfs @  | 12.16 hrs, Volume= | 21,852 c       | of       |                    |
| Outflow     | =   | 5.5 cfs @  | 12.16 hrs, Volume= | 21,852 c       | f, Atten | = 0%, Lag= 0.0 min |
| Primary     | =   | 5.5 cfs @  | 12.16 hrs, Volume= | 21,852 c       | of       |                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

\_

Peak Elev= 300.14' @ 12.22 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 296.85' | <b>30.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf |

Primary OutFlow Max=5.5 cfs @ 12.16 hrs HW=299.69' TW=299.60' (Dynamic Tailwater) ☐ 1=Culvert (Inlet Controls 5.5 cfs @ 1.11 fps)

#### Summary for Pond IC-1:

| Inflow Area | a = | 177,892 sf, | 14.37% Impervious, | Inflow Depth > 3 | 3.37" for 25-Year event  |
|-------------|-----|-------------|--------------------|------------------|--------------------------|
| Inflow      | =   | 14.6 cfs @  | 12.14 hrs, Volume= | 50,003 cf        |                          |
| Outflow     | =   | 12.7 cfs @  | 12.18 hrs, Volume= | 45,469 cf,       | Atten= 13%, Lag= 2.4 min |
| Discarded   | =   | 0.1 cfs @   | 9.74 hrs, Volume=  | 7,831 cf         |                          |
| Primary     | =   | 12.6 cfs @  | 12.18 hrs, Volume= | 37,638 cf        |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 287.27' @ 12.18 hrs Surf.Area= 2,271 sf Storage= 7,020 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 20.6 min (863.1 - 842.5)

| Volume | Invert  | Avail.Storage | Storage Description   |
|--------|---------|---------------|---|
| #1     | 282.40' | 3,658 cf      | IC-1 Stone bed (Irregular)Listed below (Recalc)                 |
|        |         |               | 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids  |
| #2     | 283.40' | 5,002 cf      | ADS_StormTech MC-4500 b +Cap x 44 Inside #1                     |
|        |         |               | Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf |
|        |         |               | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap      |
|        |         |               | 44 Chambers in 4 Rows   |
|        |         |               | Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf                   |
| #3     | 283.00' | 200 cf        | PES-1 Stone bed (Pyramidal)Listed below (Recalc)                |
|        |         |               | 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids         |
| #4     | 283.00' | 126 cf        | 24.0" Round Pipe Storage Inside #3                              |
|        |         |               | L= 40.0'  |

| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|------------------|---------------------------|---------------------------|-----------------------------|
| 282.40              | 2,021                | 188.0            | 0                         | 0                         | 2,021                       |
| 283.00              | 2,021                | 188.0            | 1,213                     | 1,213                     | 2,134                       |
| 284.00              | 2,021                | 188.0            | 2,021                     | 3,234                     | 2,322                       |
| 285.00              | 2,021                | 188.0            | 2,021                     | 5,255                     | 2,510                       |
| 286.00              | 2,021                | 188.0            | 2,021                     | 7,276                     | 2,698                       |
| 287.00              | 2,021                | 188.0            | 2,021                     | 9,297                     | 2,886                       |
| 288.00              | 2,021                | 188.0            | 2,021                     | 11,318                    | 3,074                       |
| 289.00              | 2,021                | 188.0            | 2,021                     | 13,339                    | 3,262                       |
| 289.40              | 2,021                | 188.0            | 808                       | 14,147                    | 3,337                       |

8,985 cf Total Available Storage

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft) |
|---------------------|----------------------|---------------------------|---------------------------|---------------------|
| 283.00              | 250                  | 0                         | 0                         | 250                 |
| 284.00              | 250                  | 250                       | 250                       | 313                 |
| 285.00              | 250                  | 250                       | 500                       | 376                 |
| 285.50              | 250                  | 125                       | 625                       | 408                 |

| Device | Routing   | Invert  | Outlet Devices   |
|--------|-----------|---------|--|
| #1     | Discarded | 282.40' | 2.410 in/hr Exfiltration over Surface area                       |
| #2     | Primary   | 285.50' | 50.0' long x 2.5' breadth Broad-Crested Rectangular Weir         |
|        |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|        |           |         | 2.50 3.00 3.50 4.00  |
|        |           |         | Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74     |
|        |           |         | 2.76 2.89 3.05 3.19 3.32   |
| #3     | Device 2  | 284.10' | 24.0" Round Culvert  |
|        |           |         | L= 70.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |           |         | Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 |
|        |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf      |
| #4     | Device 3  | 284.10' | 20.0" W x 12.0" H Vert. Orifice/Grate C= 0.600                   |
|        |           |         | Limited to weir flow at low heads                                |
| #5     | Device 3  | 287.00' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |

**Discarded OutFlow** Max=0.1 cfs @ 9.74 hrs HW=283.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=12.6 cfs @ 12.18 hrs HW=287.27' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Passes 12.6 cfs of 323.8 cfs potential flow) -3=Culvert (Passes 12.6 cfs of 15.9 cfs potential flow)

4=Orifice/Grate (Orifice Controls 10.7 cfs @ 6.41 fps)

-5=Sharp-Crested Vee/Trap Weir (Weir Controls 1.9 cfs @ 1.71 fps)

## Summary for Pond IC-2:

| Inflow Area | a = | 134,287 sf, | 7.03% Impervious,  | Inflow Depth > 3.1 | 5" for 25-Year event     |
|-------------|-----|-------------|--------------------|--------------------|--------------------------|
| Inflow      | =   | 8.9 cfs @   | 12.17 hrs, Volume= | 35,217 cf          |                          |
| Outflow     | =   | 7.8 cfs @   | 12.23 hrs, Volume= | 33,240 cf, /       | Atten= 13%, Lag= 3.6 min |
| Discarded   | =   | 0.1 cfs @   | 9.32 hrs, Volume=  | 4,932 cf           |                          |
| Primary     | =   | 7.7 cfs @   | 12.23 hrs, Volume= | 28,308 cf          |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.08' @ 12.23 hrs Surf.Area= 1,497 sf Storage= 3,920 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 14.3 min (867.8 - 853.5)

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| Volume    | Invert   | Avail.St | orage  | Storage D   | Descriptio                                      | on                     |              |                        |                       |
|-----------|----------|----------|--------|---|---|------------------------|--------------|------------------------|-----------------------|
| #1        | 295.80'  | 2,2      | 234 cf | <b>IC-2 Ston</b><br>8,729 cf (  | IC-2 Stone bed (Irregular)Listed below (Recalc) |                        |              |                        |                       |
| #2        | 296.80'  | 3,7      | 143 cf | <b>ADS_StormTech MC-4500 b +Cap @ 4.03' L</b> x 28 Inside #1<br>Effective Size= $90.4$ "W x $60.0$ "H => $26.46$ sf x $4.03$ 'L = $106.6$ cf<br>Overall Size= $100.0$ "W x $60.0$ "H x $4.33$ 'L with $0.31$ ' Overlap<br>28 Chambers in 2 Rows |   |                        |              |                        |                       |
| #3        | 296.00'  |          | 172 cf | <b>PES-2 St</b> 500 cf Ov   | one bed<br>erall - 71                           | ( <b>Pyra</b><br>cf Em | midal)Listed | below (R<br>29 cf x 40 | lecalc)<br>).0% Voids |
| #4        | 296.00'  |          | 71 cf  | <b>18.0" Ro</b><br>L= 40.0'   | und Pip   | e Stor                 | age Inside # | 3                      |                       |
|           |          | 5,6      | 620 cf | Total Ava   | ilable Sto                                      | orage                  |              |                        |                       |
| Elevation | Su       | rf.Area  | Perim. | Inc   | .Store  | C                      | um.Store     | We                     | t.Area                |
| (feet)    |          | (sq-ft)  | (feet) | (cubi   | c-feet)   | (c                     | ubic-feet)   |                        | (sq-ft)               |
| 295.80    |          | 1,247    | 165.0  |   | 0   |                        | 0            |                        | 1,247                 |
| 296.00    |          | 1,247    | 165.0  |   | 249   |                        | 249          |                        | 1,280                 |
| 297.00    |          | 1,247    | 165.0  |   | 1,247   |                        | 1,496        |                        | 1,445                 |
| 298.00    |          | 1,247    | 165.0  |   | 1,247   |                        | 2,743        |                        | 1,610                 |
| 299.00    |          | 1,247    | 165.0  |   | 1,247   |                        | 3,990        |                        | 1,775                 |
| 300.00    |          | 1,247    | 165.0  |   | 1,247   |                        | 5,237        |                        | 1,940                 |
| 301.00    |          | 1,247    | 165.0  |   | 1,247   |                        | 6,484        |                        | 2,105                 |
| 302.00    |          | 1,247    | 165.0  |   | 1,247   |                        | 7,731        |                        | 2,270                 |
| 302.80    |          | 1,247    | 165.0  |   | 998   |                        | 8,729        |                        | 2,402                 |
| Elevation | Su       | rf.Area  | Inc    | .Store  | Cum.  | Store                  | Wet.A        | Area                   |                       |
| (feet)    |          | (sq-ft)  | (cubi  | c-feet)   | (cubic∙   | -feet)                 | (s           | q-ft)                  |                       |
| 296.00    |          | 250      |        | 0   | •   | 0                      | •            | 250                    |                       |
| 297.00    |          | 250      |        | 250   |   | 250                    |              | 313                    |                       |
| 298.00    |          | 250      |        | 250   |   | 500                    |              | 376                    |                       |
| Device R  | outing   | Invert   | Outle  | et Devices  |   |                        |              |                        |                       |
| #1 D      | iscarded | 295.80   | 2.41   | 0 in/hr Exf   | iltration                                       | over                   | Surface area | 1                      |                       |

| #1 | Discarded | 295.80' | 2.410 in/hr Exfiltration over Surface area                       |
|----|-----------|---------|--|
| #2 | Primary   | 298.00' | 50.0' long x 2.0' breadth Broad-Crested Rectangular Weir         |
|    |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|    |           |         | 2.50 3.00 3.50   |
|    |           |         | Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88     |
|    |           |         | 2.85 3.07 3.20 3.32  |
| #3 | Device 2  | 296.50' | 18.0" Round Culvert  |
|    |           |         | L= 20.0' CPP, projecting, no headwall, Ke= 0.900                 |
|    |           |         | Inlet / Outlet Invert= 296.50' / 296.00' S= 0.0250 '/' Cc= 0.900 |
|    |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf      |
| #4 | Device 3  | 296.50' | 23.0" W x 6.0" H Vert. Orifice/Grate C= 0.600                    |
|    |           |         | Limited to weir flow at low heads                                |
| #5 | Device 3  | 299.90' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |
|    |           |         |  |

**Discarded OutFlow** Max=0.1 cfs @ 9.32 hrs HW=296.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=7.6 cfs @ 12.23 hrs HW=300.07' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Passes 7.6 cfs of 430.5 cfs potential flow) 3=Culvert (Passes 7.6 cfs of 9.7 cfs potential flow) 4=Orifice/Grate (Orifice Controls 6.6 cfs @ 6.93 fps) 5=Sharp-Crested Vee/Trap Weir (Weir Controls 1.0 cfs @ 1.37 fps)

## Summary for Pond SD-1:

| Inflow Area | ı = | 3,729 sf, | 47.63% Im  | pervious, | Inflow Depth > | 4.3   | 3" for 25  | 5-Year event |
|-------------|-----|-----------|------------|-----------|----------------|-------|------------|--------------|
| Inflow      | =   | 0.4 cfs @ | 12.12 hrs, | Volume=   | 1,344          | cf    |            |              |
| Outflow     | =   | 0.4 cfs @ | 12.12 hrs, | Volume=   | 1,305          | cf, A | Atten= 0%, | Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 8.24 hrs,  | Volume=   | 391            | cf    |            |              |
| Primary     | =   | 0.4 cfs @ | 12.12 hrs, | Volume=   | 913            | cf    |            |              |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.92' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= 24.4 min calculated for 1,304 cf (97% of inflow) Center-of-Mass det. time= 7.0 min (821.1 - 814.1)

| Volume           | Invert               | Avail.St           | orage  | Storage Descriptio   | n   |   |
|------------------|----------------------|--------------------|--|--|---|---|
| #1               | 300.00'              |                    | 44 cf  | Custom Stage Da<br>109 cf Overall x 40   | <b>ta (Irregular)</b> Liste<br>0.0% Voids   | d below (Recalc)  |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft <u>)</u>   |
| 300.0<br>301.0   | )0<br>)0             | 109<br>109         | 113.3<br>113.3   | 0<br>109   | 0<br>109  | 109<br>222  |
| Device           | Routing              | Invert             | Outle  | et Devices   |   |   |
| #1<br>#2         | Discarded<br>Primary | 300.00'<br>300.90' | <b>2.41</b><br><b>55.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40 (<br>3.00 3.50 4.00 4<br>f. (English) 2.38 2.5<br>2.72 2.73 2.76 2 | over Surface are     th Broad-Crested     0.60   0.80   1.00   1     .50   5.00   5.50     54   2.69   2.68   2.6     .79   2.88   3.07   3.3 | a<br>Rectangular Weir<br>.20 1.40 1.60 1.80 2.00<br>7 2.67 2.65 2.66 2.66<br>32 |

**Discarded OutFlow** Max=0.0 cfs @ 8.24 hrs HW=300.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=300.92' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 0.4 cfs @ 0.35 fps) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D 25-Year Rainfall=6.03"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 96

## Summary for Pond SD-2:

| Inflow Area | a = | 4,504 sf, | 4.43% Impervious,  | Inflow Depth > 3.2 | 1" for 25-Year event    |
|-------------|-----|-----------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 0.4 cfs @ | 12.12 hrs, Volume= | 1,203 cf           |                         |
| Outflow     | =   | 0.4 cfs @ | 12.12 hrs, Volume= | 1,189 cf, A        | Atten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 8.40 hrs, Volume=  | 133 cf             | -                       |
| Primary     | =   | 0.4 cfs @ | 12.12 hrs, Volume= | 1,056 cf           |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 303.44' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= 10.5 min calculated for 1,189 cf (99% of inflow) Center-of-Mass det. time= 3.5 min (854.0 - 850.5)

| Volume           | Invert                        | Avail.Sto            | rage   | Storage Description   |   |   |  |  |  |  |
|------------------|-------------------------------|----------------------|--|---|---|---|--|--|--|--|
| #1               | 302.50'                       |                      | 16 cf  | 6 cf <b>Custom Stage Data (Irregular)</b> Listed below (Recalc)<br>40 cf Overall x 40.0% Voids  |   |   |  |  |  |  |
| Elevatio<br>(fee | on Su<br>et)                  | rf.Area P<br>(sq-ft) | Perim.<br>(feet)                             | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)   |  |  |  |  |
| 302.9<br>303.9   | 302.50 40 44.   303.50 40 44. |                      | 44.0<br>44.0                                 | 0<br>40   | 0<br>40   | 40<br>84  |  |  |  |  |
| Device           | Routing                       | Invert               | Outle  | et Devices  |   |   |  |  |  |  |
| #1<br>#2         | Discarded<br>Primary          | 302.50'<br>303.40'   | 2.41<br>20.0<br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration of</b><br><b>long x 4.0' breadt</b><br>d (feet) 0.20 0.40 0<br>3.00 3.50 4.00 4.5<br>(English) 2.38 2.5<br>2.72 2.73 2.76 2.5 | Surface area     Broad-Crested I     0.60   0.80   1.00   1.2     50   5.00   5.50     4   2.69   2.68   2.67     79   2.88   3.07   3.32 | <b>Rectangular Weir</b><br>20 1.40 1.60 1.80 2.00<br>2.67 2.65 2.66 2.66<br>2 |  |  |  |  |

**Discarded OutFlow** Max=0.0 cfs @ 8.40 hrs HW=302.51' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=303.44' TW=0.00' (Dynamic Tailwater) ←2=Broad-Crested Rectangular Weir (Weir Controls 0.4 cfs @ 0.48 fps)

#### Summary for Link AP1:

| Inflow A | Area | ı = | 224,752 sf, | 11.85% Impervious | , Inflow Depth > | 2.63   | for 25-Year event      |
|----------|------|-----|-------------|-------------------|------------------|--------|------------------------|
| Inflow   |      | =   | 15.5 cfs @  | 12.17 hrs, Volume | = 49,176         | cf     |                        |
| Primary  | /    | =   | 15.5 cfs @  | 12.17 hrs, Volume | = 49,176         | cf, At | tten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

## Summary for Link AP2:

| Inflow A | Area | = | 42,170 sf, | 25.53% Impe  | ervious, | Inflow Depth > | 3.1    | 8" for 25  | -Year event  |
|----------|------|---|------------|--------------|----------|----------------|--------|------------|--------------|
| Inflow   |      | = | 3.5 cfs @  | 12.13 hrs, V | /olume=  | 11,176         | i cf   |            |              |
| Primary  | у    | = | 3.5 cfs @  | 12.13 hrs, V | /olume=  | 11,176         | icf, A | Atten= 0%, | Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### **Summary for Link AP3:**

| Inflow Ar | rea = | 196,746 sf, | 5.32% Impervious,  | Inflow Depth > 2.0 | 65" for 25-Year event   |
|-----------|-------|-------------|--------------------|--------------------|-------------------------|
| Inflow    | =     | 11.3 cfs @  | 12.22 hrs, Volume= | 43,464 cf          |                         |
| Primary   | =     | 11.3 cfs @  | 12.22 hrs, Volume= | 43,464 cf,         | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### Summary for Link AP4:

| Inflow Ar | rea = | 14,618 sf, | 41.41% Impervious, | Inflow Depth > | 3.93"    | for 25-Year event   |
|-----------|-------|------------|--------------------|----------------|----------|---------------------|
| Inflow    | =     | 1.1 cfs @  | 12.15 hrs, Volume= | 4,783 c        | f        |                     |
| Primary   | =     | 1.1 cfs @  | 12.15 hrs, Volume= | 4,783 c        | f, Atten | n= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 98

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

| SubcatchmentSC1.1:  | Runoff Area=54,522 sf 14.68% Impervious Runoff Depth>5.71"<br>Flow Length=549' Tc=7.5 min CN=76 Runoff=7.4 cfs 25,957 cf             |
|---------------------|--|
| Subcatchment SC1.2: | Runoff Area=115,523 sf 8.76% Impervious Runoff Depth>5.47"<br>Flow Length=510' Tc=6.7 min CN=74 Runoff=15.5 cfs 52,689 cf            |
| SubcatchmentSC1.3:  | Runoff Area=5,639 sf 92.81% Impervious Runoff Depth>8.25"<br>Tc=5.0 min CN=97 Runoff=1.0 cfs 3,877 cf                                |
| SubcatchmentSC1.4:  | Runoff Area=2,208 sf 100.00% Impervious Runoff Depth>8.37"<br>Tc=5.0 min CN=98 Runoff=0.4 cfs 1,540 cf                               |
| SubcatchmentSC1.5:  | Runoff Area=46,238 sf 0.95% Impervious Runoff Depth>5.11"<br>Flow Length=337' Tc=6.4 min CN=71 Runoff=5.9 cfs 19,698 cf              |
| SubcatchmentSC1.6:  | Runoff Area=622 sf 100.00% Impervious Runoff Depth>8.37"<br>Tc=5.0 min CN=98 Runoff=0.1 cfs 434 cf                                   |
| SubcatchmentSC2.1:  | Runoff Area=3,729 sf 47.63% Impervious Runoff Depth>6.80"<br>Flow Length=68' Tc=5.0 min CN=85 Runoff=0.6 cfs 2,115 cf                |
| SubcatchmentSC2.2:  | Runoff Area=38,441 sf 23.39% Impervious Runoff Depth>5.47"<br>Flow Length=140' Tc=6.4 min UI Adjusted CN=74 Runoff=5.2 cfs 17,534 cf |
| SubcatchmentSC3.1:  | Runoff Area=66,880 sf 3.55% Impervious Runoff Depth>5.35"<br>Flow Length=564' Tc=10.4 min CN=73 Runoff=7.6 cfs 29,796 cf             |
| SubcatchmentSC3.2:  | Runoff Area=55,060 sf 1.60% Impervious Runoff Depth>5.11"<br>Flow Length=378' Tc=10.1 min CN=71 Runoff=6.1 cfs 23,428 cf             |
| SubcatchmentSC3.3:  | Runoff Area=62,459 sf 1.63% Impervious Runoff Depth>5.10"<br>Flow Length=287' Tc=10.8 min CN=71 Runoff=6.8 cfs 26,570 cf             |
| SubcatchmentSC3.4:  | Runoff Area=12,347 sf 50.11% Impervious Runoff Depth>6.93"<br>Flow Length=246' Tc=5.0 min CN=86 Runoff=2.1 cfs 7,125 cf              |
| SubcatchmentSC4.1:  | Runoff Area=4,504 sf 4.43% Impervious Runoff Depth>5.48"<br>Flow Length=64' Tc=5.0 min CN=74 Runoff=0.6 cfs 2,055 cf                 |
| SubcatchmentSC4.2:  | Runoff Area=10,114 sf 57.88% Impervious Runoff Depth>6.91"<br>Flow Length=75' Tc=12.7 min CN=86 Runoff=1.3 cfs 5,825 cf              |
| Pond CB1:           | Peak Elev=298.36' Inflow=0.4 cfs 1,540 cf<br>12.0" Round Culvert n=0.013 L=220.0' S=0.0450 '/' Outflow=0.4 cfs 1,540 cf              |
| Pond CB2:           | Peak Elev=290.16' Inflow=1.0 cfs 3,877 cf<br>12.0" Round Culvert n=0.013 L=5.0' S=0.0200 '/' Outflow=1.0 cfs 3,877 cf                |

| <b>Post-Dev Rev 2</b><br>Prepared by Goldsmith, | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA<br>NRCC 24-hr D 100-Year Rainfall=8.62"<br>Prest & Ringwall, Inc.<br>Printed 7/14/2020<br>Printed 7/14/2020 |
|---|---|
| Bond DCB2:                                      | Peak Elev=201.63' Storage=150 cfInflow=15.5 cfs. 52.680 cf  |
| Polia DCB3.                                     | 24.0" Round Culvert n=0.013 L=12.0' S=0.0200 '/' Outflow=15.1 cfs 52,689 cf   |
| Pond DCB4:                                      | Peak Elev=290.64' Storage=71 cf Inflow=7.4 cfs 25,957 cf<br>15.0" Round Culvert n=0.013 L=10.0' S=0.0100 '/' Outflow=7.0 cfs 25,957 cf                      |
| Pond DCB5:                                      | Peak Elev=302.48' Inflow=7.6 cfs 29,796 cf<br>21.0" Round Culvert n=0.013 L=47.0' S=0.0100 '/' Outflow=7.6 cfs 29,796 cf                                    |
| Pond DCB6:                                      | Peak Elev=301.98' Inflow=2.1 cfs 7,125 cf<br>21.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=2.1 cfs 7,125 cf                                       |
| Pond DCB7:                                      | Peak Elev=302.51' Inflow=6.1 cfs 23,428 cf<br>18.0" Round Culvert n=0.013 L=6.0' S=0.0100 '/' Outflow=6.1 cfs 23,428 cf                                     |
| Pond DMH1:                                      | Peak Elev=290.31' Inflow=16.3 cfs 58,106 cf<br>24.0" Round Culvert n=0.013 L=60.0' S=0.0100 '/' Outflow=16.3 cfs 58,106 cf                                  |
| Pond DMH2:                                      | Peak Elev=302.00' Inflow=9.2 cfs 36,922 cf<br>30.0" Round Culvert n=0.013 L=5.0' S=0.0100 '/' Outflow=9.2 cfs 36,922 cf                                     |
| Pond IC-1:                                      | Peak Elev=288.60' Storage=8,338 cf Inflow=23.2 cfs 84,063 cf<br>Discarded=0.1 cfs 8,667 cf Primary=21.0 cfs 70,851 cf Outflow=21.2 cfs 79,518 cf            |
| Pond IC-2:                                      | Peak Elev=301.82' Storage=5,132 cf Inflow=15.2 cfs 60,350 cf<br>Discarded=0.1 cfs 5,490 cf Primary=13.1 cfs 52,878 cf Outflow=13.2 cfs 58,368 cf            |
| Pond SD-1:                                      | Peak Elev=300.93' Storage=40 cf Inflow=0.6 cfs 2,115 cf<br>Discarded=0.0 cfs 431 cf Primary=0.6 cfs 1,644 cf Outflow=0.6 cfs 2,075 cf                       |
| Pond SD-2:                                      | Peak Elev=303.46' Storage=15 cf Inflow=0.6 cfs 2,055 cf<br>Discarded=0.0 cfs 147 cf Primary=0.6 cfs 1,894 cf Outflow=0.6 cfs 2,041 cf                       |
| Link AP1:                                       | Inflow=26.1 cfs  90,983 cf<br>Primary=26.1 cfs  90,983 cf   |
| Link AP2:                                       | Inflow=5.8 cfs 19,178 cf<br>Primary=5.8 cfs 19,178 cf   |
| Link AP3:                                       | Inflow=19.6 cfs 79,448 cf<br>Primary=19.6 cfs 79,448 cf   |
| Link AP4:                                       | Inflow=1.8 cfs 7,719 cf<br>Primary=1.8 cfs 7,719 cf   |

Total Runoff Area = 478,286 sf Runoff Volume = 218,645 cf Average Runoff Depth = 5.49" 88.73% Pervious = 424,371 sf 11.27% Impervious = 53,915 sf Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 100

#### Summary for Subcatchment SC1.1:

Runoff = 7.4 cfs @ 12.15 hrs, Volume= 25,957 cf, Depth> 5.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| A     | rea (sf) | CN      | Description |              |                                    |
|-------|----------|---------|-------------|--------------|------------------------------------|
|       | 24,785   | 74 :    | >75% Gras   | s cover, Go  | ood, HSG C                         |
|       | 21,721   | 70      | Woods, Go   | od, HSG C    |                                    |
|       | 14       | 89      | Gravel road | ls, HSG C    |                                    |
|       | 6,226    | 98      | Paved park  | ing, HSG C   |                                    |
|       | 1,776    | 98      | Roofs, HSC  | S Č          |                                    |
|       | 54,522   | 76      | Weighted A  | verage       |                                    |
|       | 46,520   |         | 85.32% Per  | vious Area   |                                    |
|       | 8,002    |         | 14.68% Imp  | pervious Are | ea                                 |
|       |          |         |             |              |                                    |
| Tc    | Length   | Slope   | Velocity    | Capacity     | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                    |
| 0.9   | 50       | 0.0100  | 0.90        |              | Sheet Flow,                        |
|       |          |         |             |              | Smooth surfaces n= 0.011 P2= 3.16" |
| 0.2   | 35       | 0.0200  | 2.87        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Paved Kv= 20.3 fps                 |
| 0.6   | 50       | 0.0345  | 1.30        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 1.5   | 180      | 0.1550  | 1.97        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Woodland Kv= 5.0 fps               |
| 4.3   | 234      | 0.0170  | 0.91        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 7.5   | 549      | Total   |             |              |                                    |

## **Summary for Subcatchment SC1.2:**

| Runoff = | 15.5 cfs @ | 12.14 hrs, | Volume= | 52,689 cf, | Depth> | 5.47" |
|----------|------------|------------|---------|------------|--------|-------|

| Area (sf) | CN | Description                   |
|-----------|----|-------------------------------|
| 46,703    | 74 | >75% Grass cover, Good, HSG C |
| 57,729    | 70 | Woods, Good, HSG C            |
| 967       | 89 | Gravel roads, HSG C           |
| 313       | 98 | Unconnected pavement, HSG C   |
| 7,362     | 98 | Paved parking, HSG C          |
| 2,449     | 98 | Roofs, HSG C                  |
| 115,523   | 74 | Weighted Average              |
| 105,398   |    | 91.24% Pervious Area          |
| 10,124    |    | 8.76% Impervious Area         |
| 313       |    | 3.09% Unconnected             |

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| Тс    | Length | Slope   | Velocity | Capacity | Description                     |
|-------|--------|---------|----------|----------|---------------------------------|
| (min) | (feet) | (ft/ft) | (ft/sec) | (cfs)    | ·                               |
| 3.6   | 50     | 0.0600  | 0.23     |          | Sheet Flow,                     |
|       |        |         |          |          | Grass: Short n= 0.150 P2= 3.16" |
| 1.3   | 167    | 0.0988  | 2.20     |          | Shallow Concentrated Flow,      |
|       |        |         |          |          | Short Grass Pasture Kv= 7.0 fps |
| 0.8   | 117    | 0.1200  | 2.42     |          | Shallow Concentrated Flow,      |
|       |        |         |          |          | Short Grass Pasture Kv= 7.0 fps |
| 1.0   | 176    | 0.0400  | 3.00     |          | Shallow Concentrated Flow,      |
|       |        |         |          |          | Grassed Waterway Kv= 15.0 fps   |
| 6.7   | 510    | Total   |          |          |                                 |

## Summary for Subcatchment SC1.3:

| Runoff | = | 1.0 cfs @ | 12.12 hrs, | Volume= | 3,877 cf, | Depth> | 8.25" |
|--------|---|-----------|------------|---------|-----------|--------|-------|

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| A           | rea (sf)         | CN            | Description               |                        |               |  |  |  |
|-------------|------------------|---------------|---------------------------|------------------------|---------------|--|--|--|
|             | 162              | 74            | >75% Gras                 | s cover, Go            | bod, HSG C    |  |  |  |
|             | 243              | 89            | Gravel road               | ls, HSG C              |               |  |  |  |
|             | 5,233            | 98            | Paved park                | ing, HSG C             |               |  |  |  |
|             | 5,639            | 97            | Weighted A                | verage                 |               |  |  |  |
|             | 405              |               | 7.19% Perv                | rious Area             |               |  |  |  |
|             | 5,233            |               | 92.81% Imp                | 92.81% Impervious Area |               |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slop<br>(ft/f | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs)      | Description   |  |  |  |
| 5.0         |                  |               |                           |                        | Direct Entry, |  |  |  |
|             |                  |               |                           |                        |               |  |  |  |

## Summary for Subcatchment SC1.4:

Runoff = 0.4 cfs @ 12.12 hrs, Volume= 1,540 cf, Depth> 8.37"

| Α           | rea (sf)         | CN               | Description             |                   |               |  |  |  |
|-------------|------------------|------------------|-------------------------|-------------------|---------------|--|--|--|
|             | 2,208            | 98               | 98 Paved parking, HSG C |                   |               |  |  |  |
|             | 2,208            |                  | 100.00% Impervious Area |                   |               |  |  |  |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec)    | Capacity<br>(cfs) | Description   |  |  |  |
| 5.0         |                  |                  |                         |                   | Direct Entry, |  |  |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 100-Year Rainfall=8.62"            |
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#### Summary for Subcatchment SC1.5:

Runoff = 5.9 cfs @ 12.14 hrs, Volume= 19,698 cf, Depth> 5.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| Ar          | rea (sf)         | CN [             | Description          |                   |   |
|-------------|------------------|------------------|----------------------|-------------------|---|
|             | 37,139           | 70 \             | Noods, Go            | od, HSG C         |   |
|             | 441              | 98 l             | Jnconnecte           | ed pavemer        | nt, HSG C   |
|             | 8,658            | 74 >             | >75% Gras            | s cover, Go       | bod, HSG C  |
| 4           | 46,238           | 71 \             | Neighted A           | verage            |   |
| 4           | 45,797           | ę                | 99.05% Pei           | vious Area        |   |
|             | 441              | (                | ).95% Impe           | ervious Are       | а   |
|             | 441              |                  | 100.00% Ui           | nconnected        | 1   |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
| 3.3         | 50               | 0.0800           | 0.26                 |                   | Sheet Flow.   |
| 3.1         | 287              | 0.0941           | 1.53                 |                   | Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Woodland Kv= 5.0 fps |
| 6.4         | 337              | Total            |                      |                   |   |

#### Summary for Subcatchment SC1.6:

Runoff = 0.1 cfs @ 12.12 hrs, Volume= 434 cf, Depth> 8.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| Area (sf)                 | CN            | CN Description            |                   |               |  |  |  |  |
|---------------------------|---------------|---------------------------|-------------------|---------------|--|--|--|--|
| 622                       | 98            | 98 Paved parking, HSG C   |                   |               |  |  |  |  |
| 622                       |               | 100.00% Impervious Area   |                   |               |  |  |  |  |
| Tc Length<br>(min) (feet) | Slop<br>(ft/f | e Velocity<br>t) (ft/sec) | Capacity<br>(cfs) | Description   |  |  |  |  |
| 5.0                       |               |                           |                   | Direct Entry, |  |  |  |  |

#### **Summary for Subcatchment SC2.1:**

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 2,115 cf, Depth> 6.80"

| A      | rea (sf)                        | CN D        | Description               |             |   |  |  |  |
|--------|---------------------------------|-------------|---------------------------|-------------|---|--|--|--|
|        | 1,953                           | 74 >        | 75% Gras                  | s cover, Go | ood, HSG C  |  |  |  |
|        | 1,776                           | 98 F        | Roofs, HSG                | i C         |   |  |  |  |
|        | 3,729                           | 85 V        | Veighted A                | verage      |   |  |  |  |
|        | 1,953                           | 5           | 2.37% Per                 | vious Area  |   |  |  |  |
|        | 1,776                           | 4           | 7.63% Imp                 | ervious Are | ea  |  |  |  |
|        |                                 |             |                           |             |   |  |  |  |
| Tc     | Length                          | Slope       | Velocity                  | Capacity    | Description                                       |  |  |  |
| (min)  | (feet)                          | (ft/ft)     | (ft/sec)                  | (cfs)       |   |  |  |  |
| 4.3    | 50                              | 0.0400      | 0.19                      |             | Sheet Flow,                                       |  |  |  |
|        | 10                              |             |                           |             | Grass: Short n= 0.150 P2= 3.16"                   |  |  |  |
| 0.2    | 18                              | 0.0300      | 1.21                      |             | Shallow Concentrated Flow,                        |  |  |  |
|        |                                 |             |                           |             | Short Grass Pasture Kv= 7.0 fps                   |  |  |  |
| 4.5    | 68                              | Total, I    | ncreased t                | o minimum   | Tc = 5.0 min                                      |  |  |  |
|        |                                 |             | •                         |             |   |  |  |  |
|        | Summary for Subcatchment SC2.2: |             |                           |             |   |  |  |  |
|        |                                 |             |                           |             |   |  |  |  |
| Runoff | =                               | 5.2 C       | ts @ 12.1                 | 3 hrs, Volu | ume= $17,534$ cf, Depth> $5.47$ "                 |  |  |  |
| Dunaff |                                 | 2 00 m o th |                           |             | ted CNL Time Share 0.00.04.00 hrs. dt= 0.00 hrs.  |  |  |  |
|        | y 363 11<br>1 br D 10           | K-ZU Meli   | 100, UH=5<br>Painfall-9 ( | CS, weign   | ted-CN, time Span= 0.00-24.00 hrs, $dt= 0.02$ hrs |  |  |  |
| NRUU Z |                                 |             | \all11all=0.0             | )2          |   |  |  |  |
| А      | rea (sf)                        | CN A        | Adi Desc                  | ription     |   |  |  |  |
|        | 7 180                           | 74          | <u>xuj 2000</u><br>>750   | 6 Grass co  | ver Good HSG C                                    |  |  |  |
|        | 22 269                          | 70          | Woo                       | ds Good F   | 4SG C   |  |  |  |
|        | 8 992                           | 98          | Unco                      | nnected pa  | avement HSG C                                     |  |  |  |
|        | 38 441                          | 77          | 74 Weig                   | hted Avera  |   |  |  |  |
|        | 29 449                          |             | 76.6                      | 1% Perviou  | is Area   |  |  |  |
|        | 8.992                           |             | 23.39                     | 9% Impervi  | ous Area  |  |  |  |
|        | 8,992                           |             | 100.0                     | 0% Uncon    | inected   |  |  |  |
|        | 0,002                           |             |                           |             |   |  |  |  |
| Tc     | Length                          | Slope       | Velocity                  | Capacity    | Description                                       |  |  |  |
| (min)  | (feet)                          | (ft/ft)     | (ft/sec)                  | (cfs)       | •   |  |  |  |
| 5.7    | 50                              | 0.0200      | 0.15                      |             | Sheet Flow,                                       |  |  |  |
|        | -                               | -           | -                         |             | Grass: Short n= 0.150 P2= 3.16"                   |  |  |  |
| 0.2    | 29                              | 0.1700      | 2.89                      |             | Shallow Concentrated Flow,                        |  |  |  |
|        |                                 |             |                           |             | Short Grass Pasture Kv= 7.0 fps                   |  |  |  |
| 0.5    | 61                              | 0.1800      | 2.12                      |             | Shallow Concentrated Flow,                        |  |  |  |
|        |                                 |             |                           |             | Woodland Ky= 5.0 fps                              |  |  |  |

140 Total 6.4

#### Summary for Subcatchment SC3.1:

Runoff 7.6 cfs @ 12.18 hrs, Volume= 29,796 cf, Depth> 5.35" =

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| A     | rea (sf) | CN [    | Description |              |                                 |
|-------|----------|---------|-------------|--------------|---------------------------------|
|       | 32,168   | 74 >    | 75% Gras    | s cover, Go  | ood, HSG C                      |
|       | 31,971   | 70 \    | Voods, Go   | od, HSG C    |                                 |
|       | 364      | 89 (    | Gravel road | ls, HSG C    |                                 |
|       | 55       | 98 F    | Paved park  | ing, HSG C   |                                 |
|       | 2,321    | 98 F    | Roofs, HSC  | G C          |                                 |
|       | 66,880   | 73 \    | Veighted A  | verage       |                                 |
|       | 64,504   | ç       | 96.45% Pei  | vious Area   |                                 |
|       | 2,376    | 3       | 3.55% Impe  | ervious Area | а                               |
| _     |          |         |             | _            |                                 |
| Tc    | Length   | Slope   | Velocity    | Capacity     | Description                     |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                 |
| 5.7   | 50       | 0.0200  | 0.15        |              | Sheet Flow,                     |
|       |          |         |             |              | Grass: Short n= 0.150 P2= 3.16" |
| 2.1   | 247      | 0.0800  | 1.98        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps |
| 1.5   | 133      | 0.0830  | 1.44        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Woodland Kv= 5.0 fps            |
| 1.1   | 134      | 0.0820  | 2.00        |              | Shallow Concentrated Flow,      |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps |

10.4 564 Total

## **Summary for Subcatchment SC3.2:**

Runoff = 6.1 cfs @ 12.17 hrs, Volume= 23,428 cf, Depth> 5.11"

| A     | rea (sf) | CN I    | Description |              |  |
|-------|----------|---------|-------------|--------------|--|
|       | 12,832   | 74 :    | >75% Gras   | s cover, Go  | ood, HSG C                                 |
|       | 880      | 98 I    | Roofs, HSG  | ЭC           |  |
|       | 41,349   | 70      | Noods, Go   | od, HSG C    |  |
|       | 55,060   | 71      | Neighted A  | verage       |  |
|       | 54,180   | ę       | 98.40% Pei  | vious Area   |  |
|       | 880      |         | 1.60% Impe  | ervious Area | а  |
| _     |          |         |             |              |  |
| IC    | Length   | Slope   | Velocity    | Capacity     | Description                                |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cts)        |  |
| 7.1   | 50       | 0.0800  | 0.12        |              | Sheet Flow,                                |
|       |          |         |             |              | Woods: Light underbrush n= 0.400 P2= 3.16" |
| 1.7   | 204      | 0.1600  | 2.00        |              | Shallow Concentrated Flow,                 |
|       |          |         |             |              | Woodland Kv= 5.0 fps                       |
| 1.3   | 124      | 0.0530  | 1.61        |              | Shallow Concentrated Flow,                 |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps            |
| 10.1  | 378      | Total   |             |              |  |

|  | Five Paths, Tax Map 39, Parcel 15A, Wayland, MA |
|--|---|
| Post-Dev Rev 2                                     | NRCC 24-hr D 100-Year Rainfall=8.62"            |
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## Summary for Subcatchment SC3.3:

Runoff = 6.8 cfs @ 12.18 hrs, Volume= 26,570 cf, Depth> 5.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| A           | rea (sf)         | CN [             | Description          |                   |   |
|-------------|------------------|------------------|----------------------|-------------------|---|
|             | 12,393           | 74 >             | >75% Gras            | s cover, Go       | ood, HSG C  |
|             | 49,047           | 70 \             | Voods, Go            | od, HSG C         |   |
|             | 1,019            | 98 l             | Jnconnecte           | ed pavemer        | nt, HSG C   |
|             | 62,459           | 71 \             | Veighted A           | verage            |   |
|             | 61,440           | ç                | 98.37% Per           | vious Area        |   |
|             | 1,019            |                  | l.63% Impe           | ervious Area      | а   |
|             | 1,019            | -                | 100.00% Ui           | nconnected        | 1   |
| Tc<br>(min) | Length<br>(feet) | Slope<br>(ft/ft) | Velocity<br>(ft/sec) | Capacity<br>(cfs) | Description   |
| 8.6         | 50               | 0.0500           | 0.10                 |                   | Sheet Flow,   |
| 2.2         | 237              | 0.1350           | 1.84                 |                   | Woods: Light underbrush n= 0.400 P2= 3.16"<br><b>Shallow Concentrated Flow,</b><br>Woodland Kv= 5.0 fps |
| 10.8        | 287              | Total            |                      |                   |   |

## Summary for Subcatchment SC3.4:

Runoff = 2.1 cfs @ 12.12 hrs, Volume= 7,125 cf, Depth> 6.93"

| A     | rea (sf) | CN [    | Description |              |                                    |
|-------|----------|---------|-------------|--------------|------------------------------------|
|       | 5,554    | 74 >    | >75% Gras   | s cover, Go  | bod, HSG C                         |
|       | 529      | 70 \    | Noods, Go   | od, HSG C    |                                    |
|       | 76       | 89 (    | Gravel road | ls, HSG C    |                                    |
|       | 6,187    | 98 F    | Paved park  | ing, HSG C   |                                    |
|       | 12,347   | 86 \    | Veighted A  | verage       |                                    |
|       | 6,159    | 2       | 19.89% Per  | vious Area   |                                    |
|       | 6,187    | 5       | 50.11% Imp  | pervious Are | ea                                 |
|       |          |         |             |              |                                    |
| Тс    | Length   | Slope   | Velocity    | Capacity     | Description                        |
| (min) | (feet)   | (ft/ft) | (ft/sec)    | (cfs)        |                                    |
| 1.3   | 113      | 0.0200  | 1.40        |              | Sheet Flow,                        |
|       |          |         |             |              | Smooth surfaces n= 0.011 P2= 3.16" |
| 2.4   | 38       | 0.1000  | 0.27        |              | Sheet Flow,                        |
|       |          |         |             |              | Grass: Short n= 0.150 P2= 3.16"    |
| 0.9   | 95       | 0.0600  | 1.71        |              | Shallow Concentrated Flow,         |
|       |          |         |             |              | Short Grass Pasture Kv= 7.0 fps    |
| 4.6   | 246      | Total,  | Increased t | o minimum    | Tc = 5.0 min                       |

Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 106

#### Summary for Subcatchment SC4.1:

Runoff = 0.6 cfs @ 12.12 hrs, Volume= 2,055 cf, Depth> 5.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs NRCC 24-hr D 100-Year Rainfall=8.62"

| A          | rea (sf) | CN I                        | Description              |              |   |
|------------|----------|-----------------------------|--------------------------|--------------|---|
|            | 1,020    | 70                          | Noods, Go                | od, HSG C    |   |
|            | 200      | 98 I                        | Jnconnecte               | ed pavemer   | nt, HSG C   |
|            | 3,285    | 74 >                        | >75% Gras                | s cover, Go  | ood, HSG C  |
|            | 4,504    | 74                          | Neighted A               | verage       |   |
|            | 4,305    | ę                           | 95.57% Per               | vious Area   |   |
|            | 200      | 4                           | 1.43% Impe               | ervious Area | а   |
|            | 200      |                             | 100.00% Üi               | nconnected   |   |
|            |          |                             |                          |              |   |
| Tc         | Length   | Slope                       | Velocity                 | Capacity     | Description   |
| (min)      | (feet)   | / 51 / 51 \                 | (6)                      | / <b>-</b> \ |   |
|            |          | (ft/ft)                     | (IT/Sec)                 | (cfs)        |   |
| 3.6        | 50       | (ft/ft)<br>0.0600           | (ft/sec)<br>0.23         | (cts)        | Sheet Flow,   |
| 3.6        | 50       | (ft/ft)<br>0.0600           | <u>(π/sec)</u><br>0.23   | (cts)        | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"  |
| <u> </u>   | 50<br>14 | 0.0600<br>0.0400            | 0.23<br>1.40             | (cts)        | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,                                    |
| 3.6<br>0.2 | 50<br>14 | (ft/ft)<br>0.0600<br>0.0400 | (ft/sec)<br>0.23<br>1.40 | (cts)        | Sheet Flow,<br>Grass: Short n= 0.150 P2= 3.16"<br>Shallow Concentrated Flow,<br>Short Grass Pasture Kv= 7.0 fps |

## **Summary for Subcatchment SC4.2:**

Runoff = 1.3 cfs @ 12.20 hrs, Volume= 5,825 cf, Depth> 6.91"

| A     | rea (sf) | CN [    | Description           |              |  |  |  |  |  |  |
|-------|----------|---------|-----------------------|--------------|--|--|--|--|--|--|
|       | 3,927    | 70 \    | 70 Woods, Good, HSG C |              |  |  |  |  |  |  |
|       | 5,854    | 98 l    | Jnconnecte            | ed pavemer   | nt, HSG C                                  |  |  |  |  |  |
|       | 333      | 74 >    | <u>&gt;75% Gras</u>   | s cover, Go  | ood, HSG C                                 |  |  |  |  |  |
|       | 10,114   | 86 \    | Veighted A            | verage       |  |  |  |  |  |  |
|       | 4,260    | 2       | 2.12% Pe              | vious Area   |  |  |  |  |  |  |
|       | 5,854    | Ę       | 57.88% Imp            | pervious Are | ea   |  |  |  |  |  |
|       | 5,854    |         | 100.00% Ui            | nconnected   | 1  |  |  |  |  |  |
| _     |          |         |                       | _            |  |  |  |  |  |  |
| Tc    | Length   | Slope   | Velocity              | Capacity     | Description                                |  |  |  |  |  |
| (min) | (feet)   | (ft/ft) | (ft/sec)              | (cfs)        |  |  |  |  |  |  |
| 12.4  | 50       | 0.0200  | 0.07                  |              | Sheet Flow,                                |  |  |  |  |  |
|       |          |         |                       |              | Woods: Light underbrush n= 0.400 P2= 3.16" |  |  |  |  |  |
| 0.3   | 25       | 0.0800  | 1.41                  |              | Shallow Concentrated Flow,                 |  |  |  |  |  |
|       |          |         |                       |              | Woodland Kv= 5.0 fps                       |  |  |  |  |  |
| 12.7  | 75       | Total   |                       |              |  |  |  |  |  |  |
|       |          |         |                       |              |  |  |  |  |  |  |

Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 107

## Summary for Pond CB1:

| Inflow Area | a = | 2,208 sf,10  | 0.00% Impervious  | Inflow Depth > | 8.37"    | for 100-Year event  |
|-------------|-----|--------------|-------------------|----------------|----------|---------------------|
| Inflow      | =   | 0.4 cfs @ 12 | 2.12 hrs, Volume= | 1,540          | cf       |                     |
| Outflow     | =   | 0.4 cfs @ 12 | 2.12 hrs, Volume= | 1,540          | cf, Atte | n= 0%, Lag= 0.0 min |
| Primary     | =   | 0.4 cfs @ 12 | 2.12 hrs, Volume= | 1,540          | cf       | -                   |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 298.36' @ 12.12 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 298.00' | <b>12.0" Round Culvert</b><br>L= 220.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 298.00' / 288.10' S= 0.0450 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |

Primary OutFlow Max=0.4 cfs @ 12.12 hrs HW=298.36' TW=289.68' (Dynamic Tailwater) ↓ 1=Culvert (Inlet Controls 0.4 cfs @ 1.61 fps)

#### Summary for Pond CB2:

| Inflow Are | ea = | 5,639 sf, | 92.81% Impervious, | Inflow Depth > 8 | 8.25" fo  | r 100-Year event |
|------------|------|-----------|--------------------|------------------|-----------|------------------|
| Inflow     | =    | 1.0 cfs @ | 12.12 hrs, Volume= | 3,877 cf         | f         |                  |
| Outflow    | =    | 1.0 cfs @ | 12.12 hrs, Volume= | 3,877 cf         | f, Atten= | 0%, Lag= 0.0 min |
| Primary    | =    | 1.0 cfs @ | 12.12 hrs, Volume= | 3,877 cf         | f         |                  |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 290.16' @ 12.14 hrs Flood Elev= 292.30'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 288.20' | <b>12.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf                   |

Primary OutFlow Max=1.6 cfs @ 12.12 hrs HW=289.98' TW=289.68' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 1.6 cfs @ 2.06 fps)

#### Summary for Pond DCB3:

| Inflow Area | a = | 115,523 sf, | 8.76% Impervious,  | Inflow Depth > | 5.47" f   | or 100-Year event  |
|-------------|-----|-------------|--------------------|----------------|-----------|--------------------|
| Inflow      | =   | 15.5 cfs @  | 12.14 hrs, Volume= | 52,689 c       | f         |                    |
| Outflow     | =   | 15.1 cfs @  | 12.16 hrs, Volume= | 52,689 c       | f, Atten= | = 3%, Lag= 1.3 min |
| Primary     | =   | 15.1 cfs @  | 12.16 hrs, Volume= | 52,689 c       | f         |                    |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Peak Elev= 291.63' @ 12.15 hrs Surf.Area= 321 sf Storage= 159 cf Flood Elev= 292.00' Surf.Area= 519 sf Storage= 310 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 0.0 min (832.0 - 832.0)

| Volume           | Inv     | ert Avai             | I.Storage                                 | Storage Description  | on   |   |              |
|------------------|---------|----------------------|---|--|--|---|--------------|
| #1               | 287.0   | 00'                  | 310 cf                                    | Custom Stage Da  | <b>ata (Irregular)</b> Liste                                       | ed below (Recalc)   |              |
| Elevatio<br>(fee | n<br>t) | Surf.Area<br>(sq-ft) | Perim.<br>(feet)                          | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft <u>)</u>                               |              |
| 287.0            | 0       | 1                    | 1.0                                       | 0  | 0  | 1   |              |
| 288.0            | 0       | 1                    | 1.0                                       | 1  | 1  | 2   |              |
| 289.0            | 0       | 1                    | 1.0                                       | 1  | 2  | 3   |              |
| 290.0            | 0       | 1                    | 1.0                                       | 1  | 3  | 4   |              |
| 291.0            | 0       | 89                   | 87.5                                      | 33   | 36   | 615   |              |
| 292.0            | 0       | 519                  | 180.8                                     | 274  | 310  | 2,611   |              |
| Device           | Routing | In                   | vert Outle                                | et Devices   |  |   |              |
| #1               | Primary | 287                  | .34' <b>24.0</b><br>L= 1<br>Inlet<br>n= 0 | <b>" Round Culvert</b><br>2.0' CPP, projecti<br>/ Outlet Invert= 28<br>.013 Corrugated P | ng, no headwall,  l<br>7.34' / 287.10'   S=<br>'E, smooth interior | Ke= 0.900<br>= 0.0200 '/'    Cc= 0<br>;,  Flow Area= 3.14 | .900<br>I sf |

Primary OutFlow Max=13.8 cfs @ 12.16 hrs HW=291.61' TW=290.28' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 13.8 cfs @ 4.39 fps)

#### Summary for Pond DCB4:

| Inflow Area | a = | 54,522 sf, | 14.68% Impervious, | Inflow Depth > 5. | 71" for 100-Year event  |
|-------------|-----|------------|--------------------|-------------------|-------------------------|
| Inflow      | =   | 7.4 cfs @  | 12.15 hrs, Volume= | 25,957 cf         |                         |
| Outflow     | =   | 7.0 cfs @  | 12.13 hrs, Volume= | 25,957 cf,        | Atten= 5%, Lag= 0.0 min |
| Primary     | =   | 7.0 cfs @  | 12.13 hrs, Volume= | 25,957 cf         | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 290.64' @ 12.18 hrs Surf.Area= 302 sf Storage= 71 cf Flood Elev= 290.50' Surf.Area= 192 sf Storage= 37 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 0.0 min (827.1 - 827.0)

| Volume              | Invert    | Avail            | .Storage         | Storage Description       |                             |                     |  |  |
|---------------------|-----------|------------------|------------------|---------------------------|-----------------------------|---------------------|--|--|
| #1                  | 287.00'   |                  | 250 cf           | Custom Stage Dat          | <b>a (Irregular)</b> Listed | below (Recalc)      |  |  |
| Elevation<br>(feet) | Surf<br>( | .Area<br>(sq-ft) | Perim.<br>(feet) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft) |  |  |
| 287.00              |           | 1                | 1.0              | 0                         | 0                           | 1                   |  |  |
| 288.00              |           | 1                | 1.0              | 1                         | 1                           | 2                   |  |  |
| 289.00              |           | 1                | 1.0              | 1                         | 2                           | 3                   |  |  |
| 290.00              |           | 1                | 1.0              | 1                         | 3                           | 4                   |  |  |
| 291.00              |           | 714              | 132.0            | 247                       | 250                         | 1,392               |  |  |

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.25' | 15.0" Round Culvert   |
|        | ·       |         | L= 10.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.25' / 287.15' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf |

**Primary OutFlow** Max=7.0 cfs @ 12.13 hrs HW=290.26' TW=288.01' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 7.0 cfs @ 5.69 fps)

#### Summary for Pond DCB5:

| Inflow Area | = | 66,880 sf, | 3.55% Impervious,  | Inflow Depth > 5. | .35" for 100-Year event |
|-------------|---|------------|--------------------|-------------------|-------------------------|
| Inflow      | = | 7.6 cfs @  | 12.18 hrs, Volume= | 29,796 cf         |                         |
| Outflow     | = | 7.6 cfs @  | 12.18 hrs, Volume= | 29,796 cf,        | Atten= 0%, Lag= 0.0 min |
| Primary     | = | 7.6 cfs @  | 12.18 hrs, Volume= | 29,796 cf         |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 302.48' @ 12.23 hrs Flood Elev= 302.50'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.42' | 21.0" Round Culvert  |
|        | -       |         | L= 47.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |         |         | Inlet / Outlet Invert= 297.42' / 296.95' S= 0.0100 '/' Cc= 0.900 |
|        |         |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf      |

Primary OutFlow Max=5.5 cfs @ 12.18 hrs HW=302.02' TW=301.66' (Dynamic Tailwater) -1=Culvert (Inlet Controls 5.5 cfs @ 2.28 fps)

#### Summary for Pond DCB6:

| Inflow Are | a = | 12,347 sf, | 50.11% Impervious, | Inflow Depth > | 6.93" fo  | r 100-Year event |
|------------|-----|------------|--------------------|----------------|-----------|------------------|
| Inflow     | =   | 2.1 cfs @  | 12.12 hrs, Volume= | 7,125 c        | f         |                  |
| Outflow    | =   | 2.1 cfs @  | 12.12 hrs, Volume= | 7,125 c        | f, Atten= | 0%, Lag= 0.0 min |
| Primary    | =   | 2.1 cfs @  | 12.12 hrs, Volume= | 7,125 c        | f         | -                |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 301.98' @ 12.24 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>21.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 2.41 sf |

Primary OutFlow Max=0.0 cfs @ 12.12 hrs HW=300.49' TW=300.69' (Dynamic Tailwater) -1=Culvert (Controls 0.0 cfs) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 110

## Summary for Pond DCB7:

| Inflow Area | a = | 55,060 sf, | 1.60% Impervious,  | Inflow Depth > 5.1 | 1" for 100-Year event   |
|-------------|-----|------------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 6.1 cfs @  | 12.17 hrs, Volume= | 23,428 cf          |                         |
| Outflow     | =   | 6.1 cfs @  | 12.17 hrs, Volume= | 23,428 cf, A       | Atten= 0%, Lag= 0.0 min |
| Primary     | =   | 6.1 cfs @  | 12.17 hrs, Volume= | 23,428 cf          | -                       |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 302.51' @ 12.21 hrs Flood Elev= 302.70'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 297.01' | <b>18.0" Round Culvert</b><br>L= 6.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 297.01' / 296.95' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf |

Primary OutFlow Max=6.1 cfs @ 12.17 hrs HW=302.20' TW=301.38' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 6.1 cfs @ 3.44 fps)

#### Summary for Pond DMH1:

| Inflow Area | a = | 123,370 sf, | 14.24% Impervious, | Inflow Depth > | 5.65"     | for 100  | -Year event  |
|-------------|-----|-------------|--------------------|----------------|-----------|----------|--------------|
| Inflow      | =   | 16.3 cfs @  | 12.15 hrs, Volume= | 58,106 c       | of        |          |              |
| Outflow     | =   | 16.3 cfs @  | 12.15 hrs, Volume= | 58,106 d       | of, Atter | n= 0%, I | Lag= 0.0 min |
| Primary     | =   | 16.3 cfs @  | 12.15 hrs, Volume= | 58,106 d       | of        |          |              |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 290.31' @ 12.17 hrs Flood Elev= 292.00'

| Device | Routing | Invert  | Outlet Devices  |
|--------|---------|---------|---|
| #1     | Primary | 287.00' | <b>24.0" Round Culvert</b><br>L= 60.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 287.00' / 286.40' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf |

Primary OutFlow Max=16.3 cfs @ 12.15 hrs HW=290.21' TW=288.35' (Dynamic Tailwater) **1=Culvert** (Inlet Controls 16.3 cfs @ 5.19 fps)

#### **Summary for Pond DMH2:**

| Inflow Area | a = | 79,226 sf, | 10.81% Impervious, | Inflow Depth > | 5.59" for   | 100-Year event   |
|-------------|-----|------------|--------------------|----------------|-------------|------------------|
| Inflow      | =   | 9.2 cfs @  | 12.16 hrs, Volume= | 36,922 cf      | f           |                  |
| Outflow     | =   | 9.2 cfs @  | 12.16 hrs, Volume= | 36,922 cf      | f, Atten= 0 | )%, Lag= 0.0 min |
| Primary     | =   | 9.2 cfs @  | 12.16 hrs, Volume= | 36,922 cf      | f           |                  |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

\_

Peak Elev= 302.00' @ 12.22 hrs Flood Elev= 302.00'

| Device | Routing | Invert  | Outlet Devices   |
|--------|---------|---------|--|
| #1     | Primary | 296.85' | <b>30.0" Round Culvert</b><br>L= 5.0' CPP, projecting, no headwall, Ke= 0.900<br>Inlet / Outlet Invert= 296.85' / 296.80' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 4.91 sf |

Primary OutFlow Max=9.2 cfs @ 12.16 hrs HW=301.31' TW=301.07' (Dynamic Tailwater) ☐ 1=Culvert (Inlet Controls 9.2 cfs @ 1.87 fps)

#### Summary for Pond IC-1:

| Inflow Area | a = | 177,892 sf, | 14.37% Impervious, | Inflow Depth > 5.6 | 7" for 100-Year event   |
|-------------|-----|-------------|--------------------|--------------------|-------------------------|
| Inflow      | =   | 23.2 cfs @  | 12.15 hrs, Volume= | 84,063 cf          |                         |
| Outflow     | =   | 21.2 cfs @  | 12.19 hrs, Volume= | 79,518 cf, A       | Atten= 9%, Lag= 2.0 min |
| Discarded   | =   | 0.1 cfs @   | 7.80 hrs, Volume=  | 8,667 cf           |                         |
| Primary     | =   | 21.0 cfs @  | 12.19 hrs, Volume= | 70,851 cf          |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 288.60' @ 12.19 hrs Surf.Area= 2,271 sf Storage= 8,338 cf

Plug-Flow detention time= 47.5 min calculated for 79,518 cf (95% of inflow) Center-of-Mass det. time= 16.8 min (841.6 - 824.8)

| Volume | Invert  | Avail.Storage | Storage Description   |
|--------|---------|---------------|---|
| #1     | 282.40' | 3,658 cf      | IC-1 Stone bed (Irregular)Listed below (Recalc)                 |
|        |         |               | 14,147 cf Overall - 5,002 cf Embedded = 9,145 cf x 40.0% Voids  |
| #2     | 283.40' | 5,002 cf      | ADS_StormTech MC-4500 b +Cap x 44 Inside #1                     |
|        |         |               | Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf |
|        |         |               | Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap      |
|        |         |               | 44 Chambers in 4 Rows   |
|        |         |               | Cap Storage= +39.5 cf x 2 x 4 rows = 316.0 cf                   |
| #3     | 283.00' | 200 cf        | PES-1 Stone bed (Pyramidal)Listed below (Recalc)                |
|        |         |               | 625 cf Overall - 126 cf Embedded = 499 cf x 40.0% Voids         |
| #4     | 283.00' | 126 cf        | 24.0" Round Pipe Storage Inside #3                              |
|        |         |               | L= 40.0'  |

| Elevation | Surf.Area | Perim. | Inc.Store    | Cum.Store    | Wet.Area |
|-----------|-----------|--------|--------------|--------------|----------|
| (feet)    | (sq-ft)   | (feet) | (cubic-feet) | (cubic-feet) | (sq-ft)  |
| 282.40    | 2,021     | 188.0  | 0            | 0            | 2,021    |
| 283.00    | 2,021     | 188.0  | 1,213        | 1,213        | 2,134    |
| 284.00    | 2,021     | 188.0  | 2,021        | 3,234        | 2,322    |
| 285.00    | 2,021     | 188.0  | 2,021        | 5,255        | 2,510    |
| 286.00    | 2,021     | 188.0  | 2,021        | 7,276        | 2,698    |
| 287.00    | 2,021     | 188.0  | 2,021        | 9,297        | 2,886    |
| 288.00    | 2,021     | 188.0  | 2,021        | 11,318       | 3,074    |
| 289.00    | 2,021     | 188.0  | 2,021        | 13,339       | 3,262    |
| 289.40    | 2,021     | 188.0  | 808          | 14,147       | 3,337    |
|           |           |        |              |              |          |

8,985 cf Total Available Storage

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| Elevation<br>(feet) | Surf.Area<br>(sq-ft) | Inc.Store<br>(cubic-feet) | Cum.Store<br>(cubic-feet) | Wet.Area<br>(sq-ft <u>)</u> |
|---------------------|----------------------|---------------------------|---------------------------|-----------------------------|
| 283.00              | 250                  | 0                         | 0                         | 250                         |
| 284.00              | 250                  | 250                       | 250                       | 313                         |
| 285.00              | 250                  | 250                       | 500                       | 376                         |
| 285.50              | 250                  | 125                       | 625                       | 408                         |

| Device | Routing   | Invert  | Outlet Devices   |
|--------|-----------|---------|--|
| #1     | Discarded | 282.40' | 2.410 in/hr Exfiltration over Surface area                       |
| #2     | Primary   | 285.50' | 50.0' long x 2.5' breadth Broad-Crested Rectangular Weir         |
|        |           |         | Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00    |
|        |           |         | 2.50 3.00 3.50 4.00  |
|        |           |         | Coef. (English) 2.48 2.60 2.60 2.60 2.64 2.65 2.68 2.75 2.74     |
|        |           |         | 2.76 2.89 3.05 3.19 3.32   |
| #3     | Device 2  | 284.10' | 24.0" Round Culvert  |
|        |           |         | L= 70.0' CPP, projecting, no headwall, Ke= 0.900                 |
|        |           |         | Inlet / Outlet Invert= 284.10' / 283.00' S= 0.0157 '/' Cc= 0.900 |
|        |           |         | n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf      |
| #4     | Device 3  | 284.10' | 20.0" W x 12.0" H Vert. Orifice/Grate C= 0.600                   |
|        |           |         | Limited to weir flow at low heads                                |
| #5     | Device 3  | 287.00' | 4.0' long Sharp-Crested Vee/Trap Weir Cv= 2.62 (C= 3.28)         |

**Discarded OutFlow** Max=0.1 cfs @ 7.80 hrs HW=283.00' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=21.0 cfs @ 12.19 hrs HW=288.58' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Passes 21.0 cfs of 829.7 cfs potential flow) **3=Culvert** (Inlet Controls 21.0 cfs @ 6.67 fps)

**4=Orifice/Grate** (Passes < 14.1 cfs potential flow) **5=Sharp-Crested Vee/Trap Weir** (Passes < 26.0 cfs potential flow)

#### Summary for Pond IC-2:

| Inflow Area | ı = | 134,287 sf, | 7.03% Impervious,  | Inflow Depth > 5. | 39" for 100-Year event   |
|-------------|-----|-------------|--------------------|-------------------|--------------------------|
| Inflow      | =   | 15.2 cfs @  | 12.16 hrs, Volume= | 60,350 cf         |                          |
| Outflow     | =   | 13.2 cfs @  | 12.22 hrs, Volume= | 58,368 cf,        | Atten= 13%, Lag= 3.4 min |
| Discarded   | =   | 0.1 cfs @   | 7.36 hrs, Volume=  | 5,490 cf          | -                        |
| Primary     | =   | 13.1 cfs @  | 12.22 hrs, Volume= | 52,878 cf         |                          |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 301.82' @ 12.22 hrs Surf.Area= 1,497 sf Storage= 5,132 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 11.8 min (846.1 - 834.3)

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| Volume         | Inver     | t Avail.S | torage  | Storage I  | Description   | n               |             |                     |    |
|----------------|-----------|-----------|---------|--|---|-----------------|-------------|---------------------|----|
| #1             | 295.80    | ' 2,      | 234 cf  | IC-2 Stor  | IC-2 Stone bed (Irregular)Listed below (Recalc)               |                 |             |                     |    |
|                |           |           |         | 8,729 cf   | 8,729 cf Overall - 3,143 cf Embedded = 5,586 cf x 40.0% Voids |                 |             |                     |    |
| #2             | 296.80    | ' 3,      | 143 cf  | ADS_Sto  | ADS_StormTech MC-4500 b +Cap @ 4.03' Lx 28 Inside #1          |                 |             |                     |    |
|                |           |           |         | Effective  | Size= 90.4  | 4"W x 60.0"H    | => 26.46    | st x 4.03'L = 106.6 | ct |
|                |           |           |         | Overall S  | ize= 100.0  | 0"W x 60.0"H    | x 4.33'L v  | vith 0.31' Overlap  |    |
|                |           |           |         | 28 Cham  | bers in 2 l   | Kows            |             | 0 -5                |    |
| #2             | 206.00    | ,         | 170 of  |  | age= +39.<br>tono hod   | .5 CT X Z X Z C | WS = 158    | .U CI               |    |
| #3             | 296.00    |           |         | F00 of 0   |   | (Pyramidal)L    |             |                     |    |
| #1             | 206.00    | ,         | 71 cf   |  | verall - / I  |                 | ido #3      | x 40.0% volus       |    |
| # <del>4</del> | 290.00    |           | 710     | L = 40.0'  |   | e Storage ms    | ue #3       |                     |    |
|                |           | 5,        | 620 cf  | Total Ava  | ailable Sto   | rage            |             |                     |    |
| Elevatio       | on S      | urf.Area  | Perim.  | In   | c.Store   | Cum.Sto         | re          | Wet Area            |    |
| (fee           | et)       | (sq-ft)   | (feet)  | (cub   | ic-feet)  | (cubic-fee      | et)         | (sq-ft)             |    |
| 295.8          | 30        | 1.247     | 165.0   |  |   |                 | 0           | 1.247               |    |
| 296.0          | 00        | 1.247     | 165.0   |  | 249   | 24              | 19          | 1.280               |    |
| 297.0          | 00        | 1,247     | 165.0   |  | 1,247   | 1,49            | 96          | 1,445               |    |
| 298.0          | 00        | 1,247     | 165.0   |  | 1,247   | 2,74            | 13          | 1,610               |    |
| 299.0          | 00        | 1,247     | 165.0   |  | 1,247   | 3,99            | 90          | 1,775               |    |
| 300.0          | 00        | 1,247     | 165.0   |  | 1,247   | 5,23            | 37          | 1,940               |    |
| 301.0          | 00        | 1,247     | 165.0   |  | 1,247   | 6,48            | 34          | 2,105               |    |
| 302.0          | 00        | 1,247     | 165.0   |  | 1,247   | 7,73            | 31          | 2,270               |    |
| 302.8          | 30        | 1,247     | 165.0   |  | 998   | 8,72            | 29          | 2,402               |    |
| Elevatio       | on S      | urf.Area  | Inc     | .Store   | Cum.S   | Store \         | Net.Area    |                     |    |
| (fee           | et)       | (sq-ft)   | (cubio  | c-feet)  | (cubic-f  | feet)           | (sq-ft)     |                     |    |
| 296.0          | 00        | 250       |         | 0  |   | 0               | 250         |                     |    |
| 297.0          | 00        | 250       |         | 250  |   | 250             | 313         |                     |    |
| 298.0          | 00        | 250       |         | 250  |   | 500             | 376         |                     |    |
| Device         | Routing   | Inver     | t Outle | et Devices                                       | i   |                 |             |                     |    |
| #1             | Discarded | 295.80    | 2.41    | 0 in/hr Ex                                       | filtration  | over Surface    | area        |                     |    |
| #2             | Primary   | 298.00    | 50.0    | long x 2   | .0' bread!  | th Broad-Cre    | sted Rect   | tangular Weir       |    |
|                | 2         |           | Head    | d (feet) 0.                                      | 20 0.40 (   | 0.60 0.80 1.0   | 00 1.20 1   | .40 1.60 1.80 2.00  | 0  |
|                |           |           | 2.50    | 3.00 3.5   | 0   |                 |             |                     |    |
|                |           |           | Coef    | . (English)                                      | ) 2.54 2.6  | 61 2.61 2.60    | 2.66 2.7    | 0 2.77 2.89 2.88    |    |
|                |           |           | 2.85    | 3.07 3.2   | 0 3.32  |                 |             |                     |    |
| #3             | Device 2  | 296.50    | ' 18.0  | 8.0" Round Culvert                               |   |                 |             |                     |    |
|                |           |           | L= 2    | L= 20.0' CPP, projecting, no headwall, Ke= 0.900 |   |                 |             |                     |    |
|                |           |           | Inlet   | / Outlet In                                      | vert= 296   | .50' / 296.00'  | S= 0.025    | 50 '/' Cc= 0.900    |    |
|                |           | 000 -0    | n= 0    | .013 Corr  | ugated PE   | =, smooth inte  | erior, Flow | / Area= 1.77 sf     |    |
| #4             | Device 3  | 296.50    | 23.0    | W X 6.0'   | H Vert. C   | Jrifice/Grate   | C = 0.600   | J                   |    |
| #E             | Dovice 2  | 200.00    |         | eu lo Welf                                       | now at iov  | w neads         | loir Cur C  | (C - 2.20)          |    |
| #3             | Device 3  | 299.90    | 4.0     | iong snar  | p-crested   | u vee/irap W    |             | uz (U- 3.Zð)        |    |

**Discarded OutFlow** Max=0.1 cfs @ 7.36 hrs HW=296.00' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.1 cfs)

Primary OutFlow Max=13.1 cfs @ 12.22 hrs HW=301.81' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Passes 13.1 cfs of 1,236.5 cfs potential flow) 3=Culvert (Inlet Controls 13.1 cfs @ 7.42 fps) 4=Orifice/Grate (Passes < 9.0 cfs potential flow) 5=Sharp-Crested Vee/Trap Weir (Passes < 34.7 cfs potential flow)

## Summary for Pond SD-1:

| Inflow Area | ı = | 3,729 sf, | 47.63% Impervious, | Inflow Depth > 6. | .80" for 100-Year event |
|-------------|-----|-----------|--------------------|-------------------|-------------------------|
| Inflow      | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,115 cf          |                         |
| Outflow     | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,075 cf,         | Atten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 6.30 hrs, Volume=  | 431 cf            |                         |
| Primary     | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 1,644 cf          |                         |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 300.93' @ 12.12 hrs Surf.Area= 109 sf Storage= 40 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow) Center-of-Mass det. time= 6.3 min ( 804.4 - 798.1 )

| Volume           | Invert               | Avail.S            | torage   | Storage Descriptio   | 'n   |  |
|------------------|----------------------|--------------------|--|--|--|--|
| #1               | 300.00'              |                    | 44 cf  | ed below (Recalc)  |  |  |
| Elevatio<br>(fee | on Su<br>et)         | rf.Area<br>(sq-ft) | Perim.<br>(feet)   | Inc.Store<br>(cubic-feet)  | Cum.Store<br>(cubic-feet)  | Wet.Area<br>(sq-ft)  |
| 300.0<br>301.0   | )0<br>)0             | 109<br>109         | 113.3<br>113.3   | 0<br>109   | 0<br>109   | 109<br>222   |
| Device           | Routing              | Inve               | rt Outle   | et Devices   |  |  |
| #1<br>#2         | Discarded<br>Primary | 300.00<br>300.90   | )' <b>2.41</b><br>)' <b>55.0</b><br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration</b><br><b>' long x 4.0' bread</b><br>d (feet) 0.20 0.40<br>3.00 3.50 4.00 4<br>f. (English) 2.38 2.4<br>2.72 2.73 2.76 2 | over Surface are     th Broad-Crested     0.60   0.80   1.00     .50   5.00   5.50     54   2.69   2.68   2.6     .79   2.88   3.07   3. | ea<br>d Rectangular Weir<br>1.20 1.40 1.60 1.80 2.00<br>67 2.67 2.65 2.66 2.66<br>32 |

**Discarded OutFlow** Max=0.0 cfs @ 6.30 hrs HW=300.01' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.6 cfs @ 12.12 hrs HW=300.93' TW=0.00' (Dynamic Tailwater) 2=Broad-Crested Rectangular Weir (Weir Controls 0.6 cfs @ 0.40 fps) Five Paths, Tax Map 39, Parcel 15A, Wayland, MAPost-Dev Rev 2NRCC 24-hr D100-Year Rainfall=8.62"Prepared by Goldsmith, Prest & Ringwall, Inc.Printed 7/14/2020HydroCAD® 10.10-4a s/n 01036 © 2020 HydroCAD Software Solutions LLCPage 115

## Summary for Pond SD-2:

| Inflow Area | a = | 4,504 sf, | 4.43% Impervious,  | Inflow Depth > 5.48 | for 100-Year event     |
|-------------|-----|-----------|--------------------|---------------------|------------------------|
| Inflow      | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,055 cf            |                        |
| Outflow     | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 2,041 cf, At        | tten= 0%, Lag= 0.0 min |
| Discarded   | =   | 0.0 cfs @ | 6.50 hrs, Volume=  | 147 cf              | -                      |
| Primary     | =   | 0.6 cfs @ | 12.12 hrs, Volume= | 1,894 cf            |                        |

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2 Peak Elev= 303.46' @ 12.12 hrs Surf.Area= 40 sf Storage= 15 cf

Plug-Flow detention time= 7.0 min calculated for 2,041 cf (99% of inflow) Center-of-Mass det. time= 2.7 min (833.4 - 830.7)

| Volume         | Invert               | Avail.Sto            | rage   | e Storage Description   |   |   |  |  |
|----------------|----------------------|----------------------|--|---|---|---|--|--|
| #1             | 302.50'              |                      | 16 cf  | cf <b>Custom Stage Data (Irregular)</b> Listed below (Recalc)<br>40 cf Overall x 40.0% Voids  |   |   |  |  |
| Elevatio       | on Sui<br>et)        | rf.Area P<br>(sq-ft) | Perim.<br>(feet)                             | Inc.Store<br>(cubic-feet)   | Cum.Store<br>(cubic-feet)   | Wet.Area<br>(sq-ft)   |  |  |
| 302.5<br>303.5 | 50<br>50             | 40<br>40             | 44.0<br>44.0                                 | 0<br>40   | 0<br>40   | 40<br>84  |  |  |
| Device         | Routing              | Invert               | Outle  | et Devices  |   |   |  |  |
| #1<br>#2       | Discarded<br>Primary | 302.50'<br>303.40'   | 2.41<br>20.0<br>Head<br>2.50<br>Coef<br>2.68 | <b>0 in/hr Exfiltration o</b><br><b>' long x 4.0' breadth</b><br>d (feet) 0.20 0.40 0<br>3.00 3.50 4.00 4.5<br>f. (English) 2.38 2.54<br>2.72 2.73 2.76 2.7 | <b>ver Surface area</b><br><b>Broad-Crested I</b><br>.60 0.80 1.00 1.2<br>50 5.00 5.50<br>4 2.69 2.68 2.67<br>79 2.88 3.07 3.32 | <b>Rectangular Weir</b><br>20 1.40 1.60 1.80 2.00<br>2.67 2.65 2.66 2.66<br>2 |  |  |

**Discarded OutFlow** Max=0.0 cfs @ 6.50 hrs HW=302.51' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.0 cfs)

Primary OutFlow Max=0.6 cfs @ 12.12 hrs HW=303.46' TW=0.00' (Dynamic Tailwater) ←2=Broad-Crested Rectangular Weir (Weir Controls 0.6 cfs @ 0.57 fps)

#### Summary for Link AP1:

| Inflow A | Area | a = | 224,752 sf, | 11.85% Imper  | rvious, | Inflow Depth > | 4.86"   | for 10  | 0-Year event |
|----------|------|-----|-------------|---------------|---------|----------------|---------|---------|--------------|
| Inflow   |      | =   | 26.1 cfs @  | 12.16 hrs, Vo | olume=  | 90,983         | cf      |         |              |
| Primary  | y    | =   | 26.1 cfs @  | 12.16 hrs, Vo | olume=  | 90,983         | cf, Att | en= 0%, | Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

## Summary for Link AP2:

| Inflow A | Area = | 42,170 sf, | 25.53% Impervious, | Inflow Depth > 5 | .46" for 100-Year event |
|----------|--------|------------|--------------------|------------------|-------------------------|
| Inflow   | =      | 5.8 cfs @  | 12.13 hrs, Volume= | 19,178 cf        |                         |
| Primary  | / =    | 5.8 cfs @  | 12.13 hrs, Volume= | 19,178 cf,       | Atten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### **Summary for Link AP3:**

| Inflow A | rea = | 196,746 sf, | 5.32% Impervious,  | Inflow Depth > | 4.85'  | for 100-Year event    |
|----------|-------|-------------|--------------------|----------------|--------|-----------------------|
| Inflow   | =     | 19.6 cfs @  | 12.20 hrs, Volume= | 79,448 0       | cf     |                       |
| Primary  | =     | 19.6 cfs @  | 12.20 hrs, Volume= | 79,448 0       | of, At | ten= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### Summary for Link AP4:

| Inflow Ar | rea = | 14,618 sf, | 41.41% Impervious, | Inflow Depth > | 6.34"   | for 100-Year event   |
|-----------|-------|------------|--------------------|----------------|---------|----------------------|
| Inflow    | =     | 1.8 cfs @  | 12.15 hrs, Volume= | 7,719 c        | f       |                      |
| Primary   | =     | 1.8 cfs @  | 12.15 hrs, Volume= | 7,719 c        | f, Atte | en= 0%, Lag= 0.0 min |

Primary outflow = Inflow, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

#### Stormwater Management Standard 3 GROUNDWATER RECHARGE

**Pre-Development Conditions** 

Five Paths Wayland, MA Project No. 171053

|  |             | <u>Area (sf)</u>     | <u>Area (Ac)</u> |
|--|-------------|----------------------|------------------|
| Total Subcatchment Areas                   |             | 478,286              | 11.0             |
| Total Subcatchment Areas On-Site           |             | 478,286              | 11.0             |
| Total Area of Hydrolic Soil Groups On-Site |             | 478,286              | 11.0             |
|  | С           | 478,286              | 11.0             |
| Surface Type Areas                         |             |                      |                  |
| >75% Grass cover, Good<br>Pavement         | C<br>C      | 63,276<br>7,450      | 1.5<br>0.2       |
| Roofs                                      | С           | 3,874                | 0.1              |
| Unconnected pavement                       | C           | 16,501               | 0.4              |
| TOTAL AREA                                 | C           | 387,185<br>478,286   | 8.9<br>11.0      |
| Total Impervious Area                      |             | 27,825               | 0.6              |
| Infiltration Volume                        |             |                      |                  |
| Inches of Recharge per Storm Event         | A<br>B<br>C | 0.60<br>0.35<br>0.25 |                  |
|  | D           | 0.10                 |                  |

Infiltration Volume =∑ {[(Total Subcatchment Area within HSG) - (Total Impervious Area within HSG)]

x (inches of Recharge Per Storm)}

Infiltration Volume

9,385 CF

## Stormwater Management Standard 3 GROUNDWATER RECHARGE

Post Development Conditions

Five Paths Wayland, MA Project No. 171053

|   |        | Area (sf)                   |          |                                   |
|---|--------|-----------------------------|----------|-----------------------------------|
| Total Subcatchmont Aroas  |        | <u>Area (SI)</u><br>478 286 |          | <u>Alea (AC)</u>                  |
| Total Subcatchment Areas  |        | 478,200                     |          | 11.0                              |
| Total Subcatchment Areas On-Site                                  |        | 478,200                     |          | 11.0                              |
| Total Area of Hydrolic Soll Groups On-Site                        |        | 478,200                     |          | 11.0                              |
|   | С      | 478,286                     |          | 11.0                              |
| Surface Type Areas  |        |                             |          |                                   |
| >75% Grass cover, Good  | С      | 156,005                     |          | 3.6                               |
| Gravel  | С      | 1,665                       |          | 0.0                               |
| Pavement  | С      | 27,894                      |          | 0.6                               |
| Roofs   | С      | 9,202                       |          | 0.2                               |
| Unconnected pavement  | C      | 16,818                      |          | 0.4                               |
|   | C      | 200,702                     |          | 0.1<br>11.0                       |
| TOTAL AREA  |        | 470,200                     |          | 11.0                              |
| Total Impervious Area   |        | 53,914                      |          | 1.2                               |
| Infiltration Volume   |        |                             |          |                                   |
| Inches of Recharge per Storm Event                                | А      | 0.60                        |          |                                   |
|   | В      | 0.35                        |          |                                   |
|   | С      | 0.25                        |          |                                   |
|   | D      | 0.10                        |          |                                   |
| Infiltration Volume = $\sum \{ [(Total Subcatchment Area within $ | HSG) - | (Total Imperviou            | s Area v | within HSG)]                      |
|   |        |                             | x (inc   | ches of Recharge Per Storm)}      |
| Natural Infiltration Volume                                       |        | 8,841                       | CF       |                                   |
| Pre-Development Infiltration Volume                               |        | 9,385                       | CF       |                                   |
| Required Infiltration Volume                                      |        | 544                         | CF       |                                   |
| Provided Infiltration Volume                                      |        |                             |          |                                   |
| Infilration Chambers (IC-1)                                       |        | 4,515                       | CF       | Storage below outlet Elev. 285.50 |
| Infilration Chambers (IC-2)                                       |        | 1,966                       | CF       | Storage below outlet Elev. 298.00 |
| Total Provided Iniltration Volume                                 |        | 6,481                       | CF       |                                   |

#### Stormwater Management Standard 3 GROUNDWATER RECHARGE

#### **Infiltration Area Requirements**

#### **Drawdown Time**

(Per Massachusetts Stormwater regulations, infiltration areas must completely drain within 72 hours)

|                                  | _     | IC-1  | IC-2  |
|----------------------------------|-------|-------|-------|
| Infiltration Area Storage Volume | cf    | 4,515 | 1,966 |
| Design infiltration Rate         | in/hr | 2.41  | 2.41  |
| Infiltration Bottom Area         | sf    | 2021  | 1247  |

Drawdown Time = Infiltration Area Storage Volume / [Design Infiltration Rate x Infiltration Area Bottom Area]

| Drawdown Time (Hrs) | 11.1 | 7.9 |
|---------------------|------|-----|
|                     |      |     |

#### **Mounding Analysis**

Per the Massachusetts Stormwater Handbook, mounding analysis is required when ".. The vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four feet and the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm." The mounding analysis "... must show that the REQUIRED RECHARGE VOLUME is fully dewatered within 72 hours..."

|   |        | IC-1                  | IC-2                               |
|---|--------|-----------------------|------------------------------------|
| Hydraulic Conductivity                            | ft/day | 16                    | 16                                 |
|   |        | Lower Range Standar   | d Value for "Medium Sand" material |
| Specific Yield                                    |        | 0.28                  | 0.28                               |
|   |        | Standard Value for "M | edium Sand" material               |
| Initial Saturated Thickness                       | ft     | 10                    | 10                                 |
|   |        | Depth to bedrock      |                                    |
| Design Recharge Rate                              | ft/day | 4.82                  | 4.82                               |
|   |        | infiltration rate     |                                    |
| Time  | days   | 3                     | 3                                  |
|   |        | Minimum 72 hr evalua  | tion period                        |
| Bottom Infiltrating Area                          | sf     | 2,021                 | 1,247                              |
| Length of Infiltration Area                       | ft     | 55.8                  | 79.9                               |
| Width of Infiltration Area                        | ft     | 36.2                  | 15.6                               |
| Time when Infiltration Stops                      | days   | 0.46                  | 0.33                               |
|   |        | Calculated Drawdown   | Time (see Above)                   |
| Maximum Water table rise at 72 hours <sup>1</sup> | ft     | 0.77                  | 0.40                               |

# - Resulting mound will not interfere with the full draining of the infiltration

area in accordance with Mass Stormwater Standards -

<sup>1</sup> - mounding analysis calculated using the MOUNDSOLV Wizaard, Groundwater Mounding Analysis For A Sloping Water-Table Aquifer, Zlotnik Et Al. (2017) Solution.

# Stormwater Management Standard 4 WATER QUALITY RETENTION VOLUME

Five Paths Wayland, MA Project No. 171053

| Parameter   | Unit     | Quantity         |          | Remarks  |
|---|----------|------------------|----------|--|
| Watershed area  | sf       | 478,286          |          |  |
| Predevelopment impervious area<br>Total impervious area added         | sf<br>sf | 27,825<br>26,089 |          |  |
| Total impervious area<br>Total impervious area required for retention | sf<br>sf | 53,914<br>26,089 | -        |  |
| Runoff depth over impervious area                                     | IN       | 0.5              |          |  |
| Required Water Quality Volume   | CF       | 1,087            |          |  |
| Provided Water Quality Volume   |          |                  |          |  |
| Infilration Chambers (IC-1)<br>Infilration Chambers (IC-2)            |          | 4,515<br>1,966   | CF<br>CF | Storage below outlet Elev. 285.50<br>Storage below outlet Elev. 298.00 |
| DESIGN VOLUME PROVIDED  | CF       | 6,481            |          |  |

#### Stormwater Management Standard 4 TSS REMOVAL

Five Paths Wayland, MA Project No. 171053

| Process Train<br>No.           | Impervious<br>Area (SF) | ВМР<br>Туре | TSS<br>Removal Rate | TSS Remaining<br>at Discharge | TSS Removed<br>at Discharge |
|--------------------------------|-------------------------|-------------|---------------------|-------------------------------|-----------------------------|
| SC1.1, SC1.2, SC1.3<br>& SC1.4 | 25,567                  | СВ          | 25%                 | 75%                           | 25%                         |
|                                |                         | IC          | 80%                 | 15%                           | 85%                         |
|                                |                         |             |                     |                               |                             |
| SC1.6                          | 622                     | Untreated   | 0%                  | 100%                          | 0%                          |
| SC2.1                          | 1,776                   | Clean roof  | 100%                | 0%                            | 100%                        |
| SC3.1, SC3.2 &                 | 9,444                   | СВ          | 25%                 | 75%                           | 25%                         |
| 303.4                          |                         | IC          | 80%                 | 15%                           | 85%                         |

**Total Development Weighted Average** 

84%

#### ABBREVIATIONS:

TSS=total suspended solids; SF=square feet; SC=subcatchment; GC=grassed channel; BMP=best management practices; CB=deep sump hooded catch basin; FB = Sediment Forebay; INF=infiltration basin; WB=wet basin; SP=Silt Prison Catch Basin; DW=drywell