

Andrew MacNichol
Community Development Director
16 Lowell Street
Reading, MA 01867

Date
August 11, 2023

**RE: Drainage Narrative
Definitive Subdivision
Annette Land
Reading, MA**

Dear Mr. MacNichol,

On behalf of our Client, Peter Seibold, Somerville Engineering (SE) has prepared this drainage narrative in support of the Definitive Subdivision for 0 Annette Lane. This letter will summarize the stormwater management system for the proposed development.

Existing Conditions

It is understood that the property at 0 Annette Lane (Assessors Map 38 Parcel 139) is a 54,942 square foot (sf) lot and is currently undeveloped, as illustrated on the Plot Plan prepared by Vineyard Engineering & Environmental Services, Inc. A review of the NRCS soil report for Middlesex County indicates that the soil onsite is considered Merrimac-Urban Land which has a Hydrologic Soil Group rating of an "A".

There is no evidence of any existing stormwater systems on the existing site. The topography of the site has a high point in the middle resulting in two watersheds, one that discharges to the northerly wetland and one that discharges to the southerly wetland. and slopes to the low point at the southeasterly corner of the site. A stormwater study point for the entire site has been modeled in HydroCAD and attached for review and a copy of the Existing Watershed Plan is included herewith.

Proposed Conditions

It is understood that the project proposes constructing a single-family home and a new driveway. The proposed project will result in a total impervious area of 4,131 sf.

There will be no significant change in the site's proposed topography.

Site improvements have been illustrated on the attached Proposed Site plan prepared and stamped by Carlton M Quinn Professional Civil Engineer, dated August 11, 2023. The proposed site improvements will result in a land disturbance of approximately 13,000 sf and a net increase of 4,131 sf of impervious area on site.

Stormwater Mitigation

Proposed stormwater mitigation has been provided by the installation of two leaching fields, one to collect the roof runoff and the second to collect the driveway runoff. Additionally, a stone trench is proposed to mitigate the conversion of surface cover from "Woods" to "Grass". These infiltration systems have been modeled in HydroCAD and the calculations are illustrated in the attached report. The infiltration systems are designed to collect and infiltrate all stormwater collected for all storm events up to and including the 100-year storm event.

The attached storm water runoff analysis was performed of the existing and proposed conditions and includes an estimate of the peak rates and volume runoffs from various rainfall events. Peak rates and volume runoffs were developed using TR55 Urban Hydrology for Small Watersheds, developed by the U.S. Department of Commerce, Engineering Division and the HydroCAD computer program. Further, the

analysis has been prepared in accordance with the MassDEP and the Town of Reading requirements and standard engineering practices.

Below is a summary table of the peak rate and volumes: runoff has been estimated for each watershed during the 2, 10, 25, and 100-year storm events.

Peak Flow Rates

Study Point #1 (Northerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CFS)	0.00	0.00	0.01	0.12
Proposed Runoff (CFS)	0.00	0.00	0.00	0.09
% REDUCTION	No Change	No Change	100%	25%

Study Point #2 (Southerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CFS)	0.00	0.00	0.00	0.11
Proposed Runoff (CFS)	0.00	0.00	0.00	0.08
% REDUCTION	No Change	No Change	No Change	27.3%

Peak Volumes

Study Point #1 (Northerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CF)	0	4	164	1,119
Proposed Runoff (CF)	0	3	119	810
% REDUCTION	No Change	25%	27.4%	27.6%

Study Point #2 (Southerly Flow Offsite)

	2-Year 3.22 inches	10-Year 4.89 inches	25-Year 6.22 inches	100-Year 8.94 inches
Existing Runoff (CF)	0	3	140	953
Proposed Runoff (CF)	0	8	116	670
% REDUCTION	No Change	Insignificant increase	17.1%	29.7%

As illustrated on the attached HydroCAD calculation sheets the infiltration systems are recharging 100% of the stormwater collected. This results in 100% of the stormwater TSS and phosphorus removal so no additional calculations are required.

Groundwater Elevation

Soil test pit logs have been provided as an attachment and are noted on the proposed site plan.

Please let me know if you have any questions.

Sincerely,



Carlton Quinn, PE
Principal



Attachments:

1. **Operation & Maintenance Plan**
2. **Existing Watershed Plan**
3. **Proposed Watershed Plan**
4. **Predevelopment HydroCAD Calculations**
5. **Post development HydroCAD Calculations**
6. **Extreme Precipitation Tables**
7. **NRCS Soil Report**
8. **Soil Test Pit Logs**

Section 2.0 Operation & Maintenance Plan

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SECTION 2.0 OPERATION & MAINTENANCE PLAN2-1

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OPERATION & MAINTENANCE PLAN

*Definitive Subdivision
0 Annette Lane Reading, MA*

*Project #220304-01
August 11, 2023*

- **INTRODUCTION**

In accordance with the standards set forth by the Stormwater Management Policy issued by the Department of Environmental Protection (DEP), Somerville Engineering (SE) has prepared the following Operation and Maintenance Plan for the new development of the mixed-use development located at 0 Annette Lane, Reading, MA.

The plan is broken down into three major sections. The first section describes construction-related erosion and sedimentation controls (Construction Period). The second section describes the long-term pollution prevention measures (Long Term Pollution Prevention Plan). The third section is a post-construction operation and maintenance plan designed to address the long-term maintenance needs of the stormwater management system (Long Term Maintenance Plan).

- **NOTIFICATION PROCEDURES FOR CHANGE OF RESPONSIBILITY FOR O&M**

The Stormwater Management System (SMS) for this project is owned by Peter Seibold (owner). The owner shall be legally responsible for the long-term operation and maintenance of this SMS as outlined in this Operation and Maintenance (O&M) Plan.

In the event the SMS will serve multiple lots/owners, such as the subdivision of the existing parcel or creation of lease areas, the owner(s) shall establish an association or other legally enforceable arrangements under which the association or a single party shall have legal responsibility for the operation and maintenance of the entire SMS. The legal instrument creating such responsibility shall be recorded with the Registry of Deeds and promptly following its recording, a copy thereof shall be furnished to the Commission.

- **CONTACT INFORMATION**

Stormwater Management System Owner: Peter Seibold
437 Summer Avenue
Reading, MA 01867

Emergency Contact Information:

○ Reading Public Works	Phone (781) 942-9092
○ Reading Fire Department (non-emergency line)	Phone (781) 944-3132
○ DEP Emergency Response (Mass DEP)	Phone (888) 304-1133
○ Clean Harbors Inc (24-Hour Line)	Phone (800) 645-8265

OPERATION & MAINTENANCE PLAN

Definitive Subdivision
0 Annette Lane Reading, MA

Project #220304-01
August 11, 2023

• CONSTRUCTION PERIOD

1. Prior to the commencement of any site work, the Applicant and general contractor shall meet with the Town Planner, Building Inspector, and the Board's Consulting Engineer to establish a construction phasing schedule and designated construction route.
2. Install Erosion Control measures as shown on the Site Preparation Plan prepared by SE. Install Construction fencing if determined to be necessary at the commencement of construction.
3. Install construction entrances, hay bales, and tubular barriers at the locations shown on the Site Preparation Plan prepared by SE.
4. Site access shall be achieved only from the designated construction entrance.
5. Stockpiles of materials subject to erosion shall be stabilized with erosion control matting or temporary seeding whenever practicable, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.
6. Install silt sacks and hay bales around each drain inlet prior to any demotion and or construction activities.
7. All erosion control measures shall be inspected weekly and after every rainfall event. Records of these inspections shall be kept on site for review by the Town.
8. All erosion control measures shall be maintained, repaired or replaced as required or at the direction of the owner's engineer or the Town Engineer.
9. Sediment accumulation up-gradient of the hay bales, silt fence, and stone check dams greater than 6" in depth shall be removed and disposed of in accordance with all applicable regulations.
10. If it appears that sediment is exiting the site, silt sacks shall be installed in all catch basins adjacent to the site. Sediment accumulation on all adjacent catch basin inlets shall be removed and the silt sack replaced if torn or damaged.
11. The contractor shall comply with the Sedimentation and Erosion Control Notes as shown on the Site Development Plans and Specifications.
12. The stabilized construction entrances shall be inspected weekly and records of inspections kept. The entrances shall be maintained by adding additional clean, angular, durable stone to remove the soil from the construction vehicle's tires when exiting the site. If soil is still leaving the site via the construction vehicle tires, adjacent roadways shall be kept clean by street sweeping.
13. Dust pollution shall be controlled using on-site water trucks and or an approved soil stabilization product.

- **LONG TERM POLLUTION PREVENTION PLAN**

Standard #4 from the MA DEP Stormwater Management Handbook requires that a Long-Term Pollution Prevention Plan (LTPPP) be prepared and incorporated as part of the Operation and Maintenance of the Stormwater Management System. The purpose of the LTPPP is to identify potential sources of pollution that may affect the quality of stormwater discharges, and to describe the implementation of practices to reduce the pollutants in stormwater discharges. The following items describe the source control and proper procedures for the LTPPP.

- HOUSEKEEPING

The proposed site development will be designed to maintain a high level of water quality treatment for all stormwater discharge to the resource areas. An Operation and Maintenance (O&M) plan has been prepared and is included in this section of the report. The owner (or its designee) is responsible for adherence to the O&M plan in a strict and complete manner.

- VEHICLE WASHING

Outdoor vehicle washing has the potential to result in high loads of nutrients, metals, and hydrocarbons during dry weather conditions, as the detergent-rich water used to wash the grime off the vehicle enters the stormwater drainage system. The proposed project does not include any designated vehicle washing areas, nor is it expected that any vehicle washing will take place on-site.

- **LONG TERM MAINTENANCE PLAN – FACILITIES DESCRIPTION**

The SMS shall be inspected immediately after construction. A maintenance log will be kept (i.e. report) summarizing inspections, maintenance, and any corrective actions taken. The log will include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, the location where the sediment and debris was disposed after removal will be indicated. The log will be made accessible to department staff and a copy provided to the department upon request.

The following is a description of the stormwater management system for the project site.

Stormwater Collection System – On Site:

The stormwater collection system consists of roof drains the route to an underground infiltration system. This system consists of two leaching fields. This system shall be inspected twice per year. Perform a visual inspection of the System using the drain manhole for access (may require OSHA confined space measures). Use a Jet Vac to clean when the sediment depth reaches 3". Refer to attached manufacturer's information regarding maintenance procedures.

- **INSPECTION AND MAINTENANCE FREQUENCY AND CORRECTIVE MEASURES**

In accordance with MA DEP Stormwater Handbook: Volume 2, Chapter 2; the following areas, facilities, and measures will be inspected and the identified deficiencies will be corrected. Clean-out must include the removal and legal disposal of any accumulated sediments, trash, and debris. In any and all cases, operations, inspections, and maintenance activities shall utilize best practical measures to avoid and minimize impacts to wetland resource areas outside the foot print of the SMS.

- **SUPPLEMENTAL INFORMATION**

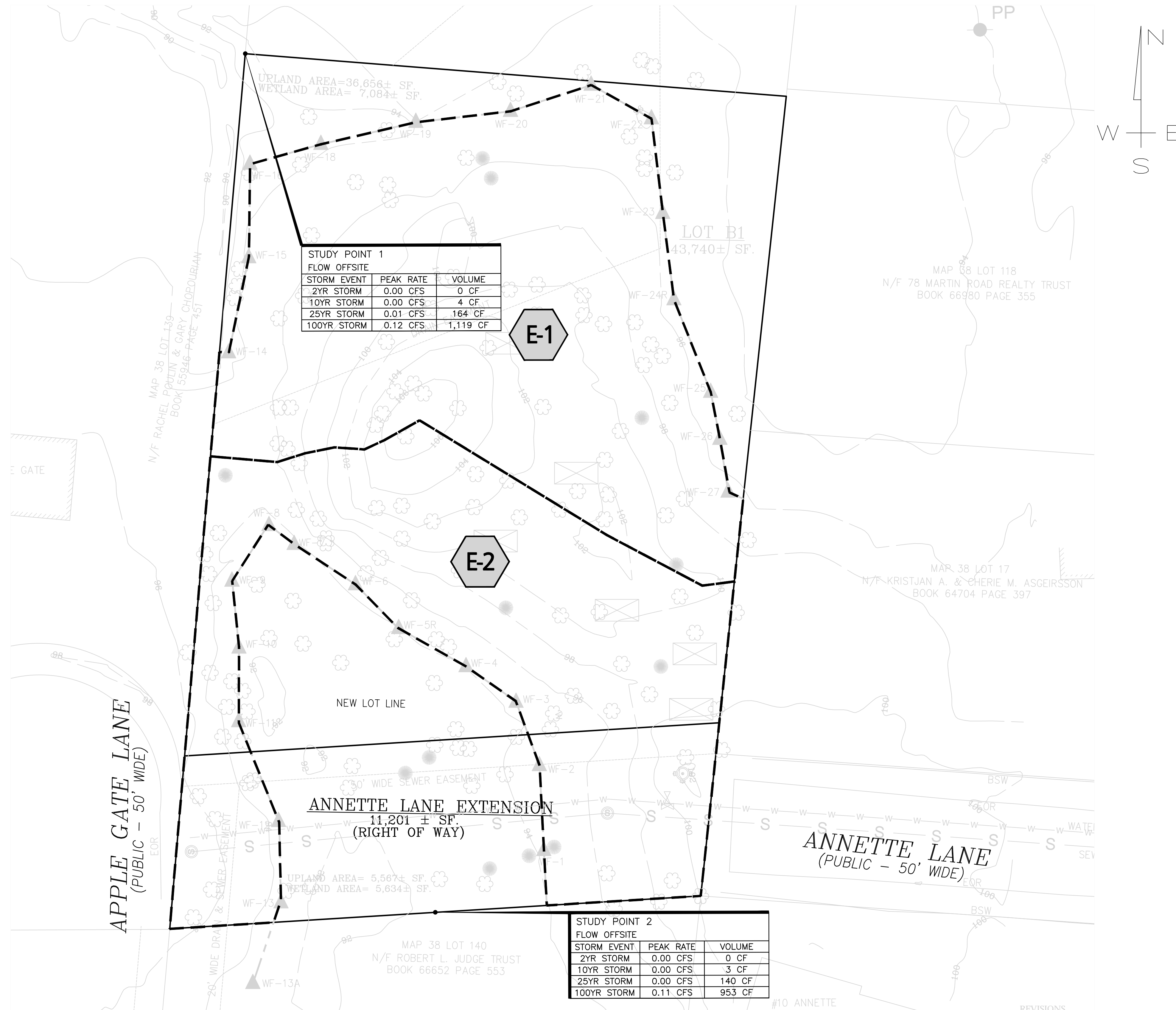
- Operation & Maintenance Log

0 ANNETTE LANE, READING, MA

Note all cleanouts, anomalies, degradation, and corrections.

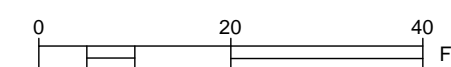
	Structure or Task	Maintenance Activity	Maintenance Cost/Unit	Schedule	Estimated Annual Maintenance Cost	Inspection Performed By	
						Date:	By:
BMP	Infiltration System	Perform a visual inspection of the System using the drain manhole for access (may require OSHA confined space measures). Use a Jet Vac to clean when the sediment depth reaches 3". Refer to attached manufacturer's information regarding maintenance procedures.	\$500/inspection	Twice Annually (Early spring & late fall)	\$500		

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GENERAL NOTES:

- EXISTING SITE FEATURES WERE OBTAINED FROM AN ACTUAL FIELD SURVEY PERFORMED BY VINEYARD ENGINEERING & ENVIRONMENTAL SERVICES, INC.
- TOPOGRAPHY NOTED IS BASED UPON AN ASSUMED DATUM. CONTRACTOR SHALL CONFIRM ELEVATIONS WITH BENCHMARK PROVIDED BY PROFESSIONAL LAND SURVYOR



REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

PROJECT:

**DEFINITIVE
SUBDIVISION**
ANNETTE LANE
READING, MA

**SE | SOMERVILLE
ENGINEERING**

519 SOMERVILLE AVENUE, SUITE #285
SOMERVILLE, MA 02144
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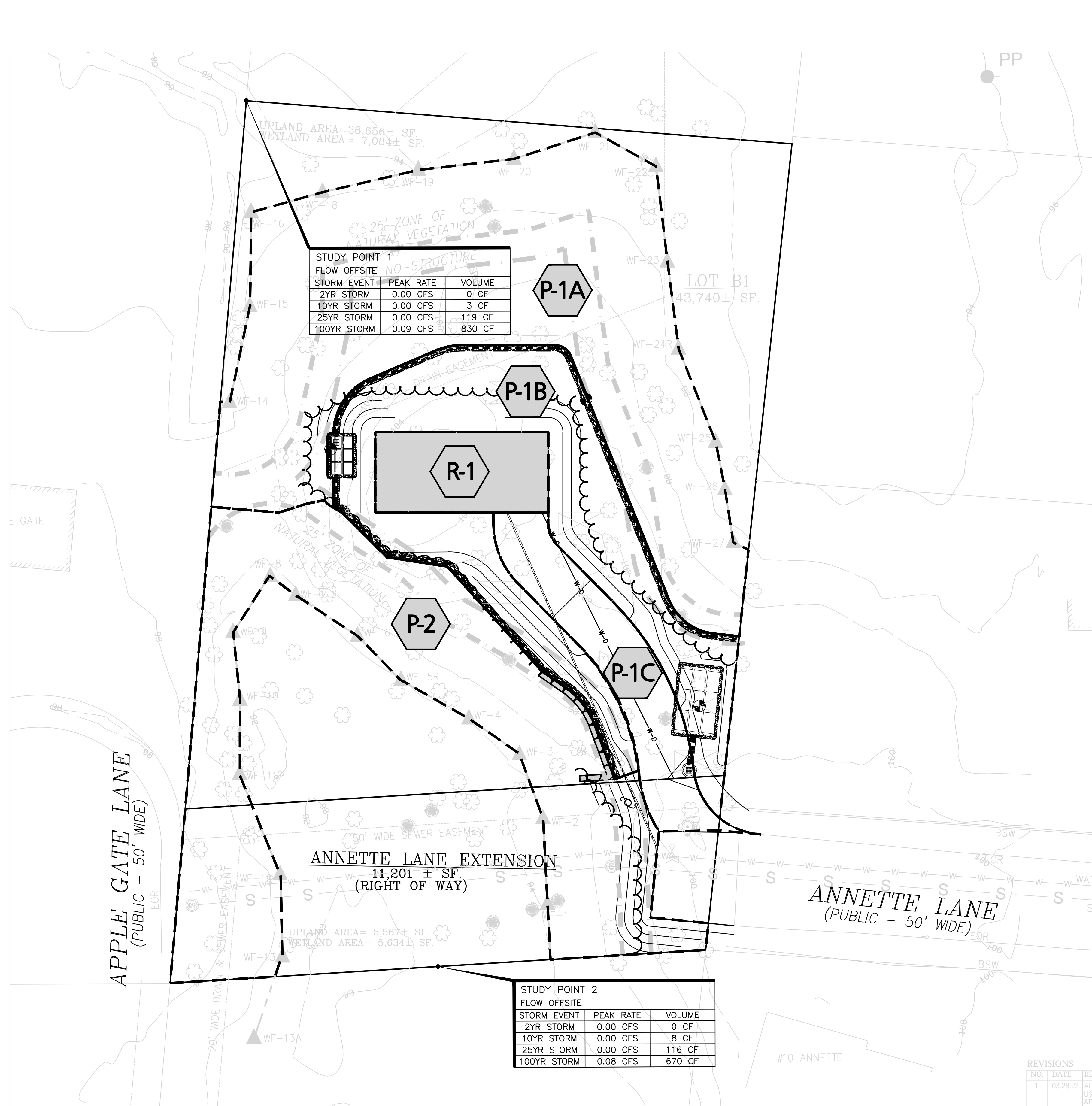
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PROJECT #: 202304-01

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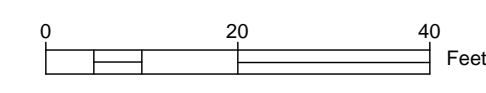
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GENERAL NOTES:

- EXISTING SITE FEATURES WERE OBTAINED FROM AN ACTUAL FIELD SURVEY PERFORMED BY VINEYARD ENGINEERING & ENVIRONMENTAL SERVICES, INC.
- TOPOGRAPHY NOTED IS BASED UPON AN ASSUMED DATUM. CONTRACTOR SHALL CONFIRM ELEVATIONS WITH BENCHMARK PROVIDED BY PROFESSIONAL LAND SURVYOR



REVISIONS

OWNER:

PETER SEIBOLD
437 SUMMER AVENUE
READING, MA 01867

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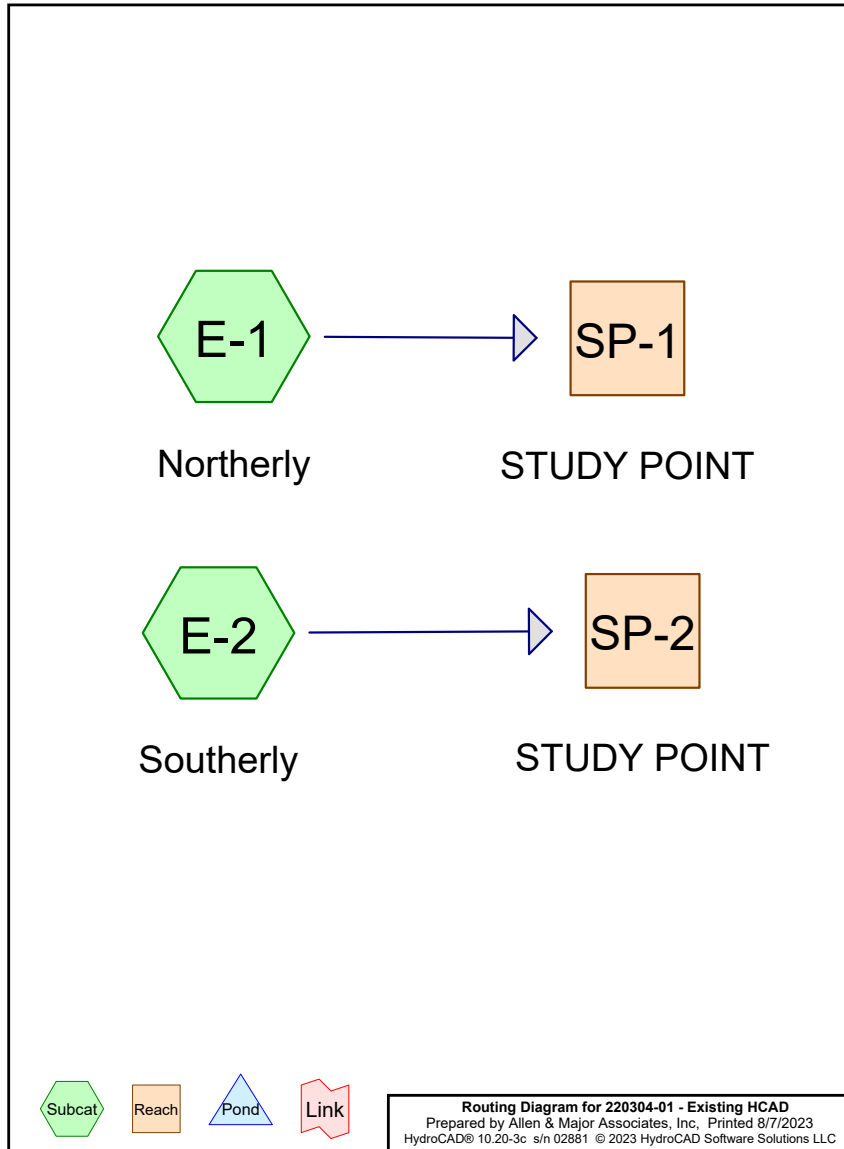
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SCALE:	1"=20'
PROJECT #:	202304-01
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TITLE:	SHEET:
PROPOSED WATERSHED PLAN	PWS



220304-01 - Existing HCAD

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Summary for Subcatchment E-1: Northerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Subcatchment E-1: Northerly

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 4 cf, Depth= 0.00"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Depth= 0.00"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.00" for 10-YR event
 Inflow = 0.00 cfs @ 23.95 hrs, Volume= 4 cf
 Outflow = 0.00 cfs @ 23.95 hrs, Volume= 4 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.00" for 10-YR event
 Inflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf
 Outflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Subcatchment E-1: Northerly

Runoff = 0.01 cfs @ 15.12 hrs, Volume= 164 cf, Depth= 0.10"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 140 cf, Depth= 0.10"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.10" for 25-YR event
 Inflow = 0.01 cfs @ 15.12 hrs, Volume= 164 cf
 Outflow = 0.01 cfs @ 15.12 hrs, Volume= 164 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.10" for 25-YR event
 Inflow = 0.00 cfs @ 15.12 hrs, Volume= 140 cf
 Outflow = 0.00 cfs @ 15.12 hrs, Volume= 140 cf, Atten= 0%, Lag= 0.0 min

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

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0 Annette Lane
 Type III 24-hr 100-YR Rainfall=8.94"

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Summary for Subcatchment E-1: Northerly

Runoff = 0.12 cfs @ 12.25 hrs, Volume= 1,119 cf, Depth= 0.66"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
20,298	30	Woods, Good, HSG A
20,298		100.00% Pervious Area

Summary for Subcatchment E-2: Southerly

Runoff = 0.11 cfs @ 12.25 hrs, Volume= 953 cf, Depth= 0.66"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
17,281	30	Woods, Good, HSG A
17,281		100.00% Pervious Area

Summary for Reach SP-1: STUDY POINT

Inflow Area = 20,298 sf, 0.00% Impervious, Inflow Depth = 0.66" for 100-YR event
 Inflow = 0.12 cfs @ 12.25 hrs, Volume= 1,119 cf
 Outflow = 0.12 cfs @ 12.25 hrs, Volume= 1,119 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 17,281 sf, 0.00% Impervious, Inflow Depth = 0.66" for 100-YR event
 Inflow = 0.11 cfs @ 12.25 hrs, Volume= 953 cf
 Outflow = 0.11 cfs @ 12.25 hrs, Volume= 953 cf, Atten= 0%, Lag= 0.0 min

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

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0 Annette Lane
 Multi-Event Tables

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Events for Subcatchment E-1: Northerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	4	0.00
25-YR	6.22	0.01	164	0.10
100-YR	8.94	0.12	1,119	0.66

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Multi-Event Tables
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Events for Subcatchment E-2: Southerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	3	0.00
25-YR	6.22	0.00	140	0.10
100-YR	8.94	0.11	953	0.66

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Multi-Event Tables
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Events for Reach SP-1: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	4
25-YR	0.01	0.01	164
100-YR	0.12	0.12	1,119

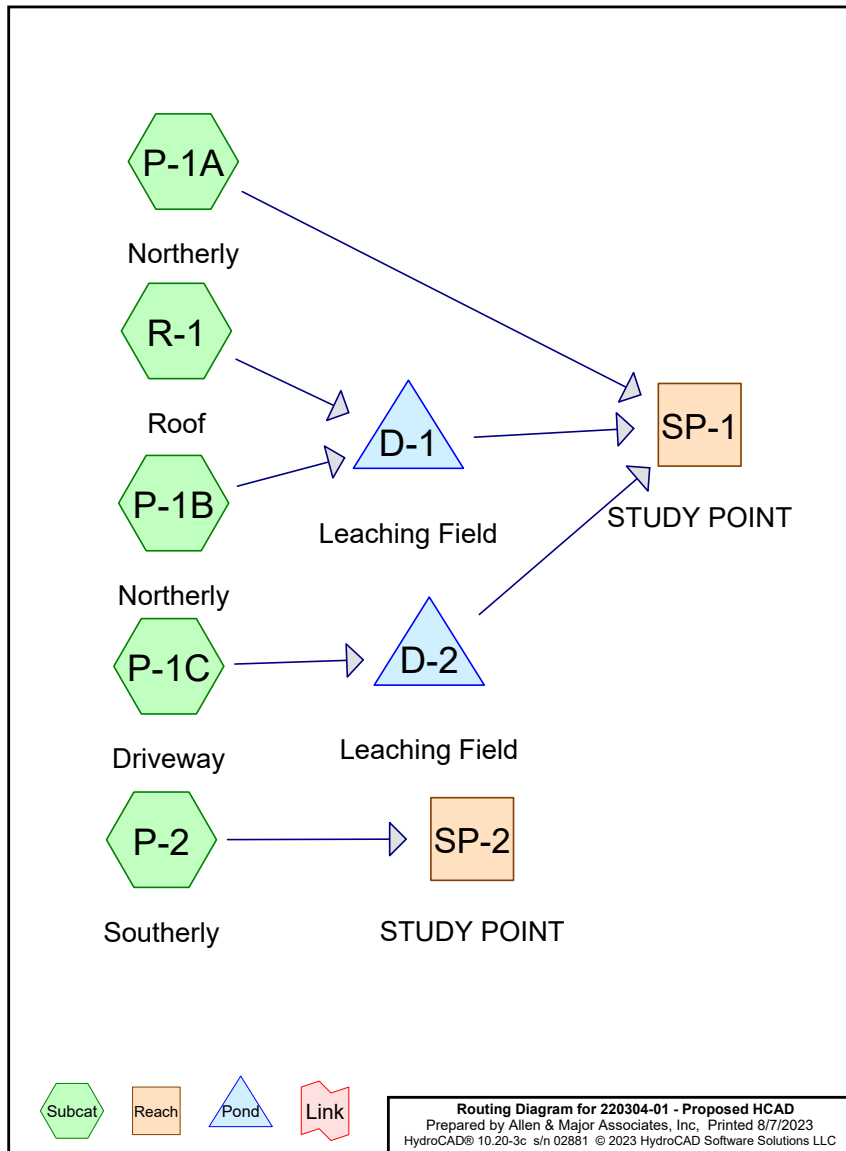
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Multi-Event Tables
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Events for Reach SP-2: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	3
25-YR	0.00	0.00	140
100-YR	0.11	0.11	953



220304-01 - Proposed HCAD

Prepared by Allen & Major Associates, Inc
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0 Annette Lane
 Type III 24-hr 2-YR Rainfall=3.22"
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Summary for Subcatchment P-1A: Northerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.17 cfs @ 12.10 hrs, Volume= 610 cf, Depth= 2.99"
 Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
2,451	98	Driveway
2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	Pipe Channel, D-E 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.14 cfs @ 12.00 hrs, Volume= 418 cf, Depth= 2.99"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2-YR Rainfall=3.22"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.00" for 2-YR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YR event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 0.55" for 2-YR event
 Inflow = 0.14 cfs @ 12.00 hrs, Volume= 418 cf
 Outflow = 0.01 cfs @ 12.77 hrs, Volume= 418 cf, Atten= 91%, Lag= 45.9 min
 Discarded = 0.01 cfs @ 12.77 hrs, Volume= 418 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 92.50' @ 12.77 hrs Surf.Area= 498 sf Storage= 194 cf

Plug-Flow detention time= 194.5 min calculated for 418 cf (100% of inflow)
 Center-of-Mass det. time= 194.5 min (945.2 - 750.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	15.50'W x 10.00'L x 4.75'H Field A 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	Shea Leaching Chamber 4x4x4 x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	91.50'	196 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#5	98.00'	590 cf	2.00'W x 370.00'L x 2.00'H Stone Trench 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	6.0" Round Pipe Storage Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	91.50'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	99.94'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.77 hrs HW=92.50' (Free Discharge)
 ↕ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
 ↕ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf, 100.00% Impervious, Inflow Depth = 2.99" for 2-YR event
 Inflow = 0.17 cfs @ 12.10 hrs, Volume= 610 cf
 Outflow = 0.02 cfs @ 11.65 hrs, Volume= 610 cf, Atten= 89%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.65 hrs, Volume= 610 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 96.45' @ 12.75 hrs Surf.Area= 409 sf Storage= 203 cf

Plug-Flow detention time= 72.4 min calculated for 610 cf (100% of inflow)
 Center-of-Mass det. time= 72.4 min (829.4 - 757.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	15.75'W x 25.98'L x 3.50'H Field A 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	ADS_StormTech SC-740 +Cap x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	100.33'	371 cf	Custom Stage Data (Irregular) Listed below (Recalc) -Impervious
#5	96.33'	36 cf	24.0" Round Pipe Storage -Impervious L= 11.5'
1,231 cf Total Available Storage			

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	95.33'	2.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	101.00'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.65 hrs HW=95.40' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment P-1A: Northerly

Runoff = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Depth= 0.00"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.00 cfs @ 14.63 hrs, Volume= 74 cf, Depth= 0.12"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.26 cfs @ 12.10 hrs, Volume= 950 cf, Depth= 4.65"
 Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
* 2,451	98	Driveway
2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	Pipe Channel, D-E 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.00 cfs @ 22.99 hrs, Volume= 8 cf, Depth= 0.01"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.21 cfs @ 12.00 hrs, Volume= 651 cf, Depth= 4.65"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10-YR Rainfall=4.89"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.00" for 10-YR event
 Inflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf
 Outflow = 0.00 cfs @ 23.95 hrs, Volume= 3 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.01" for 10-YR event
 Inflow = 0.00 cfs @ 22.99 hrs, Volume= 8 cf
 Outflow = 0.00 cfs @ 22.99 hrs, Volume= 8 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 0.95" for 10-YR event
 Inflow = 0.21 cfs @ 12.00 hrs, Volume= 725 cf
 Outflow = 0.02 cfs @ 12.00 hrs, Volume= 725 cf, Atten= 93%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 12.00 hrs, Volume= 725 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 95.61' @ 13.08 hrs Surf.Area= 655 sf Storage= 319 cf

Plug-Flow detention time= 239.3 min calculated for 725 cf (100% of inflow)
 Center-of-Mass det. time= 239.4 min (1,013.5 - 774.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	15.50'W x 10.00'L x 4.75'H Field A 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	Shea Leaching Chamber 4x4x4 x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	91.50'	196 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#5	98.00'	590 cf	2.00'W x 370.00'L x 2.00'H Stone Trench 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	6.0" Round Pipe Storage Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	91.50'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	99.94'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 12.00 hrs HW=94.29' (Free Discharge)
 ↕ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
 ↕ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf, 100.00% Impervious, Inflow Depth = 4.65" for 10-YR event
 Inflow = 0.26 cfs @ 12.10 hrs, Volume= 950 cf
 Outflow = 0.02 cfs @ 11.20 hrs, Volume= 950 cf, Atten= 93%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.20 hrs, Volume= 950 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 96.97' @ 13.24 hrs Surf.Area= 409 sf Storage= 367 cf

Plug-Flow detention time= 144.0 min calculated for 950 cf (100% of inflow)
 Center-of-Mass det. time= 143.9 min (893.0 - 749.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	15.75'W x 25.98'L x 3.50'H Field A 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	ADS_StormTech SC-740 +Cap x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	100.33'	371 cf	Custom Stage Data (Irregular) Listed below (Recalc) -Impervious
#5	96.33'	36 cf	24.0" Round Pipe Storage -Impervious L= 11.5'
1,231 cf Total Available Storage			

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	95.33'	2.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	101.00'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.20 hrs HW=95.40' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment P-1A: Northerly

Runoff = 0.00 cfs @ 15.12 hrs, Volume= 119 cf, Depth= 0.10"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.02 cfs @ 12.28 hrs, Volume= 248 cf, Depth= 0.40"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.33 cfs @ 12.10 hrs, Volume= 1,222 cf, Depth= 5.98"
 Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
* 2,451	98	Driveway
2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	Pipe Channel, D-E 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.00 cfs @ 14.80 hrs, Volume= 116 cf, Depth= 0.13"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.27 cfs @ 12.00 hrs, Volume= 837 cf, Depth= 5.98"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25-YR Rainfall=6.22"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.05" for 25-YR event
 Inflow = 0.00 cfs @ 15.12 hrs, Volume= 119 cf
 Outflow = 0.00 cfs @ 15.12 hrs, Volume= 119 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.13" for 25-YR event
 Inflow = 0.00 cfs @ 14.80 hrs, Volume= 116 cf
 Outflow = 0.00 cfs @ 14.80 hrs, Volume= 116 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 1.43" for 25-YR event
 Inflow = 0.27 cfs @ 12.00 hrs, Volume= 1,086 cf
 Outflow = 0.02 cfs @ 11.90 hrs, Volume= 1,086 cf, Atten= 94%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 11.90 hrs, Volume= 1,086 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 97.67' @ 15.29 hrs Surf.Area= 655 sf Storage= 527 cf

Plug-Flow detention time= 366.6 min calculated for 1,085 cf (100% of inflow)
 Center-of-Mass det. time= 367.0 min (1,157.8 - 790.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	15.50'W x 10.00'L x 4.75'H Field A 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	Shea Leaching Chamber 4x4x4 x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	91.50'	196 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#5	98.00'	590 cf	2.00'W x 370.00'L x 2.00'H Stone Trench 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	6.0" Round Pipe Storage Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	91.50'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	99.94'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.90 hrs HW=94.26' (Free Discharge)
 ↕ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
 ↕ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf, 100.00% Impervious, Inflow Depth = 5.98" for 25-YR event
 Inflow = 0.33 cfs @ 12.10 hrs, Volume= 1,222 cf
 Outflow = 0.02 cfs @ 10.55 hrs, Volume= 1,222 cf, Atten= 94%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 10.55 hrs, Volume= 1,222 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 97.46' @ 13.86 hrs Surf.Area= 409 sf Storage= 520 cf

Plug-Flow detention time= 215.0 min calculated for 1,221 cf (100% of inflow)
 Center-of-Mass det. time= 214.9 min (960.3 - 745.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	15.75'W x 25.98'L x 3.50'H Field A 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	ADS_StormTech SC-740 +Cap x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	100.33'	371 cf	Custom Stage Data (Irregular) Listed below (Recalc) -Impervious
#5	96.33'	36 cf	24.0" Round Pipe Storage -Impervious L= 11.5'
1,231 cf Total Available Storage			

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	95.33'	2.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	101.00'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 10.55 hrs HW=95.40' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment P-1A: Northerly

Runoff = 0.09 cfs @ 12.25 hrs, Volume= 810 cf, Depth= 0.66"
 Routed to Reach SP-1 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
14,687	30	Woods, Good, HSG A
14,687		100.00% Pervious Area

Summary for Subcatchment P-1B: Northerly

Runoff = 0.21 cfs @ 12.03 hrs, Volume= 844 cf, Depth= 1.36"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
1,842	30	Woods, Good, HSG A
5,615	39	>75% Grass cover, Good, HSG A
7,457	37	Weighted Average
7,457		100.00% Pervious Area

Summary for Subcatchment P-1C: Driveway

Runoff = 0.47 cfs @ 12.10 hrs, Volume= 1,777 cf, Depth= 8.70"
 Routed to Pond D-2 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
* 2,451	98	Driveway
2,451		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.8	38	0.2200	0.17		Sheet Flow, A-B Woods: Light underbrush n= 0.400 P2= 3.16"
0.3	12	0.0100	0.68		Sheet Flow, B-C Smooth surfaces n= 0.011 P2= 3.16"
2.1	250	0.0100	2.03		Shallow Concentrated Flow, C-D Paved Kv= 20.3 fps
0.6	278	0.0290	8.08	4.41	Pipe Channel, D-E 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.011 Concrete pipe, straight & clean

6.8 578 Total

Summary for Subcatchment P-2: Southerly

Runoff = 0.08 cfs @ 12.22 hrs, Volume= 670 cf, Depth= 0.75"
 Routed to Reach SP-2 : STUDY POINT

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
9,907	30	Woods, Good, HSG A
761	39	>75% Grass cover, Good, HSG A
10,668	31	Weighted Average
10,668		100.00% Pervious Area

Summary for Subcatchment R-1: Roof

Runoff = 0.39 cfs @ 12.00 hrs, Volume= 1,218 cf, Depth= 8.70"
 Routed to Pond D-1 : Leaching Field

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
 Type III 24-hr 100-YR Rainfall=8.94"

Area (sf)	CN	Description
1,680	98	Unconnected roofs, HSG A
1,680		100.00% Impervious Area
1,680		100.00% Unconnected

Summary for Reach SP-1: STUDY POINT

Inflow Area = 26,275 sf, 15.72% Impervious, Inflow Depth = 0.37" for 100-YR event
 Inflow = 0.09 cfs @ 12.25 hrs, Volume= 810 cf
 Outflow = 0.09 cfs @ 12.25 hrs, Volume= 810 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP-2: STUDY POINT

Inflow Area = 10,668 sf, 0.00% Impervious, Inflow Depth = 0.75" for 100-YR event
 Inflow = 0.08 cfs @ 12.22 hrs, Volume= 670 cf
 Outflow = 0.08 cfs @ 12.22 hrs, Volume= 670 cf, Atten= 0%, Lag= 0.0 min

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

Summary for Pond D-1: Leaching Field

Inflow Area = 9,137 sf, 18.39% Impervious, Inflow Depth = 2.71" for 100-YR event
 Inflow = 0.59 cfs @ 12.01 hrs, Volume= 2,062 cf
 Outflow = 0.03 cfs @ 12.10 hrs, Volume= 2,061 cf, Atten= 94%, Lag= 5.4 min
 Discarded = 0.03 cfs @ 12.10 hrs, Volume= 2,061 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 99.34' @ 15.09 hrs Surf.Area= 1,395 sf Storage= 1,018 cf

Plug-Flow detention time= 387.9 min calculated for 2,061 cf (100% of inflow)
 Center-of-Mass det. time= 387.6 min (1,191.1 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	94.20'	145 cf	15.50'W x 10.00'L x 4.75'H Field A 736 cf Overall - 374 cf Embedded = 362 cf x 40.0% Voids
#2A	94.70'	278 cf	Shea Leaching Chamber 4x4x4 x 6 Inside #1 Inside= 42.2"W x 45.0"H => 13.25 sf x 3.50'L = 46.4 cf Outside= 54.0"W x 51.0"H => 15.58 sf x 4.00'L = 62.3 cf 6 Chambers in 3 Rows
#3	98.95'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	91.50'	196 cf	Custom Stage Data (Irregular) Listed below (Recalc)
#5	98.00'	590 cf	2.00'W x 370.00'L x 2.00'H Stone Trench 1,480 cf Overall - 4 cf Embedded = 1,476 cf x 40.0% Voids
#6	98.50'	4 cf	6.0" Round Pipe Storage Inside #5 L= 20.0'
		1,216 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
91.50	0	0.0	0	0	0
92.00	185	59.4	31	31	281
92.50	500	500.0	165	196	19,895

Device	Routing	Invert	Outlet Devices
#0	Primary	100.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	91.50'	1.020 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	99.94'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 12.10 hrs HW=98.12' (Free Discharge)
 ↕ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=91.50' (Free Discharge)
 ↕ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Type III 24-hr 100-YR Rainfall=8.94"

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Summary for Pond D-2: Leaching Field

Inflow Area = 2,451 sf, 100.00% Impervious, Inflow Depth = 8.70" for 100-YR event
 Inflow = 0.47 cfs @ 12.10 hrs, Volume= 1,777 cf
 Outflow = 0.02 cfs @ 9.40 hrs, Volume= 1,777 cf, Atten= 96%, Lag= 0.0 min
 Discarded = 0.02 cfs @ 9.40 hrs, Volume= 1,777 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
 Routed to Reach SP-1 : STUDY POINT

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 9
 Peak Elev= 100.87' @ 15.05 hrs Surf.Area= 409 sf Storage= 882 cf

Plug-Flow detention time= 380.4 min calculated for 1,776 cf (100% of inflow)
 Center-of-Mass det. time= 380.5 min (1,121.1 - 740.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	95.33'	407 cf	15.75'W x 25.98'L x 3.50'H Field A 1,432 cf Overall - 413 cf Embedded = 1,019 cf x 40.0% Voids
#2A	96.33'	413 cf	ADS_StormTech SC-740 +Cap x 9 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 9 Chambers in 3 Rows
#3	99.33'	3 cf	2.00'D x 1.00'H Frame & Grate -Impervious
#4	100.33'	371 cf	Custom Stage Data (Irregular) Listed below (Recalc) -Impervious
#5	96.33'	36 cf	24.0" Round Pipe Storage -Impervious L= 11.5'
1,231 cf Total Available Storage			

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
100.33	0	0.0	0	0	0
101.00	185	59.4	41	41	281
102.00	500	500.0	330	371	19,897

Device	Routing	Invert	Outlet Devices
#0	Primary	102.00'	Automatic Storage Overflow (Discharged without head)
#1	Discarded	95.33'	2.040 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	101.00'	20.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 9.40 hrs HW=95.40' (Free Discharge)
 ↳ **1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.33' (Free Discharge)
 ↳ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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Multi-Event Tables

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Events for Subcatchment P-1A: Northerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	3	0.00
25-YR	6.22	0.00	119	0.10
100-YR	8.94	0.09	810	0.66

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Events for Subcatchment P-1B: Northerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	74	0.12
25-YR	6.22	0.02	248	0.40
100-YR	8.94	0.21	844	1.36

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Events for Subcatchment P-1C: Driveway

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.17	610	2.99
10-YR	4.89	0.26	950	4.65
25-YR	6.22	0.33	1,222	5.98
100-YR	8.94	0.47	1,777	8.70

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Events for Subcatchment P-2: Southerly

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.00	0	0.00
10-YR	4.89	0.00	8	0.01
25-YR	6.22	0.00	116	0.13
100-YR	8.94	0.08	670	0.75

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Events for Subcatchment R-1: Roof

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-YR	3.22	0.14	418	2.99
10-YR	4.89	0.21	651	4.65
25-YR	6.22	0.27	837	5.98
100-YR	8.94	0.39	1,218	8.70

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Events for Reach SP-1: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	3
25-YR	0.00	0.00	119
100-YR	0.09	0.09	810

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Events for Reach SP-2: STUDY POINT

Event	Inflow (cfs)	Outflow (cfs)	Volume (cubic-feet)
2-YR	0.00	0.00	0
10-YR	0.00	0.00	8
25-YR	0.00	0.00	116
100-YR	0.08	0.08	670

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Events for Pond D-1: Leaching Field

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.14	0.01	0.01	0.00	0	92.50	194
10-YR	0.21	0.02	0.02	0.00	0	95.61	319
25-YR	0.27	0.02	0.02	0.00	0	97.67	527
100-YR	0.59	0.03	0.03	0.00	0	99.34	1,018

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Events for Pond D-2: Leaching Field

Event	Inflow (cfs)	Outflow (cfs)	Discarded (cfs)	Primary (cfs)	Volume (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
2-YR	0.17	0.02	0.02	0.00	0	96.45	203
10-YR	0.26	0.02	0.02	0.00	0	96.97	367
25-YR	0.33	0.02	0.02	0.00	0	97.46	520
100-YR	0.47	0.02	0.02	0.00	0	100.87	882

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.103 degrees West
Latitude	42.523 degrees North
Elevation	0 feet
Date/Time	Tue, 28 Apr 2020 15:58:00 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.42	0.53	0.69	0.86	1.09	1yr	0.74	1.03	1.27	1.62	2.08	2.68	2.94	1yr	2.37	2.82	3.26	3.95	4.61	1yr
2yr	0.34	0.53	0.66	0.87	1.09	1.38	2yr	0.94	1.26	1.60	2.02	2.55	3.22	3.56	2yr	2.85	3.42	3.93	4.67	5.32	2yr
5yr	0.41	0.63	0.80	1.06	1.36	1.74	5yr	1.18	1.58	2.02	2.56	3.23	4.08	4.53	5yr	3.62	4.36	4.98	5.93	6.68	5yr
10yr	0.46	0.72	0.91	1.24	1.61	2.07	10yr	1.39	1.88	2.42	3.07	3.88	4.89	5.45	10yr	4.33	5.24	5.96	7.10	7.93	10yr
25yr	0.54	0.86	1.10	1.51	2.00	2.60	25yr	1.73	2.36	3.06	3.90	4.94	6.22	6.95	25yr	5.50	6.68	7.55	9.03	9.96	25yr
50yr	0.61	0.98	1.25	1.76	2.37	3.12	50yr	2.05	2.81	3.68	4.70	5.94	7.45	8.35	50yr	6.60	8.03	9.04	10.82	11.85	50yr
100yr	0.70	1.13	1.46	2.06	2.81	3.72	100yr	2.42	3.35	4.39	5.63	7.12	8.94	10.05	100yr	7.91	9.67	10.82	12.98	14.09	100yr
200yr	0.80	1.30	1.68	2.41	3.33	4.44	200yr	2.87	3.98	5.26	6.76	8.55	10.73	12.11	200yr	9.50	11.64	12.97	15.58	16.77	200yr
500yr	0.96	1.57	2.05	2.98	4.17	5.61	500yr	3.60	5.02	6.68	8.60	10.90	13.66	15.48	500yr	12.09	14.89	16.47	19.83	21.12	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.25	0.38	0.46	0.63	0.77	0.87	1yr	0.66	0.85	1.15	1.41	1.74	2.42	2.34	1yr	2.15	2.25	2.75	3.51	4.12	1yr
2yr	0.33	0.51	0.62	0.84	1.04	1.24	2yr	0.90	1.21	1.43	1.89	2.43	3.07	3.40	2yr	2.72	3.27	3.77	4.49	5.14	2yr
5yr	0.38	0.59	0.73	1.00	1.28	1.49	5yr	1.10	1.46	1.70	2.20	2.82	3.64	4.08	5yr	3.22	3.93	4.50	5.36	6.08	5yr
10yr	0.43	0.65	0.81	1.13	1.46	1.71	10yr	1.26	1.67	1.94	2.48	3.16	4.11	4.66	10yr	3.63	4.48	5.13	6.12	6.91	10yr
25yr	0.49	0.75	0.93	1.32	1.74	2.03	25yr	1.50	1.99	2.30	2.90	3.69	4.79	5.57	25yr	4.24	5.35	6.11	7.25	8.18	25yr
50yr	0.54	0.83	1.03	1.48	1.99	2.33	50yr	1.72	2.28	2.62	3.27	4.14	5.36	6.40	50yr	4.74	6.15	6.99	8.22	9.30	50yr
100yr	0.61	0.92	1.15	1.67	2.29	2.65	100yr	1.97	2.59	2.98	3.69	4.65	5.97	7.39	100yr	5.29	7.10	8.02	9.32	10.59	100yr
200yr	0.68	1.03	1.30	1.89	2.63	3.03	200yr	2.27	2.96	3.38	4.15	5.24	6.62	8.55	200yr	5.86	8.22	9.20	10.52	12.07	200yr
500yr	0.80	1.19	1.53	2.23	3.17	3.60	500yr	2.73	3.52	4.01	4.87	6.13	7.54	10.44	500yr	6.67	10.04	11.06	12.28	14.32	500yr

Upper Confidence Limits

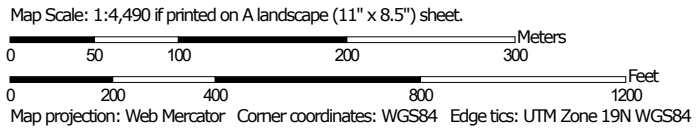
	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.30	0.47	0.57	0.77	0.95	1.11	1yr	0.82	1.08	1.29	1.72	2.20	2.85	3.24	1yr	2.52	3.12	3.54	4.28	5.06	1yr
2yr	0.35	0.55	0.67	0.91	1.13	1.33	2yr	0.97	1.30	1.54	2.03	2.61	3.38	3.75	2yr	2.99	3.61	4.13	4.94	5.57	2yr
5yr	0.44	0.68	0.85	1.16	1.48	1.74	5yr	1.27	1.70	2.02	2.61	3.32	4.51	5.05	5yr	3.99	4.85	5.56	6.57	7.33	5yr
10yr	0.54	0.83	1.02	1.43	1.85	2.14	10yr	1.59	2.09	2.48	3.17	4.00	5.62	6.33	10yr	4.98	6.09	6.95	8.23	9.02	10yr
25yr	0.70	1.06	1.32	1.88	2.48	2.81	25yr	2.14	2.75	3.27	4.09	5.10	7.57	8.55	25yr	6.70	8.22	9.32	11.04	11.89	25yr
50yr	0.84	1.28	1.60	2.30	3.09	3.46	50yr	2.67	3.39	4.04	4.97	6.14	9.51	10.72	50yr	8.41	10.30	11.59	13.82	14.65	50yr
100yr	1.03	1.56	1.95	2.82	3.87	4.26	100yr	3.34	4.16	4.99	6.04	7.39	11.95	13.40	100yr	10.58	12.89	14.45	17.35	18.07	100yr
200yr	1.25	1.89	2.39	3.46	4.83	5.25	200yr	4.17	5.13	6.18	7.33	8.88	15.05	16.74	200yr	13.32	16.10	18.02	21.80	22.31	200yr
500yr	1.64	2.43	3.13	4.55	6.47	6.91	500yr	5.58	6.76	8.20	9.49	11.36	20.44	22.44	500yr	18.09	21.58	24.12	29.49	29.43	500yr



Hydrologic Soil Group—Middlesex County, Massachusetts



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

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 misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 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 distance and area. A projection that preserves area, such as the 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 22, Sep 9, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6A	Scarboro mucky fine sandy loam, 0 to 3 percent slopes	A/D	14.4	14.1%
52A	Freetown muck, 0 to 1 percent slopes	B/D	4.0	3.9%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	A	10.8	10.6%
103C	Charlton-Hollis-Rock outcrop complex, 8 to 15 percent slopes	B	3.0	3.0%
104D	Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes	D	5.0	4.9%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	2.4	2.4%
420B	Canton fine sandy loam, 3 to 8 percent slopes	B	5.6	5.5%
422B	Canton fine sandy loam, 0 to 8 percent slopes, extremely stony	B	6.3	6.2%
424B	Canton fine sandy loam, 3 to 8 percent slopes, extremely bouldery	A	0.7	0.7%
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	A	46.1	45.0%
655	Udorthents, wet substratum		3.9	3.8%
Totals for Area of Interest			102.3	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Peter Seibold

Owner Name

0 Annette Land

Street Address

Reading

City

MA

State

Map 38 Lot 39

Map/Lot #

01867

Zip Code

B. Site Information

1. (Check one) New Construction Upgrade

2. Soil Survey NRCS Webpage 6A Scarborough mucky fine sandy loam
Source Soil Map Unit Soil Series

Outwash Terrace N/A
Landform Soil Limitations

Sandy glaciofluvial deposits derived from schist, gneiss and/or granite
Soil Parent material

3. Surficial Geological Report N/A N/A
Year Published/Source Map Unit

N/A
Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? Yes No

5. Within a velocity zone? Yes No

6. Within a Mapped Wetland Area? Yes No If yes, MassGIS Wetland Data Layer: N/A
Wetland Type

7. Current Water Resource Conditions (USGS): 6/18/2023 Range: Above Normal Normal Below Normal
Month/Day/ Year

8. Other references reviewed: N/A
(Zone II, IWPA, Zone A, EEA Data Portal, etc.)
 N/A



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-1 6/18/2023 9:00 am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100' feet Wetlands 57' feet
 Property Line 10' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : _____ Dpl: _____						
33-68"	B	Silty Loam	10YR 4/4		Cnc : _____ Dpl: _____		10%	10%			
68"+	Ledge				Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						

Additional Notes:
 No evidence of ESHGT. Refusal @ 68".



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-2 6/18/2023 9:00am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use: Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100" feet Wetlands 63' feet
 Property Line 10' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2	Cnc :							
				Dpl:							
6-34"	B	Silty Loam	10YR 4/4	Cnc :							
				Dpl:							
34-69"	C	Loamy Sand	10YR 4/4	Cnc :							
				Dpl:							
69"+	Ledge			Cnc :							
				Dpl:							
				Cnc :							
				Dpl:							

Additional Notes:
 No evidence of ESHGT. Refusal @ 69"



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-3 6/18/2023 9:00 am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100' feet Wetlands 47' feet
 Property Line 40' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-28"	A	Sandy Loam	10YR 3/2		Cnc : _____ Dpl: _____						
28-34"	B	Silty Loam	10YR 4/4		Cnc : _____ Dpl: _____		10%	10%			
34"+	Ledge				Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						

Additional Notes:
 No evidence of ESHGT. Refusal @ 34".



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-4 6/18/2023 9:00am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use: Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100" feet Wetlands 43' feet
 Property Line 84' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole 70 Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-29"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
29-72"	C	Loamy Sand	10YR 5/2	66	Cnc : Dpl: 7.5TR 3/4						
72"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
 ESHGT = 66". Refusal @ 72"



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-5 6/18/2023 9:00 am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100' feet Wetlands 52' feet
 Property Line 59' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : _____ Dpl: _____						
6-28"	B	Silty Loam	10YR 4/4		Cnc : _____ Dpl: _____		10%	10%			
28-34"	C	Sand	2.5Y 5/2		Cnc : _____ Dpl: _____						
34"+	Ledge				Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						

Additional Notes:
 No evidence of ESHGT. Refusal @ 34".



**Commonwealth of Massachusetts
City/Town of Reading**

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area*)

Deep Observation Hole Number: TP-6 6/18/2023 9:00am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use: Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100" feet Wetlands 60' feet
 Property Line 87' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-14"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
14-28"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
28-76"	C	Loamy Sand	10YR 5/2		Cnc : Dpl:						
76"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
 No evidence of ESHGT. Refusal @ 76".



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-7 6/18/2023 9:00 am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits
Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100' feet Wetlands 34' feet
 Property Line 59' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth to Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : _____ Dpl: _____						
6-32"	B	Silty Loam	10YR 4/4		Cnc : _____ Dpl: _____		10%	10%			
32-69"	C	Sand	2.5Y 4/4		Cnc : _____ Dpl: _____						
69"+	Ledge				Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						
					Cnc : _____ Dpl: _____						

Additional Notes:
 No evidence of ESHGT. Refusal @ 69".



Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-8 6/18/2023 9:00am Sunny N/A N/A
Hole # Date Time Weather Latitude Longitude

1. Land Use: Woodland Trees/Brush Boulders/Ledge Outcrops 5-15%
(e.g., woodland, agricultural field, vacant lot, etc.) Vegetation Surface Stones (e.g., cobbles, stones, boulders, etc.) Slope (%)
 Description of Location: Woods

2. Soil Parent Material: Sandy glaciofluvial deposits Landform Position on Landscape (SU, SH, BS, FS, TS, Plain)

3. Distances from: Open Water Body >100' feet Drainage Way >100" feet Wetlands 40' feet
 Property Line 38' feet Drinking Water Well N/A feet Other N/A feet

4. Unsuitable Materials Present: Yes No If Yes: Disturbed Soil/Fill Material Weathered/Fractured Rock Bedrock

5. Groundwater Observed: Yes No If yes: _____ Depth to Weeping in Hole _____ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA)	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-6"	A	Sandy Loam	10YR 3/2		Cnc : Dpl:						
6-36"	B	Silty Loam	10YR 4/4		Cnc : Dpl:						
36-44"	B2	Loamy Sand	10YR 3/1		Cnc : Dpl:						
44-88"	C	Loamy Sand	10YR 6/2		Cnc : Dpl:						
88"+	Ledge				Cnc : Dpl:						
					Cnc : Dpl:						

Additional Notes:
 No evidence of ESHGT. Refusal @ 88".



LEGEND:

- WETLAND FLAG (BY LEC ENVIRONMENTAL)
- EOR EDGE OF ROAD
- BSW BACK OF SIDEWALK
- CONIFEROUS TREE (>6" DIA.)
- DECIDUOUS TREE (>6" DIA.)
- WATER GATE
- TWO FOOT CONTOUR
- PROPOSED POWER POLE

ZONING TABLE				
S-20 DISTRICT	REQUIRED	EXISTING	PROPOSED LOT B-1	PROPOSED ROW EXTENSION
LOT SIZE	20,000 SQ. FT.	54,942 ± SQ. FT.	43,740± SQ. FT.	11,201± SQ. FT.
FRONTAGE	120.00'	50.03'	186.06'	---
MINIMUM LOT WIDTH	80.00'	186.06'	186.06'	---
MINIMUM FRONT SETBACK	20.0'	---	94.8'	---
MINIMUM SIDE SETBACK	15.0'	---	54.4'	---
MINIMUM REAR SETBACK	20.0'	---	106.3'	---
MAX. LOT COVERAGE	25%	---	3.8%	---
HEIGHT	35'	---	LESS THAN 35'	---
WETLAND AREA		17,357± SQ. FT.	7,084± SQ. FT.	5,634± SQ. FT.
UPLAND AREA		37,585± SQ. FT.	36,656± SQ. FT.	5,567± SQ. FT.

TOTAL IMPERVIOUS AREA LOT B-1
3,407 SF/7.8%

OWNER OF RECORD
PETER SEIBOLD
437 SUMMER AVE., READING, MA
DEED BOOK 30698 PAGE 582

NOTES
STORMWATER INFILTRATION SYSTEM TO CONSIST OF CULTEC 280HD CHAMBERS, OR SIMILAR, DESIGNED TO CAPTURE 100% OF IMPERVIOUS AREAS.

ZONING DISTRICT
TAX MAP 38 PARCEL 139
S-20 DISTRICT

PROPOSED DRIVEWAY CONSTRUCTION TO MEET ACCEPTED STANDARDS IN JUDGEMENT OF THE TOWN ENGINEER TO ACCOMMODATE PRIVATE AUTOMOBILES, SERVICE VEHICLES, AND EMERGENCY VEHICLES.

PLAN REFERENCES
PLAN NO. 1478 OF 1985
PLAN NO. 640 OF 1967

I HEREBY CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY.

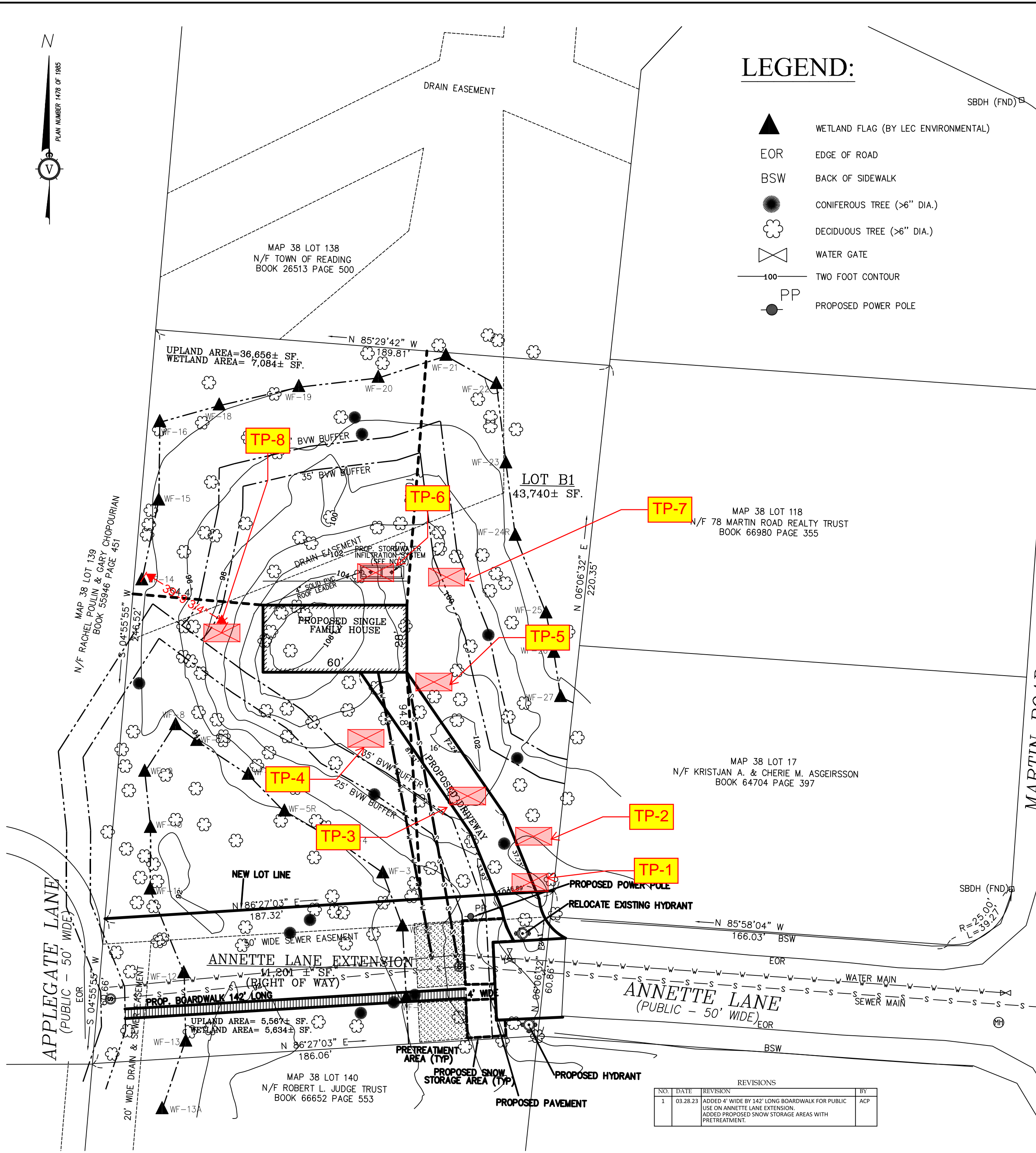
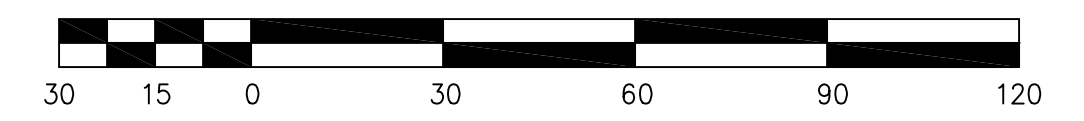
JAMES J. ABELY P.L.S. DATE

PRELIMINARY SUBDIVISION PLAN

ANNETTE LANE
READING, MA

SCALE 1" = 30' FEBRUARY 20, 2023
REVISED MARCH 28, 2023
PREPARED BY

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REVISIONS			
NO.	DATE	REVISION	BY
1	03.28.23	ADDED 4' WIDE BY 142' LONG BOARDWALK FOR PUBLIC USE ON ANNETTE LANE EXTENSION. ADDED PROPOSED SNOW STORAGE AREAS WITH PRETREATMENT.	ACP