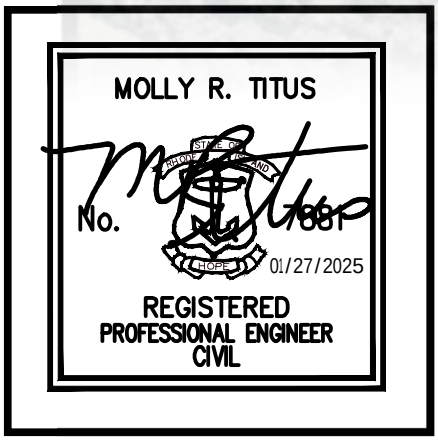
DiPrete Engineering

Stormwater Management Report



Saugatucket Acres

Located in South Kingstown, Rhode Island

Applicant: JAE Mills, LLC

01-27-2025

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Executive Summary

On behalf of the Client, we are submitting drainage calculations for the proposed development at 176 Saugatucket Road in South Kingstown. The site is located on Assessors' Plat 42 Lot 9. The site exists today with a single residence and contains wetlands on the southern and eastern side of the property. The client proposes to demolish the existing home, barn, and driveway, and then divide the site into five single-family lots with a shared driveway. The proposed lots will be serviced by on-site wastewater treatment systems and public water.

The post development stormwater will be treated for water quality using Best Management Practices (BMPs). The Site has been designed to meet the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM). Site constraints include wetlands to the east and south, and high groundwater tables.

To mitigate post development flows on site, a series of drywells, swales are utilized to convey runoff to infiltration basins. The infiltration systems are designed to control runoff for the 2 through 100-year storm events. The drywells and water quality infiltration areas are designed as water quality BMPs. These will remove 85% or more of TSS (total suspended solids) generated by the proposed roofs and driveways.

This report details how the site will show no net increase in stormwater runoff from pre-development to post development conditions, and how the proposed BMPs will provide water quality treatment for stormwater runoff.

Pre-development Conditions versus Post Development Conditions Flow Rates for each watershed are summarized below:

Subwatershed (design point)	**1-yr Peak Flow**		**2-yr Peak Flow**		**10-yr Peak Flow**		**25-yr Peak Flow**		**100-yr Peak Flow**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
DP-1: Saugatucket Road	0.07	0.09	0.11	0.13	0.23	0.25	0.34	0.35	0.55	0.54
DP-2: Wetland A	1.67	1.47	2.67	2.10	6.52	4.88	9.80	8.90	16.87	16.52
Totals:	1.74	1.56	2.78	2.23	6.75	5.13	10.14	9.25	17.42	17.06

All flows in cubic feet per second (cfs)

APPENDIX A: STORMWATER MANAGEMENT PLAN CHECKLIST AND LID PLANNING REPORT – STORMWATER DESIGN SUMMARY

PROJECT NAME **Saugatucket Acres**	**(RIDEM USE ONLY)** **STW/WQC File #:** **Date Received:**
TOWN **South Kingstown**	
BRIEF PROJECT DESCRIPTION: 5 lot residential subdivision with shared access drive, public water, and private OWTS	

Stormwater Management Plan (SMP) Elements – Minimum Standards

When submitting a SMP,[1] submit four separately bound documents: Appendix A Checklist; Stormwater Site Planning, Analysis and Design Report with Plan Set/Drawings; Soil Erosion and Sediment Control (SESC) Plan, and Post Construction Operations and Maintenance (O&M) Plan. Please refer to Suggestions to Promote Brevity.

Note: **All stormwater construction projects must create a Stormwater Management Plan (SMP). However, not every element listed below is required per the RIDEM Stormwater Rules and the RIPDES Construction General Permit (CGP). This checklist will help identify the required elements to be submitted with an Application for Stormwater Construction Permit & Water Quality Certification.**

PART 1. PROJECT AND SITE INFORMATION

PROJECT TYPE (Check all that apply)

☒ Residential	☐ Commercial	☐ Federal	☐ Retrofit	☐ Restoration
☐ Road	☐ Utility	☐ Fill	☐ Dredge	☐ Mine
☐ Other (specify):				

SITE INFORMATION

☒ Vicinity Map

INITIAL DISCHARGE LOCATION(S): The WQv discharges to: (You may choose more than one answer if several discharge points are associated with the project.)

☐ **Groundwater**	☐ **Surface Water**	☐ **MS4**
☐ GAA	☐ Isolated Wetland	☐ RIDOT
☒ GA	☐ Named Waterbody	☐ RIDOT Alteration Permit is Approved
☐ GB	☒ Unnamed Waterbody Connected to Named Waterbody	☐ Town
		☐ Other (specify):

ULTIMATE RECEIVING WATERBODY LOCATION(S): Include pertinent information that applies to both WQ_v and flow from larger storm events including overflows. Choose all that apply, and repeat table for each waterbody.

☐ Groundwater or Disconnected Wetland	☐ SRWP		
☒ Waterbody Name: Indian Run Brook	☐ Coldwater	☒ Warmwater	☐ Unassessed
☒ Waterbody ID: RI10010045R-02	☐ 4th order stream of pond 50 acres or more		
☒ TMDL for: Fecal Coliform, Copper, Zinc	☐ Watershed of flood prone river (e.g., Pocasset River)		
☐ Contributes to a priority outfall listed in the TMDL	☐ Contributes stormwater to a public beach		
☒ 303(d) list – Impairment(s) for: Fecal Coliform, Copper, Zinc	☐ Contributes to shellfishing grounds		

[1] Applications for a Construction General Permit that do not require any other permits from RIDEM and will disturb less than 5 acres over the entire course of the project do not need to submit a SMP. The Appendix A checklist must still be submitted.

PROJECT HISTORY		
☐ RIDEM Pre- Application Meeting	Meeting Date:	☐ Minutes Attached
☐ Municipal Master Plan Approval	Approval Date:	☐ Minutes Attached
☐ Subdivision Suitability Required	Approval #:	
☐ Previous Enforcement Action has been taken on the property	Enforcement #:	

FLOODPLAIN & FLOODWAY See Guidance Pertaining to Floodplain and Floodways	
☐ Riverine 100-year floodplain: **FEMA FLOODPLAIN FIRMETTE** has been reviewed and the 100-year floodplain is on site	
☒ Delineated from FEMA Maps: 44009C0203K and 44009C024K	
NOTE: Per Rule 250-RICR-150-10-8-1.1(B)(5)(d)(3), provide volumetric floodplain compensation calculations for cut and fill/displacement calculated by qualified professional	
☐ Calculated by Professional Engineer	
☐ Calculations are provided for cut vs. fill/displacement volumes proposed within the 100-year floodplain	Amount of Fill (CY): Amount of Cut (CY):
☐ Restrictions or modifications are proposed to the flow path or velocities in a floodway	
☐ Floodplain storage capacity is impacted	
☒ Project area is not within 100-year floodplain as defined by RIDEM	

CRMC JURISDICTION
☐ CRMC Assent required
☐ Property subject to a Special Area Management Plan (SAMP). If so, specify which SAMP:
☐ Sea level rise mitigation has been designed into this project

LUHPPL IDENTIFICATION - MINIMUM STANDARD 8:			
1. OFFICE OF Land Revitalization and Sustainable Materials Management (OLRSMM)			
	☐ Known or suspected releases of HAZARDOUS MATERIAL are present at the site (Hazardous Material is defined in Rule 1.4(A)(33) of 250-140-30-1 of the RIDEM Rules and Regulations for Investigation and Remediation of Hazardous Materials (the Remediation Regulations))		**RIDEM CONTACT:**
	☐ Known or suspected releases of PETROLEUM PRODUCT are present at the site (Petroleum Product as defined in Rule 1.5(A)(84) of 250-140-25-1 of the RIDEM Rules and Regulations for Underground Storage Facilities Used for Regulated Substances and Hazardous Materials)		
	☐ This site is identified on the RIDEM Environmental Resources Map as one of the following regulated facilities		**SITE ID#:**
		☐ CERCLIS/Superfund (NPL)	
		☐ State Hazardous Waste Site (SHWS)	
		☐ Environmental Land Usage Restriction (ELUR)	
		☐ Leaking Underground Storage Tank (LUST)	
		☐ Closed Landfill	
Note: If any boxes in 1 above are checked, the applicant must contact the RIDEM OLRSMM Project Manager associated with the Site to determine if subsurface infiltration of stormwater is allowable for the project. Indicate if the infiltration corresponds to "Red," "Yellow" or "Green" as described in Section 3.2.8 of the RISDISM Guidance (Subsurface Contamination Guidance). Also, note and reference approval in PART 3, Minimum Standard 2: Groundwater Recharge/Infiltration.			
2. PER MINIMUM STANDARD 8 of RICR 8.14.C.1-6 "LUHPPLS," THE SITE IS/HAS:			
	☐ Industrial Site with RIPDES MSGP, except where No Exposure Certification exists. http://www.dem.ri.gov/programs/water/permits/ripdes/stormwater/status.php		
	☐ Auto Fueling Facility (e.g., gas station)		
	☐ Exterior Vehicles Service, Maintenance, or Equipment Cleaning Area		

	☐ Road Salt Storage and Loading Areas (exposed to rainwater)	
	☐ Outdoor Storage and Loading/Unloading of Hazardous Substances	
3.	**STORMWATER INDUSTRIAL PERMITTING**	
	☐ The site is associated with existing or proposed activities that are considered Land Uses with Higher Potential Pollutant Loads (LUHPPLS) (see RICR 8.14.C)	Activities: Sector:
	☐ Construction is proposed on a site that is subject to THE MULTI-SECTOR GENERAL PERMIT (MSGP) UNDER RULE 31(B)15 OF THE RIPDES REGULATIONS.	MSGP permit #
	☐ Additional stormwater treatment is required by the MSGP Explain:	

REDEVELOPMENT STANDARD – MINIMUM STANDARD 6		
☐ Pre Construction Impervious Area		
	☐ Total Pre-Construction Impervious Area (**TIA**) = 0.128 ac	
	☐ Total Site Area (**TSA**) = 9.376 ac	
	☐ Jurisdictional Wetlands (**JW**) = 5.798 ac	
	☐ Conservation Land (**CL**) = 0.0 ac	
☐ Calculate the Site Size (defined as contiguous properties under same ownership)		
	☐ Site Size (**SS**) = (**TSA**) – (**JW**) – (**CL**) = 3.578 ac	
	☐ (**TIA**) / (**SS**) = 0.035	☐ (**TIA**) / (**SS**) >**0.4**? No
☐ YES, Redevelopment		

PART 2. LOW IMPACT DEVELOPMENT ASSESSMENT – MINIMUM STANDARD 1

(NOT REQUIRED FOR REDEVELOPMENT OR RETROFITS)

This section may be deleted if not required.

Note: A written description must be provided specifying why each method is not being used or is not applicable at the Site. Appropriate answers may include:

- Town requires … (state the specific local requirement)
- Meets Town's dimensional requirement of …
- Not practical for site because …
- Applying for waiver/variance to achieve this (pending/approved/denied)
- Applying for wavier/variance to seek relief from this (pending/approved/denied)

A) PRESERVATION OF UNDISTURBED AREAS, BUFFERS, AND FLOODPLAINS	**IF NOT IMPLEMENTED, EXPLAIN HERE**
☒ Sensitive resource areas and site constraints are identified (required) ☒ Local development regulations have been reviewed (required) ☒ All vegetated buffers and coastal and freshwater wetlands will be protected during and after construction ☐ Conservation Development or another site design technique has been incorporated to protect open space and pre-development hydrology. **Note:** If Conservation Development has been used, check box and skip to Subpart C ☒ As much natural vegetation and pre-development hydrology as possible has been maintained	

B) LOCATE DEVELOPMENT IN LESS SENSITIVE AREAS AND WORK WITH THE NATURAL LANDSCAPE CONDITIONS, HYDROLOGY, AND SOILS ☒ Development sites and building envelopes have been appropriately distanced from wetlands and waterbodies ☐ Development and stormwater systems have been located in areas with greatest infiltration capacity (e.g., soil groups A and B) ☐ Plans show measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPA's) ☒ Development sites and building envelopes have been positioned outside of floodplains ☒ Site design positions buildings, roadways and parking areas in a manner that avoids impacts to surface water features ☒ Development sites and building envelopes have been located to minimize impacts to steep slopes (≥15%) ☐ Other (describe):	The entire site has soils with HSG C. The potential use of QPAs were evaluated, but due to the limited space and the size of the houses, drywells were determined to be more appropriate.
C) MINIMIZE CLEARING AND GRADING ☒ Site clearing has been restricted to minimum area needed for building footprints, development activities, construction access, and safety. ☒ Site has been designed to position buildings, roadways, and parking areas in a manner that minimizes grading (cut and fill quantities) ☒ Protection for stands of trees and individual trees and their root zones to be preserved has been specified, and such protection extends at least to the tree canopy drip line(s) ☒ Plan notes specify that public trees removed or damaged during construction shall be replaced with equivalent	
D) REDUCE IMPERVIOUS COVER ☒ Reduced roadway widths (≤22 feet for ADT ≤ 400; ≤ 26 feet for ADT 400 - 2,000) ☒ Reduced driveway areas (length minimized via reduced ROW width (≤ 45 ft.) and/or reduced (or absolute minimum) front yard setback; width minimized to ≤ 9 ft. wide one lane; ≤ 18 ft. wide two lanes; shared driveways; pervious surface) ☐ Reduced building footprint: Explain approach: ☒ Reduced sidewalk area (≤ 4 ft. wide; one side of the street; unpaved path; pervious surface) ☒ Reduced cul-de-sacs (radius < 45 ft; vegetated island; alternative turn-around) ☒ Reduced parking lot area: Explain approach ☐ Use of pervious surfaces for driveways, sidewalks, parking areas/overflow parking areas, etc. ☒ Minimized impervious surfaces (project meets or is less than maximum specified by Zoning Ordinance) ☐ Other (describe):	Impervious areas were minimized to the maximum extent practicable. A shared driveway is proposed rather than a ROW. No sidewalks, parking lots, or cul-de-sacs are proposed. The use of pervious pavement was examined as a BMP option. However, due to the high GWTs, the amount of fill that would be required was not practical.
E) DISCONNECT IMPERVIOUS AREA ☒ Impervious surfaces have been disconnected, and runoff has been diverted to QPAs to the maximum extent possible ☒ Residential street edges allow side-of-the-road drainage into vegetated open swales ☐ Parking lot landscaping breaks up impervious expanse AND accepts runoff ☐ Other (describe):	No parking lots are proposed. No closed drainage system is proposed. The proposed grading across the driveways will runoff in a similar way as it does today and reach Pond Complex A via overland flow.
F) MITIGATE RUNOFF AT THE POINT OF GENERATION ☒ Small-scale BMPs have been designated to treat runoff as close as possible to the source	

G) PROVIDE LOW-MAINTENANCE NATIVE VEGETATION ☒ Low-maintenance landscaping has been proposed using native species and cultivars ☒ Plantings of native trees and shrubs in areas previously cleared of native vegetation are shown on site plan ☒ Lawn areas have been limited/minimized, and yards have been kept undisturbed to the maximum extent practicable on residential lots	
H) RESTORE STREAMS/WETLANDS ☐ Historic drainage patterns have been restored by removing closed drainage systems, daylighting buried streams, and/or restoring degraded stream channels and/or wetlands ☐ Removal of invasive species ☐ Other	No invasive species observed. No closed drainage system is proposed.

PART 3. SUMMARY OF REMAINING STANDARDS

GROUNDWATER RECHARGE – MINIMUM STANDARD 2		
YES	**NO**	
☒	☐	The project has been designed to meet the groundwater recharge standard.
☐	☐	If "No," the justification for groundwater recharge criterion waiver has been explained in the Narrative (e.g., threat of groundwater contamination or physical limitation), if applicable (see RICR 8.8.D);
☐	☐	Your waiver request has been explained in the Narrative, if applicable.
☐	☒	Is this site identified as a Regulated Facility in Part 1, Minimum Standard 8: LUHPPL Identification?
☐	☐	If "Yes," has approval for infiltration by the OLRSMM Site Project Manager, per Part 1, Minimum Standard 8, been requested?

TABLE 2-1: Summary of Recharge (see RISDISM Section 3.3.2)
(Add or Subtract Rows as Necessary)

Design Point	**Impervious Area Treated (sq ft)**	**Total Re_v Required (cu ft)**	**LID Stormwater Credits (see RISDISM Section 4.6.1)**	**Recharge Required by Remaining BMPs (cu ft)**	**Recharge Provided by BMPs (cu ft)**
			Portion of Re_v directed to a QPA (cu ft)		
DP-1:	131	3	0	3	0
DP-2:	24,394	508	0	508	2,134
TOTALS:	24,524	511	0	511	2,134

Notes:
1. Only BMPs listed in RISDISM Table 3-5 "List of BMPs Acceptable for Recharge" may be used to meet the recharge requirement.
2. Recharge requirement must be satisfied for each waterbody ID.

☐ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):

WATER QUALITY – MINIMUM STANDARD 3		
YES	**NO**	
☒	☐	Does this project meet or exceed the required water quality volume WQv (see RICR 8.9.E-I)?
☒	☐	Is the proposed final impervious cover greater than 20% of the disturbed area (see RICR 8.9.E-I)?
☒	☐	If "Yes," either the Modified Curve Number Method or the Split Pervious/Impervious method in Hydro-CAD was used to calculate WQv; or,
☐	☐	If "Yes," either TR-55 or TR-20 was used to calculate WQv; and,
☐	☐	If "No," the project meets the minimum WQv of 0.2 watershed inches over the entire disturbed area.
☐	☐	Not Applicable
☒	☐	Does this project meet or exceed the ability to treat required water quality flow WQf (see RICR 8.9.I.1-3)?
☒	☐	Does this project propose an increase of impervious cover to a receiving water body with impairments? If "Yes," please indicate below the method that was used to address the water quality requirements of no further degradation to a low-quality water. Fully infiltrating the WQ storm.
☐	☒	RICR 8.36. A Pollutant Loading Analysis is needed and has been completed.
☒	☐	The Water Quality Guidance Document (Water Quality Goals and Pollutant Loading Analysis Guidance for Discharges to Impaired Waters) has been followed as applicable.
☐	☒	BMPs are proposed that are on the approved technology list . If "Yes," please provide all required worksheets from the manufacturer.
☒	☐	Additional pollutant-specific requirements and/or pollutant removal efficiencies are applicable to the site as the result of a TMDL, SAMP, or other watershed-specific requirements. If "Yes," please describe: TMDL for Indian Run Brook. The WQ storm has been fully infiltrated.

TABLE 3-1: Summary of Water Quality (see RICR 8.9)

Design Point and WB ID	Impervious area treated (sq ft)	Total WQ_v Required (cu ft)	LID Stormwater Credits (see RICR 8.18) WQv directed to a QPA (cu ft)	Water Quality Treatment Remaining (cu ft)	Water Quality Provided by BMPs (cu ft)
DP-1:	131	11	0	11	0
DP-2:	24,394	2,033	0	2,033	2,134
TOTALS:	24,524	2,044	0	2,044	2,134

Notes:
1. Only BMPs listed in RICR 8.20 and 8.25 or the Approved Technologies List of BMPs is Acceptable for Water Quality treatment.
2. For each Design Point, the Water Quality Volume Standard must be met for each Waterbody ID.

☒ YES ☐ NO	This project has met the setback requirements for each BMP. If "No," please explain:

☐ Indicate where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.):

Stormwater Report

CONVEYANCE AND NATURAL CHANNEL PROTECTION (RICR 8.10) – MINIMUM STANDARD 4		
YES	**NO**	
☐	☒	Is this standard waived? If "Yes," please indicate one or more of the reasons below:
		☐ The project directs discharge to a large river (i.e., 4th-order stream or larger. See RISDISM Appendix I for State-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters. ☐ The project is a small facility with impervious cover of less than or equal to 1 acre. ☐ The project has a post-development peak discharge rate from the facility that is less than 2 cfs for the 1-year, 24-hour Type III design storm event (prior to any attenuation). (Note: LID design strategies can greatly reduce the peak discharge rate).
☒	☐	Conveyance and natural channel protection for the site have been met. If "No,' explain why:

TABLE 4-1: Summary of Channel Protection Volumes (see RICR 8.10)					
Design Point	**Receiving Water Body Name**	**Coldwater Fishery? (Y/N)**	**Total CPv Required (cu ft)**	**Total CPv Provided (cu ft)**	**Average Release Rate Modeled in the 1-yr storm (cfs)**
DP-1:	Indian Run Brook	N	See below	See below	See below
DP-2:	Indian Run Brook Tributary	N	See below	See below	See below
TOTALS:					
Note: The Channel Protection Volume Standard must be met in each waterbody ID. The 1-year storm is fully infiltrated by Infiltration Pond A. therefore the channel protection requirement has been met					
☐ YES ☒ NO	The CPv is released at roughly a uniform rate over a 24-hour duration (see examples of sizing calculations in Appendix D of the RISDISM).				
☐ YES ☒ NO	Do additional design restrictions apply resulting from any discharge to cold-water fisheries; If "Yes," please indicate restrictions and solutions below.				
☒ Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.). Stormwater Report					

OVERBANK FLOOD PROTECTION (RICR 8.11) AND OTHER POTENTIAL HIGH FLOWS – MINIMUM STANDARD 5			
YES	**NO**		
☐	☒	Is this standard waived? If yes, please indicate one or more of the reasons below:	
		☐	The project directs discharge to a large river (i.e., 4th-order stream or larger. See Appendix I for state-wide list and map of stream orders), bodies of water >50.0 acres in surface area (i.e., lakes, ponds, reservoirs), or tidal waters.
		☐	A Downstream Analysis (see RICR 8.11.D and E) indicates that peak discharge control would not be beneficial or would exacerbate peak flows in a downstream tributary of a particular site (e.g., through coincident peaks).
☐	☒	Does the project flow to an MS4 system or subject to other stormwater requirements? If "Yes," indicate as follows:	
		☐	RIDOT
		☐	Other (specify):
Note: The project could be approved by RIDEM but not meet RIDOT or Town standards. RIDOT's regulations indicate that post-volumes must be **less** than pre-volumes for the 10-yr storm at the design point entering the RIDOT system. If you have not already received approval for the discharge to an MS4, please explain below your strategy to comply with RIDEM and the MS4.			
		Indicate below which model was used for your analysis. ☐ TR-55 ☐ TR-20 ☒ HydroCAD ☐ Bentley/Haestad ☐ Intellisolve ☐ Other (Specify):	
YES	**NO**		
☒	☐	Does the drainage design demonstrate that flows from the 100-year storm event through a BMP will safely manage and convey the 100-year storm? If "No," please explain briefly below and reference where in the application further documentation can be found (i.e., name of report/document, page numbers, appendices, etc.):	
☒	☐	Do off-site areas contribute to the sub-watersheds and design points? If "Yes,"	
☒	☐	Are the areas modeled as "present condition" for both pre- and post-development analysis?	
☒	☐	Are the off-site areas shown on the subwatershed maps?	
☒	☐	Does the drainage design confirm safe passage of the 100-year flow through the site for off-site runoff?	
☐	☒	Is a Downstream Analysis required (see RICR 8.11.E.1)?	
☒	☐	Calculate the following:	
		☐	Area of disturbance within the sub-watershed (areas): 3.248 ac
		☐	Impervious cover (%): 32.6%
☐	☒	Is a dam breach analysis required (earthen embankments over six (6) feet in height, or a capacity of 15 acre-feet or more, and contributes to a significant or high hazard dam)?	
☒	☐	Does this project meet the overbank flood protection standard?	

Table 5-1 Hydraulic Analysis Summary								
Subwatershed (Design Point)	**1.2" Peak Flow** (cfs) **		**1-yr Peak Flow** (cfs)		**10-yr Peak Flow** (cfs)		**100-yr Peak Flow** (cfs)	
	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)	Pre (cfs)	Post (cfs)
DP-1:	0.01	0.02	0.07	0.09	0.23	0.25	0.55	0.54
DP-2:	0.30	0.24	1.67	1.47	6.52	4.88	16.87	16.52
TOTALS:	0.31	0.26	1.74	1.56	6.75	5.13	17.42	17.06

** Utilize modified curve number method or split pervious /impervious method in HydroCAD.

Note: The hydraulic analysis must demonstrate no impact to each individual subwatershed DP unless each DP discharges to the same wetland or water resource.

Indicate as follows where the pertinent calculations and/or information for the items above are provided	**Name of report/document, page numbers, appendices, etc.**
Existing conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, and water surface elevations showing methodologies used and supporting calculations.	Stormwater report
Proposed conditions analysis for each subwatershed, including curve numbers, times of concentration, runoff rates, volumes, water surface elevations, and routing showing the methodologies used and supporting calculations.	Stormwater report
Final sizing calculations for structural stormwater BMPs, including contributing drainage area, storage, and outlet configuration.	Stormwater report
Stage-storage, inflow and outflow hydrographs for storage facilities (e.g., detention, retention, or infiltration facilities).	Stormwater report

Table 5-2 Summary of Best Management Practices											
BMP ID	**DP #**	**BMP Type** (e.g., bioretention, tree filter)	**BMP Functions**					**Bypass Type**	**Horizontal Setback Criteria are met per RICR 8.21.B.10, 8.22.D.11, and 8.35.B.4**		
			Pre-Treatment (Y/N/NA)	Re_v	WQ_v	CP_v (Y/N/NA)	Overbank Flood Reduction (Y/N/NA)	External (E) Internal (I) or NA	Yes/No	Technical Justification (Design Report page number)	Distance Provided
204/206/208	2	Pond Complex A (sediment forebay, WQ Infiltration, Infiltration)	Y	Y	Y	Y	Y	Internal	Yes	See Plans	See Plans
	2	Drywells	NA	Y	Y	NA	NA	NA	Yes	See Plans	See Plans
		TOTALS:									

Table 5.3 Summary of Soils to Evaluate Each BMP									
DP #	**BMP ID**	**BMP Type** (e.g., bioretention, tree filter)	**Soils Analysis for Each BMP**						
			Test Pit ID# and Ground Elevation		SHWT Elevation (ft)	Bottom of Practice Elevation* (ft)	Separation Distance Provided (ft)	Hydrologic Soil Group (A, B, C, D)	Exfiltration Rate Applied (in/hr)
			Primary	Secondary					
2	206	WQ Infiltration	22-8	22-10	92.47	94.50	2.03	C	0.99
2	208	Infiltration	22-8	22-10	92.17	94.50	2.33	C	0.99
		TOTALS:							

* For underground infiltration systems (UICs) bottom equals bottom of stone, for surface infiltration basins bottom equals bottom of basin, for filters bottom equals interface of storage and top of filter layer

LAND USES WITH HIGHER POTENTIAL POLLUTANTS LOADS (LUHPPLs) – MINIMUM STANDARD 8			
YES	**NO**	**N/A**	
☐	☐	☒	Describe any LUHPPLs identified in Part 1, Minimum Standard 8, Section 2. If not applicable, continue to Minimum Standard 9.
☐	☐	☒	Are these activities already covered under an MSGP? If "No," please explain if you have applied for an MSGP or intend to do so?
☐	☐	☒	List the specific BMPs that are proposed for this project that receive stormwater from LUHPPL drainage areas. These BMP types must be listed in RISDISM Table 3-3, "Acceptable BMPs for Use at LUHPPLs." Please list BMPs:
☐	☐	☒	Additional BMPs, or additional pretreatment BMP's if any, that meet RIPDES MSGP requirements; Please list BMPs:
			Indicate below where the pertinent calculations and/or information for the above items are provided (i.e., name of report/document, page numbers, appendices, etc.).

ILLICIT DISCHARGES – MINIMUM STANDARD 9			
Illicit discharges are defined as unpermitted discharges to Waters of the State that do not consist entirely of stormwater or uncontaminated groundwater, except for certain discharges identified in the RIPDES Phase II Stormwater General Permit.			
YES	**NO**	**N/A**	
☐	☒	☐	Have you checked for illicit discharges?
☐	☒	☐	Have any been found and/or corrected? If "Yes," please identify.
☐	☒	☐	Does your report explain preventative measures that keep non-stormwater discharges out of the Waters of the State (during and after construction)?

SOIL EROSION AND SEDIMENT CONTROL (SESC) – MINIMUM STANDARD 10				
YES	**NO**	**N/A**		
☒	☐	☐	Have you included a Soil Erosion and Sediment Control Plan Set and/or Complete Construction Plan Set?	
☒	☐	☐	Have you provided a **separately-bound** document based upon the SESC Template? If yes, proceed to Minimum Standard 11 (the following items can be assumed to be addressed).	
			If "No," include a document with your submittal that addresses the following elements of an SESC Plan:	
			☒	Soil Erosion and Sediment Control Plan Project Narrative, including a description of how the fifteen (15) Performance Criteria have been met:
			☒	Provide Natural Buffers and Maintain Existing Vegetation
			☒	Minimize Area of Disturbance
			☒	Minimize the Disturbance of Steep Slopes
			☒	Preserve Topsoil
			☒	Stabilize Soils
			☒	Protect Storm Drain Inlets
			☒	Protect Storm Drain Outlets
			☒	Establish Temporary Controls for the Protection of Post-Construction Stormwater Control Measures
			☒	Establish Perimeter Controls and Sediment Barriers
			☒	Divert or Manage Run-On from Up-Gradient Areas
			☒	Properly Design Constructed Stormwater Conveyance Channels
			☒	Retain Sediment On-Site
			☒	Control Temporary Increases in Stormwater Velocity, Volume, and Peak Flows
			☒	Apply Construction Activity Pollution Prevention Control Measures
			☒	Install, Inspect, and Maintain Control Measures and Take Corrective Actions
			☒	Qualified SESC Plan Preparer's Information and Certification
			☒	Operator's Information and Certification; if not known at the time of application, the Operator must certify the SESC Plan upon selection and prior to initiating site activities
			☒	Description of Control Measures, such as Temporary Sediment Trapping and Conveyance Practices, including design calculations and supporting documentation, as required

STORMWATER MANAGEMENT SYSTEM OPERATION, MAINTENANCE, AND POLLUTION PREVENTION PLAN – MINIMUM STANDARDS 7 AND 9		
Operation and Maintenance Section		
YES	**NO**	
☒	☐	Have you minimized all sources of pollutant contact with stormwater runoff, to the maximum extent practicable?
☒	☐	Have you provided a **separately-bound** Operation and Maintenance Plan for the site and for all of the BMPs, and does it address each element of RICR 8.17 and RISDISM Appendix C and E?
☒	☐	Lawn, Garden, and Landscape Management meet the requirements of RISDISM Section G.7? If "No," why not?
☒	☐	Is the property owner or homeowner's association responsible for the stormwater maintenance of all BMP's? If "No," you must provide a legally binding and enforceable maintenance agreement (see RISDISM Appendix E, page 26) that identifies the entity that will be responsible for maintenance of the stormwater. Indicate where this agreement can be found in your report (i.e., name of report/document, page numbers, appendices, etc.).
☐	☒	Do you anticipate that you will need legal agreements related to the stormwater structures? (e.g. off-site easements, deed restrictions, covenants, or ELUR per the Remediation Regulations). If "Yes," have you obtained them? Or please explain your plan to obtain them:

☐	☒	Is stormwater being directed from public areas to private property? If "Yes," note the following: Note: This is not allowed unless a funding mechanism is in place to provide the finances for the long-term maintenance of the BMP and drainage, or a funding mechanism is demonstrated that can guarantee the long-term maintenance of a stormwater BMP by an individual homeowner.
Pollution Prevention Section		
☐	☒	Designated snow stockpile locations?
☐	☒	Trash racks to prevent floatables, trash, and debris from discharging to Waters of the State?
☒	☐	Asphalt-only based sealants?
☐	☒	Pet waste stations? (Note: If a receiving water has a bacterial impairment, and the project involves housing units, then this could be an important part of your pollution prevention plan).
☒	☐	Regular sweeping? Please describe:
☒	☐	De-icing specifications, in accordance with RISDISM Appendix G. (NOTE: If the groundwater is GAA, or this area contributes to a drinking water supply, then this could be an important part of your pollution prevention plan).
☒	☐	A prohibition of phosphate-based fertilizers? (Note: If the site discharges to a phosphorus impaired waterbody, then this could be an important part of your pollution prevention plan).

PART 4. SUBWATERSHED MAPPING AND SITE-PLAN DETAILS

Existing and Proposed Subwatershed Mapping (REQUIRED)			
YES	**NO**		
☒	☐		Existing and proposed drainage area delineations
☒	☐		Locations of all streams and drainage swales
☒	☐		Drainage flow paths, mapped according to the DEM *Guidance for Preparation of Drainage Area Maps* (included in RISDISM Appendix K)
☒	☐		Complete drainage area boundaries; include off-site areas in both mapping and analyses, as applicable
☒	☐		Logs of borings and/or test pit investigations along with supporting soils/geotechnical report
☒	☐		Mapped seasonal high-water-table test pit locations
☒	☐		Mapped locations of the site-specific borings and/or test pits and soils information from the test pits at the locations of the BMPs
☒	☐		Mapped locations of the BMPs, with the BMPs consistently identified on the Site Construction Plans
☒	☐		Mapped bedrock outcrops adjacent to any infiltration BMP
☒	☐		Soils were logged by a:
		☒	DEM-licensed Class IV soil evaluator Name: Timothy Twohig
		☐	RI-registered P.E. Name:

Subwatershed and Impervious Area Summary				
Subwatershed (area to each design point)	**First Receiving Water ID or MS4**	**Area Disturbed (units)**	**Existing Impervious (units)**	**Proposed Impervious (units)**
DP-1:	Indian Run Brook	0.049 ac	0.012 ac	0.015 ac
DP-2:	Indian Run Brook Tributary	3.201 ac	0.305 ac	0.740 ac
DP-3:				
DP-4:				
TOTALS:				

Site Construction Plans (Indicate that the following applicable specifications are provided)		
YES	**NO**	
☒	☐	Existing and proposed plans (scale not greater than 1" = 40') with North arrow
☒	☐	Existing and proposed site topography (with 1 or 2-foot contours); 10-foot contours accepted for off-site areas
☒	☐	Boundaries of existing predominant vegetation and proposed limits of clearing
☒	☐	Site Location clarification
☒	☐	Location and field-verified boundaries of resource protection areas such as: ► freshwater and coastal wetlands, including lakes and ponds ► coastal shoreline features Perennial and intermittent streams, in addition to Areas Subject to Storm Flowage (ASSFs)
☒	☐	All required setbacks (e.g., buffers, water-supply wells, septic systems)
☒	☐	Representative cross-section and profile drawings, and notes and details of structural stormwater management practices and conveyances (i.e., storm drains, open channels, swales, etc.), which include: ► Location and size of the stormwater treatment practices (type of practice, depth, area). Stormwater treatment practices (BMPs) must have labels that correspond to RISDISM Table 5-2; ► Design water surface elevations (applicable storms); ► Structural details of outlet structures, embankments, spillways, stilling basins, grade-control structures, conveyance channels, etc.; ► Existing and proposed structural elevations (e.g., inverts of pipes, manholes, etc.); ► Location of floodplain and, if applicable, floodway limits and relationship of site to upstream and downstream properties or drainage that could be affected by work in the floodplain; ► Planting plans for structural stormwater BMPs, including species, size, planting methods, and maintenance requirements of proposed planting
☒	☐	Logs of borings and/or test pit investigations along with supporting soils/geotechnical report and corresponding water tables
☐	☒	Mapping of any OLRSMM-approved remedial actions/systems (including ELURs)
☒	☐	Location of existing and proposed roads, buildings, and other structures including limits of disturbance; ► Existing and proposed utilities (e.g., water, sewer, gas, electric) and easements; ► Location of existing and proposed conveyance systems, such as grass channels, swales, and storm drains, and location(s) of final discharge point(s) (wetland, waterbody, etc.); ► Cross sections of roadways, with edge details such as curbs and sidewalks; ► Location and dimensions of channel modifications, such as bridge or culvert crossings
☐	☒	Locations, cross sections, and profiles of all stream or wetland crossings and their method of stabilization

1.0 Project Description

The purpose of this report is to specify a Stormwater Management System to be implemented at the proposed Saugatucket Acres residential development at 176 Saugatucket Road in South Kingstown. The site is located on Assessors' Plat 42 Lot 9. The site exists today with a single residence and contains wetlands on the southern and eastern side of the property. Indian Run Brook, which is impaired for fecal coliform, copper and zinc, briefly crosses the southeastern property corner. The client proposes to demolish the existing home, barn, and driveway, and divide the site into five single-family lots with a shared driveway. The proposed lots will be serviced by on-site wastewater treatment systems and public water.

The stormwater quality will be improved by utilizing Best Management Practices (BMPs) as established by the RISDISM for the treatment of stormwater runoff from the proposed development. BMPs will consist of drywells, a sediment forebay, and infiltration ponds. The system has been designed to meet the RIDEM Stormwater Design and Installations Standards Manual.

2.0 Site Conditions

2.1 SOILS

There are the following soil types within the analyzed area of the Site as mapped by the NRCS USDA Soil Conservation service:

Soil Symbol	Description	Hydrologic Group
BrA	Broadbrook silt loam, 0 to 3 percent slopes	C
RaB	Rainbow silt loam, 3 to 8 percent slopes	C
Se	Stissing silt loam	D
Sf	Stissing very stony silt loam	D

Site specific soil evaluations can be found in Appendix A2.1.

2.2 EXISTING SITE CONDITIONS

Currently, the northern and western portions of the site have a mixture of grass and brush and contains an existing residence with a barn and driveway with access on Saugatucket Road. The southern and eastern portions of the site are predominantly wooded wetlands. Indian Run Brook, which has impairments for fecal coliform, copper and zinc, briefly crosses the southeastern property corner. The site is surrounded by residences on the north and west sides, and wetlands on the east and south sides.

Stone walls encompass the northern and western of property edges, forming topographic ridges. The site is relatively flat and generally slopes from the northwest to the southeast.

Two design points have been identified on. Design Point-1 is the roadside swale along Saugatucket Road that flows west. Stormwater from this design point continues along Saugatucket Road until it reaches a tributary of Indian Run Brook. Design Point-2 is the A-Series Wetland in the southeaster portion of the

site. Stormwater from this design point continues through the wetland until it reaches Indian Run Brook.

Stormwater onsite is not currently treated before it is discharged to the design points.

2.3 POST SITE CONDITIONS

The proposed drainage analysis uses stormwater management systems to control and treat runoff from the proposed development. The following BMP's are used on site and have been designed to include the following elements:

- Sediment Forebay
    - Pretreatment of driveways
    - 2.0' forebay depth with proposed 2:1 reinforced slopes.
    - Acts as a water quality bypass. The water quality storm is directed to the water quality infiltration basin while other storms are bypassed within sediment forebay to Infiltration Pond A.
        - Equipped with Water quality stormwater event by-pass to the water quality BMP.
        - Equipped with secondary weir for larger stormwater events to detention pond
            - Velocities < 2 ft/sec over weir from Sediment Forebay to the CPv/QP BMP.
- WQ Infiltration Pond
    - Fully infiltrates the water quality stormwater event.
- Open Channels (Swales)
    - Provide conveyance of stormwater.
- Infiltration Pond
    - All stormwater is treated before entering the stormwater basin.
    - Fully infiltrates the Channel Protection Volume (CPv).
    - Provided Overbank Flood Protection (Qp) for the 2-100 year storm events.
- Drywells
    - WQ treatment of roofs
    - Fully infiltrates the water quality storm event.

The above elements will used to meet the design standards of the Rhode Island Stormwater Design and Installation Standard.

The primary goal of increasing water quality treatment is accomplished by providing drywells, a sediment forebay, and a water quality infiltration pond. Stormwater runoff mitigation is provided through the use of the infiltration pond. While this project has not been classified as a redevelopment project, impervious areas exist onsite and currently runoff untreated to a waterbody with a TMDL and an impairment. The proposed design now fully treats all proposed impervious to the impaired waterbody and fully infiltrates the 1-year storm. By reducing post development stormwater flow rate to a level no greater than the pre-development rate, the second goal of the proposed drainage system is achieved. Any potential impacts from the proposed development on the abutting properties, wetlands and Indian Run Brook have been mitigated.

3.0 Minimum Standards

The site has been designed to meet the minimum standards as outlined in the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM). The following sections outline how the site meets and exceeds the minimum required standards.

3.1 Minimum Standard 1: LID Site Planning and Design Strategies

See "Appendix A: Stormwater Management Checklist" from the RISDISM provided at the beginning of this report.

3.2 Minimum Standard 2: Groundwater Recharge

Groundwater is to be recharged per watershed based on impervious area coverage in accordance with section 3.2.2 of the RISDISM.

Groundwater recharge is determined from the following equation:

Re_V=1"*F*I/12

Where:

Re_V=Groundwater Recharge Volume (cf)

F=Recharge Factor based on Hydrologic Soil Groups (HSG) (see table below)

I=Impervious Area (sf)

HSG	Recharge Factor (F)
A	0.60
B	0.35
C	0.25
D	0.10

Recharge volumes are provided through the use of house drywells and WQ Infiltration Pond A. See Table 2-1 of the Appendix A checklist for a summary of recharge values.

The required recharge volume is based on all impervious area, not just areas which are captured in the proposed BMPs.

See Appendix A3.2 for the water quality storm HydroCAD analysis. The water quality storm is calculated in HydroCAD using the 'calculate separate Pervious/Impervious runoff' option.

3.3 Minimum Standard 3: Water Quality

All stormwater is treated through an approved BMP before being discharged. This site has been designed to use drywells and a WQ Infiltration Pond to treat stormwater before being infiltrated within the infiltration basin. See the drywell and infiltration pond design sheets for water quality requirements. Indian Run Brook is the ultimate receiving waterbody for design point 1 and has a TMDL for fecal coliform, copper and zinc.

Drywells

Each roof is directed to a drywell, which fully infiltrates the water quality storm event. Drywells have been designed in HydroCAD and have been assigned an infiltration rate based on infiltration tests that have been conducted onsite. To be conservative, the infiltration rates used in the design are ½ of what was observed in the field. It should be noted that, to be conservative, drywells have not been included in

the HydroCAD model. Roof areas are within the subcatchments that the drywell will overtop in during larger storm events.

Water Quality Infiltration Pond

The infiltration pond has been sized using HydroCAD and an infiltration rate based on a parent material within the footprint of the BMP. The project site largely consists of silty loam and an infiltration rate was measured in the field. To be conservative, the infiltration rate used in the design is ½ of what was observed in the field. See Appendix A3.2 for the HydroCAD analysis for the water quality event. The infiltration pond has been designed to fully infiltrate the water quality event.
Pretreatment for the infiltration pond has been provided through the use of a sediment forebay. The forebay has been sized per section 6.4 of the RISDISM.

Infiltration Pond Parameters:

BMP	Total Watershed Area (acres)	Impervious (acres)	Required Forebay Volume (cf)	Provided Forebay Volume (cf)	Required Surface Area, As (sf)	Provided Surface Area, As (sf)
Pond-A	1.630	0.318	296	399	20	88

3.4 Minimum Standard 4: Conveyance and Natural Channel Protection

3.4.1 Drainage Network Design Parameters:

A. PIPES

- All drainage pipes are HDPE or equivalent unless otherwise noted.
- Manning's coefficient = 0.012 for HDPE Pipe
- Diameters & lengths as specified

B. STRUCTURES

- No structures are proposed

C. OPEN CHANNELS SYSTEMS (SWALES)

- All open channels systems shall be grass channels
- Manning's coefficient =0.030
- Width, depth, slope and side slopes as noted on plans.
- The 100-year design storm is utilized for the open channel design to ensure that the drainage system contains and channels water to the BMP areas as shown on the plans.

3.4.2 Channel Protection Volume:

The site has been designed to fully infiltrate the channel protection volume. The channel protection required has been met.
See table 4-1 of the Appendix A Checklist for a Summary of Channel Protection Volumes. See Appendix A3.5.4.2 for the 1-year storm event HydroCAD analysis.

3.5 Minimum Standard 5: Overbank Flood Protection & Downstream Analysis

3.5.1 Method of Analysis

USDA Soil Conservation Service Method as defined by Technical Release No. 20 (TR-20) determines Stormwater runoff rate and volume. Type III rainfall distribution is utilized. Time of concentration is

determined using Technical Release No 55 (TR-55) methodology, through the computer program *HydroCAD ver. 10.0* by HydroCAD Software Solutions LLC.
Infiltration pond soils has been modeled in HydroCAD with a 0.99 inches/hr infiltration rate, which is ½ the rate that was observed in the field. Soil evaluations and infiltration tests have been performed by DiPrete Engineering. The existing soil has a texture of predominantly silty loam.
The drainage system has been designed to mitigate all stormwater flows for the 10- and 100-year storm events. The emergency outlets have been sized to handle the 100-year storm event.

3.5.2 Design Storm
Analysis of 1-year, 10-year, 25-year, and 100-year frequency storms are included. The following 24-hour rainfall intensities are obtained from the Rhode Island Stormwater Design and Installation Standards Manual, Table 3-1 for Washington County.

1 year =	2.8 inches
10 year =	4.9 inches
25 year =	6.1 inches
100 year=	8.5 inches

3.5.3 Design Point Breakdown
The site is analyzed as two watershed areas. In the pre-development stage, there are five subcatchments. In the post development stage, there are six subcatchments. Each watershed will demonstrate zero increase of runoff due to the proposed development. A description of each watershed and associated subcatchments are summarized as follows, for cover types see color watershed maps located in back of this report. Numbers in parentheses ( ) indicate the HydroCAD Node Number.

Design Point 1:
Watershed one flows to Design Point- 1 (DP-1). The design point is a swale along Saugatucket Road that flows west.

In pre-development conditions there is only one watershed to Design Point-1 (12).

Pre-01 (11) contains the northwest corner of the property and Saugatucket Road. Stormwater reaches DP-1 (12) via overland flow.

In post development conditions there is one subwatershed:

Post-1 (101) collects runoff from the northwestern corner of the property and Saugatucket Road.

Below is a summary of the hydrologic parameters for the pre and post development sub-areas in Design Point-1.

	Area (acres)	CN	Tc (min)
Pre-01	0.087	75	6.0
Post-01	0.078	79	6.0

Design Point 2:

Watershed two flows to Design Point- 2 (DP-2). The design point is the A-Series Wetland to the south and east.

In pre-development conditions there are four watersheds to Design Point-2.

Pre-02 (21) contains the western section of the site. Stormwater reaches DP-2 (25) via overland flow.

Pre-03 (22) contains the centermost section of the site. Stormwater reaches DP-2 (25) via overland flow.

Pre-04 (23) contains the northeastern portion of the site. Stormwater reaches DP-2 (25) via overland flow through the B-Series Wetland.

Pre-05 (24) contains a small section of the site along Saugatucket and predominantly contains offsite area. Stormwater reaches DP-2 via overland flow via a swale along Saugatucket Road.

In post development conditions there are five sub watersheds:

Post-2 (201) collects runoff from the western side of the site. Stormwater reaches DP-2 via overland flow.

Post-3 (202) contains a small section of the site along Saugatucket and predominantly contains offsite area. Stormwater reaches DP-2 via overland flow via a swale along Saugatucket Road.

Post-4 (203) is the center of the site and includes the proposed driveways and most of the drywells. Stormwater reaches DP-2 via Pond Complex A (204, 206, 208). Drywells within this subcatchment fully infiltrate the water quality storm. During larger storm events, runoff from the roof areas flow overland to Pond Complex A (204, 206, 208)

Post-4 (205) is the WQ Infiltration Pond A area.

Post-5 (207) is the Infiltration Pond A area.

3.5.4 Q_p BMP Calculations

The section includes calculations for each Qp BMP for the site. Calculations are for Emergency Outlet Calculations.

The emergency outlet has been sized to safely pass the 100-year storm and beyond without erosion or overtopping the embankment. For this analysis, the infiltration pond was assumed to have no proposed infiltration and only the weir functioning. Under normal conditions, the basin will have a minimum of one foot of freeboard.

Basin	Q(cfs)	V (ft/s)	Top of Basin	Flood Elevation
Pond A	9.01	2.63	97.00	96.44

The velocity over the spillway is less than 3 ft/s thus no erosion will take place on the embankment or downstream. The basin maintains freeboard even with no infiltration and the 100-year storm flowing over the embankment. See attached HydroCAD.

3.5.5 Downstream Analysis

A downstream analysis is required under the following conditions:

Area of Disturbance (Acres)	Impervious Cover (%)
>5 to 10	>75
>10 to 25	>50
>25 to 50	>25
>50	All Projects

The proposed project disturbs 3.3 acres and is 0.799 acres of impervious. This is approximately 24% impervious cover. A downstream analysis is not required.

3.5.6 Overbank Flood Protection Conclusion

The tables below presents a summary of the pre development flows vs. the mitigated post development flows. The table shows a decrease in the rate of runoff for all storms included in the analysis.

Pre Development Flows vs. Post Development Flows Mitigated

Pre-development Conditions versus Post Development Conditions Flow Rates for each watershed are summarized below:

Subwatershed (design point)	**1-yr Peak Flow**		**2-yr Peak Flow**		**10-yr Peak Flow**		**25-yr Peak Flow**		**100-yr Peak Flow**	
	Pre	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
DP-1: Saugatucket Road	0.07	0.09	0.11	0.13	0.23	0.25	0.34	0.35	0.55	0.54
DP-2: Wetland A	1.67	1.47	2.67	2.10	6.52	4.88	9.80	8.90	16.87	16.52
Totals:	1.74	1.56	2.78	2.23	6.75	5.13	10.14	9.25	17.42	17.06

All flows in cubic feet per second (cfs)

As shown in the tables above, minimal to no increase in stormwater runoff flow will occur following the proposed construction during the 1 through 100-year storm events.

3.6 Minimum Standard 6: Redevelopment and Infill Projects.

The site is not classified as a redevelopment or infill project.

3.7 Minimum Standard 7: Pollution Prevention

A Soil Erosion and Sediment Control Plan (SESC) for this development can be found under a separate document. See the Soil Erosion and Sediment Control Plan for the development prepared by DiPrete Engineering. The SESC contains information for construction pollution prevention. For post construction pollution prevention see the Operations and Maintenance (O&M) document prepared for this development by DiPrete Engineering.

3.8 Minimum Standard 8: Land Uses with High Potential Pollutant Loads (LUHPPLs)

The site is not considered LUHPPL.

3.9 Minimum Standard 9: Illicit Discharges

There are no proposed Illicit Discharges on site. The site will be serviced by public water and private OWTS.

3.10 Minimum Standard 10: Construction Activity Soil Erosion, Runoff and Sedimentation and Pollution Prevention Control Measure Requirements

See the SESC for this development prepared by DiPrete Engineering.

3.11 Minimum Standard 11: Stormwater Management System Operation and Maintenance

See the O&M for this development prepared by DiPrete Engineering.

Appendix A

A2.1 Soil Evaluations

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/15/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Overcast, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH D3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	10-43	C	S	2.5Y 4/4	10YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	43-53	C	S	5Y 5/2	7.5YR 5/6	M C P	sil	0 M	Fr	5
2Cd	53-96			5Y 3/1			Gr fsl	0 M	Fr	8m

TH____ Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				

TH D3 Soil Class Loess/dense Total Depth 96" Impervious/Limiting Layer Depth -(og) GW Seepage Depth 96" SHWT 24"(og)

TH _____ Soil Class _____ Total Depth _____ Impervious/Limiting Layer Depth _____(og) GW Seepage Depth _____ SHWT _____(og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/15/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Sunny, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH 22-A1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-7	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw1	7-28	C	W	2.5Y 5/4	5Y 6/2	C F D	sil	1 SBK	Fr	5
Bw2	28-48	C	S	2.5Y 5/3	7.5YR 5/8	C C P	sil	1 SBK	Fr	5
2Cd	48-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH 22A2 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-12	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	12-25	C	S	10YR 4/4			sil	1 SBK	Fr	5
BC	25-39	C	S	2.5Y 5/2	7.5YR 5/8	M C P	sil	1 SBK	Fr	5
2Cd	39-102			5Y 3/1	7.5YR 5/6	C M P	fsl	0 M	Fr	8

TH 22-A1 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 100" SHWT 21" (og)
TH 22-A2 Soil Class Loess/dense Total Depth 102" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 18" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/15/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Sunny, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH 22-A3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	10-42	C	W	2.5Y 5/4	7.5YR 5/6	C M P	sil	1 SBK	Fr	5
2Cd	42-105			5Y 3/1			Gr fsl	0 M	Fr	8m

TH 22A4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw1	10-20	C	S	10YR 4/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
Bw2	20-31	C	S	2.5Y 5/4	7.5YR 5/8	M C P	sil	1 SBK	Fr	5
Cg	31-47	C	S	2.5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2Cd	47-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH 22-A3 Soil Class Loess/dense Total Depth 105" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 19" (og)
TH 22-A4 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 18" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/15/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Overcast, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH 22-A5 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
HTM	6-0	A	S	10YR 3/3			sil	1 SBK	Fr	Fill
Ap	0-4	C	S	2.5Y 5/4	2.5Y 5/2	F F D	sil	1 SBK	Fr	5
Bw	4-32	C	S	5Y 5/2	7.5YR 5/6	M C P	sil	1 SBK	Fr	5
Cg	32-47	C	S	2.5Y 4/3			sil	0 M	Fr	5
2C	47-61	C	S	5Y 3/1			lfs	0 M	Fr	6
2Cd	61-108						Gr fsl	0 M	Fr	8m
TH 22A6 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	10-20	C	S	2.5Y 5/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	20-31	C	S	5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2Cd	31-47			5Y 3/1			Cb Gr fsl	0 M	Fr	8m

TH 22-A5 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 18" (og)
TH 22-A6 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 21" (og)

Comments: 22-A5 - Ap contains shells, plastic, and wire artifacts.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/15/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Overcast, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH 22-A7 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-13	A	S	10YR 3/3			sil	1 SBK	Fr	
Bw	13-30	C	S	2.5Y 5/4	10YR 5/6	C M D	sil	1 SBK	Fr	
Cg	30-51	C	S	5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	
2C	51-64	C	S	2.5Y 4/3			lfs	0 M	VFr	
2Cd	64-108"			5Y 3/1			Gr fsl	0 M	Fr	

TH 22A8 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-15	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	15-25	C	S	10YR 4/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	25-42	C	S	2.5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2Cd	42-108			5Y 3/1			fsl	0 M	Fr	8

TH 22-A7 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 18" (og)
TH 22-A8 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 18" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Rain, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH 22-A9 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-16	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	16-22	C	S	2.5Y 5/4	10YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	22-39	C	S	5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2Cd	39-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH A10 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-12	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	12-36	C	S	10YR 4/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	36-60	C	S	2.5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2Cd	60-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH 22-A9 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 60" SHWT 18" (og)
TH 22A10 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 60" SHWT 23" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Rain, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH A11 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-9	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	9-38	C	S	2.5Y 5/4	10YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	38-47	C	S	5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2C	47-61	C	S	2.5Y 4/3			lfs	0 M	VFr	8
2Cd	61-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH A12 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-7	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	7-21	C	S	2.5Y 4/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	21-50	C	S	2.5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2C	50-63	C	S	2.5Y 4/3			lfs	0 M	VFr	8
2Cd	63-120			5Y 3/1			Gr fsl	0 M	Fr	8m

TH 22A11 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 61" SHWT 19" (og)
TH 22A12 Soil Class Loess/dense Total Depth 120" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 60" SHWT 16" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Rain, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH A13 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	10-34	C	S	2.5Y 5/4	10YR 5/6	C M D	sil	1 SBK	Fr	5
Cg	34-44	C	S	5Y 5/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
2C	44-66	C	S	2.5Y 4/3			lfs	0 M	VFr	8
2Cd	66-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH A14 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-11	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	11-29	C	S	10YR 4/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
BC	29-33	C	S	2.5Y 4/4	2.5Y 5/1	C M D	sil	1 SBK	Fr	5
2C	33-57	C	S	2.5Y 4/3			lfs	0 M	VFr	8
2Cd	57-108			5Y 3/1			Gr fsl	0 M	Fr	8m

TH 22A13 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 96" SHWT 27" (og)
TH 22A14 Soil Class Loess/dense Total Depth 108" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 108" SHWT 21" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: Joseph and Donna Randle
Property Location: 176 Saugatucket Road South Kingstown
Date of Test Hole: 12/15/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: Overcast, 40 Shaded: Yes ☑ No ☐ Time: 8:00

TH D1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-11	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	11-36	C	S	2.5Y 5/4	10YR 5/6	C M D	sil	1 SBK	Fr	5
2Cd	36-96			5Y 5/2			Gr fsl	0 M	Fr	8m

TH D2 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	10-32	C	S	10YR 4/4	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
2Cd	32-96			5Y 3/1			Gr fsl	0 M	Fr	8

TH D1 Soil Class Loess/dense Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 36" SHWT 24" (og)
TH D2 Soil Class Loess/dense Total Depth 96" Impervious/Limiting Layer Depth - (og) GW Seepage Depth 80" SHWT 20" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: JAE Mills LLC
Property Location: 176 Saugatucket Road (AP 42, Lot 9), South Kingstown
Date of Test Hole: September 5, 2024
Soil Evaluator: Allison Drake License Number: D-4105
Weather: Clear, 70's Shaded: Yes ☐ No ☑ Time: 10:00AM

TH STH 24-1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-9"	C	S	10YR 3/3	-		-		fsl	1-sbk	fri	4
Bw	9-25"	C	S	10YR 4/4	2.5Y 5/2	C	M	P	fsl	1-sbk	fri	4
C1	25-53"	C	S	2.5Y 5/2	7.5YR 5/6	C	M	P	fsl	0m	fri	7
Cd2	53-96"	-	-	5Y 4/3	-		-		sl	0m	fri	8

TH STH 24-2 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-9"	C	S	10YR 3/3	-		-		fsl	1-sbk	fri	4
Bw	9-24"	C	S	10YR 4/4	2.5Y 5/2	C	M	P	fsl	1-sbk	fri	4
C1	24-48"	C	S	2.5Y 5/3	7.5YR 5/6	C	M	P	fsl	0m	fri	7
Cd2	48-96"	-	-	5Y 4/3	-		-		sl	0m	fri	8

TH STH 24-1 Soil Class Dense Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 18" (og)
TH STH 24-2 Soil Class Dense Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 18" (og)

Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** 2232-1533

Property Owner: JAE Mills LLC
Property Location: 176 Saugatucket Road (AP 42, Lot 9), South Kingstown
Date of Test Hole: September 5, 2024
Soil Evaluator: Allison Drake License Number: D-4105
Weather: Clear, 70's Shaded: Yes ☐ No ☑ Time: 10:00AM

TH STH 24-3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
Ap	0-1"	C	S	10YR 3/3	-		-		fsl	1-sbk	fri	4
Bw	11-31"	C	S	10YR 4/4	2.5Y 5/2	C	M	P	fsl	1-sbk	fri	4
C1	31-60"	C	S	2.5Y 5/3	7.5YR 5/6	C	M	P	fsl	0m	fri	7
Cd2	60-96"	-	-	5Y 4/3	-		-		sl	0m	fri	8

TH STH 24-4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox			Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab.	S.	Contr.				
HTM	6-0"											Fill/Loam
Ap	0-9"	C	S	10YR 3/3	-		-		fsl	1-sbk	fri	4
Bw	9-22"	C	S	10YR 4/4	2.5Y 5/2	C	M	P	fsl	1-sbk	fri	4
C1	22-54"	C	S	2.5Y 5/3	7.5YR 5/6	C	M	P	fsl	0m	fri	7
Cd2	54-96"	-	-	5Y 4/3	-		-		sl	0m	fri	8

TH STH 24-3 Soil Class Dense Till Total Depth 96" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth N/A SHWT 18" (og)
TH STH 24-4 Soil Class Dense Till Total Depth 102" Impervious/Limiting Layer Depth N/A (og) GW Seepage Depth 66" SHWT 12" (og)

Comments:

Revised 11/25/18

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: _____
Property Location: 176 Saugatucket Road, Wakefield
Date of Test Hole: 11/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: 50s, rain Shaded: Yes ☑ No ☐ Time: 8:00 - 4:00

TH 1 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-15	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	15-33	C	S	2.5Y 5/4	10YR 4/6	C M D	sil	1 SBK	Fr	5
BC	33-42	C	S	2.5Y 5/3	5YR 4/6	M C P	sil	1 SBK	Fr	5
Cg	42-51	A	S	5Y 5/1	10YR 5/4	C F D	sil	0 M	Fr	5
2C	51-66	C	S	2.5Y 5/3			Cb lfs	0 M	VFr	6m
3Cd	66-120			5Y 3/1			Gr fsl	0 M	Fr	8
TH 2 Horizon	**Depth**	**Horizon Boundaries**		**Soil Colors**		**Re-Dox**	**Texture**	**Structure**	**Consistence**	**Soil Category**
		Dist	**Topo**	**Matrix**	**Re-Dox Features**	**Ab. S. Contr.**				
Ap	0-7	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	7-38	C	S	2.5Y 5/4	2.5Y 5/2	C M D	sil	1 SBK	Fr	5
C	38-55	A	S	2.5Y 5/3	7.5YR 4/6	M C P	sil	0 M	Fr	7
2Cd	55-120			5Y 3/1			fsl	0 M	Fr	8

TH 1 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 21" (og)
TH 2 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth - (og) GW Seepage Depth - SHWT 22" (og)

Comments: _____

Revised 11/25/18

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: _____
Property Location: 176 Saugatucket Road, Wakefield
Date of Test Hole: 11/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: 50s, rain Shaded: Yes ☑ No ☐ Time: 8:00 - 4:00

TH 3 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-11	A	S	10YR 3/3			sil	1 SBK	Fr	5
Bw	11-31	C	S	2.5Y 5/4	7.5YR 5/6	C M P	sil	1 SBK	Fr	5
BC	31-46	A	S	2.5Y 5/3	5YR 4/6	C M P	sil	0 M	Fr	5
2Cd1	46-80	C	S	5Y 3/1			Cb Gr fsl	0 M	Fr	8
2Cd2	80-94	C	W	2.5Y 4/2			Gr ls	0 SGR	Lo	8
R	94									

TH 4 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	C	S	10YR 3/2			sil	1 SBK	Fr	5
Bw	10-29	C	S	2.5Y 5/4	10YR 4/6	C M P	sil	1 SBK	Fr	5
BC	29-35	C	W	2.5Y 5/3	5YR 5/6	M C P	sil	0 M	Fr	5
2C	35-61	C	S	2.5Y 4/3			lfs	0 M	VFr	6
3Cd	61-120			5Y 3/1			Cb fsl	0 M	Fr	8

TH 3 Soil Class Loess/Dense Total Depth 94" Impervious/Limiting Layer Depth 46"(og) GW Seepage Depth - SHWT 21"(og)
TH 4 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 61"(og) GW Seepage Depth - SHWT 17"(og)

Comments: _____

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: _____
Property Location: 176 Saugatucket Road, Wakefield
Date of Test Hole: 11/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: 50s, rain Shaded: Yes ☑ No ☐ Time: 8:00 - 4:00

TH 5 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A	0-11	C	S	10YR 2/2			sil	1 SBK	Fr	5
Bw	11-34	C	S	2.5Y 5/4	7.5YR 4/6	M M P	sil	1 SBK	Fr	5
C	34-65	C	S	5Y 3/1	10YR 5/4	C F D	fsl	0 M	Fr	5
2Cd	65-120			5Y 3/1			Cb fsl	1 Pl	Fr	8

TH 6 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-10	A	S	10YR 2/2			sil	1 SBK	Fr	5
Bw	10-24	C	S	2.5Y 4/3	7.5YR 4/6	C M D	sil	1 SBK	Fr	5
2C	24-45	C	S	5Y 4/2	7.5YR 4/6	C M P	Gr fsl	0 M	Fr	7m
3Cd	45-72	C	S	5Y 3/2	7.5YR 4/6	C M P	Gr fsl	0 M	Fr	6
R	72									

TH 5 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 65" (og) GW Seepage Depth - SHWT 13" (og)
TH 6 Soil Class Loess/Dense Total Depth 72" Impervious/Limiting Layer Depth 45" (og) GW Seepage Depth - SHWT 15" (og)

Comments: _____

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: _____
Property Location: 176 Saugatucket Road, Wakefield
Date of Test Hole: 11/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: 50s, rain Shaded: Yes ☑ No ☐ Time: 8:00 - 4:00

TH 7 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A	0-11	C	S	10YR 2/2	10YR 5/6	C F P	sil	1 SBK	Fr	5
Bw	11-29	C	S	2.5Y 4/3	10YR 5/6	C M D	sil	1 SBK	Fr	5
BC	29-35	C	S	2.5Y 4/2	5YR 4/6	C C D	sil	0 M	Fr	5
2Cd	35-120			2.5Y 4/1	5YR 4/6	C M D	lfs	0 M	Fr	8

TH 8 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-13	A	S	10YR 3/2			sil	1 Gr	Fr	5
Bw	13-30	C	S	10YR 5/6	10YR 5/6	C M D	sil	1 SBK	Fr	5
BC	30-38	C	S	2.5Y 4/2	10YR 5/8	M C P	sil	1 SBK	Fr	5
2Cd1	38-96	C	S	2.5Y 3/1			Cb fsl	0 M	Fr	8
2Cd2	96-120			7.5YR 5/8			Cb Gr cos	0 SGR	Lo	8

TH 7 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 35" (og) GW Seepage Depth 29" SHWT 9" (og)
TH 8 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 38" (og) GW Seepage Depth 72" SHWT 16" (og)

Comments: _____

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: _____
Property Location: 176 Saugatucket Road, Wakefield
Date of Test Hole: 11/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: 50s, rain Shaded: Yes ☑ No ☐ Time: 8:00 - 4:00

TH 9 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A	0-12	C	S	10YR 3/2			sil	1 SBK	Fr	5
Bw	12-33	C	S	10YR 3/6	7.5YR 7/8	C M D	sil	1 SBK	Fr	5
BC	33-44	C	S	2.5Y 4/2	7.5YR 5/6	C M D	sil	0 M	Fr	5
2C	44-60	C	S	10YR 3/3			lfs	0 M	Fr	7
3Cd	60-120			2.5Y 3/2			lfs	0 M	Fr	8

TH 10 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-5	A	S	10YR 3/2			sil	1 SBK	Fr	5
Bw	5-25	C	S	10YR 5/6	7.5YR 3/6	C M D	sil	1 SBK	Fr	5
BC	25-41	C	S	2.5Y 4/2	7.5YR 5/8	M C P	sil	1 SBK	Fr	5
2Cd	41-120			2.5Y 3/2			lfs	0 M	Fr	8

TH 9 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 60" (og) GW Seepage Depth - SHWT 11" (og)
TH 10 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 41" (og) GW Seepage Depth 45" SHWT 9" (og)

Comments: _____

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources
Onsite Wastewater Treatment Systems Program

Site Evaluation Form
Part A – Soil Profile Description **Application Number** _____

Property Owner: _____
Property Location: 176 Saugatucket Road, Wakefield
Date of Test Hole: 11/16/2022
Soil Evaluator: Tim Twohig License Number: D-4073
Weather: 50s, rain Shaded: Yes ☑ No ☐ Time: 8:00 - 4:00

TH 11 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-12	A	S	10YR 2/2			sil	1 SBK	Fr	5
Bw	12-27	C	S	10YR 5/6	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
BC	27-50	C	S	2.5Y 4/2			sil	0 M	Fr	5
2C	50-60	C	S	10YR 3/3			lfs	0 M	Fr	7
3Cd	60-120			5Y 3/1			Cb Gr fsl	0 M	Fr	8

TH 12 Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0-11	A	S	10YR 2/2			sil	1 SBK	Fr	5
Bw	11-23	C	S	10YR 5/6	7.5YR 5/6	C M D	sil	1 SBK	Fr	5
BC	23-43	C	S	2.5Y 4/2	7.5YR 5/8	M C P	sil	0 M	Fr	5
C	43-70	C	S	2.5Y 3/2			fsl	0 M	Fr	5
2Cd	70-120			5Y 3/1			fsl	0 M	Fr	8

TH 11 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 60" (og) GW Seepage Depth - SHWT 18" (og)
TH 12 Soil Class Loess/Dense Total Depth 120" Impervious/Limiting Layer Depth 70" (og) GW Seepage Depth 60" SHWT 16" (og)

Comments: _____

Date	Site	soil type	horizon	depth to hole bottom*	# chambers	area chambers (cm2)	depth water in hole (cm)	drop (cm)	drop (in)	minutes	hour	coeff A	cm3/hour Q	Ksat (cm/hr)	Ksat (in/hr)	Ksat (µm/s)
20240923	AMT 24-1	FSL/Dense Till	Bw (FSL)	24"	2	105	14	0.38	0.15	0.5	0.008333	0.001288	4788	6.166944	2.42793202	17.1304137
20240923	AMT 24-2	FSL/Dense Till	Bw (FSL)	21"	2	105	14	0.31	0.12	0.5	0.008333	0.001288	3906	5.030928	1.98068138	13.9748112
20240923	AMT 24-3	FSL/Dense Till	Bw (FSL)	21"	2	105	14	0.33	0.13	0.5	0.008333	0.001288	4158	5.355504	2.10846728	14.8764119
20240923	AMT 24-4	FSL/Dense Till	Bw (FSL)	20"	2	105	14	0.4	0.16	0.5	0.008333	0.001288	5040	6.49152	2.55571792	18.0320144
20240923	AMT 24-5	FSL/Dense Till	Bw (FSL)	20"	2	105	14	0.31	0.12	0.5	0.008333	0.001288	3906	5.030928	1.98068138	13.9748112

A3.2 Water Quality HydroCAD Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 11: WPre-01 Runoff Area=0.088 ac 13.69% Impervious Runoff Depth=0.16"
Tc=6.0 min CN=71/98 Runoff=0.01 cfs 0.001 af

Link 12: DP-1: Saugatcket Road - West Inflow=0.01 cfs 0.001 af
Primary=0.01 cfs 0.001 af

Subcatchment 21: WPre-02 Runoff Area=1.378 ac 3.47% Impervious Runoff Depth=0.05"
Flow Length=437' Tc=16.3 min CN=69/98 Runoff=0.04 cfs 0.006 af

Subcatchment 22: WPre-03 Runoff Area=1.815 ac 4.37% Impervious Runoff Depth=0.05"
Flow Length=454' Tc=8.8 min CN=66/98 Runoff=0.08 cfs 0.007 af

Subcatchment 23: WPre-04 Runoff Area=0.344 ac 0.00% Impervious Runoff Depth=0.00"
Flow Length=245' Tc=13.2 min CN=65/0 Runoff=0.00 cfs 0.000 af

Subcatchment 24: WPre-05 Runoff Area=0.318 ac 55.92% Impervious Runoff Depth=0.58"
Tc=6.0 min CN=74/98 Runoff=0.19 cfs 0.015 af

Link 25: DP-2: Wetland A Inflow=0.30 cfs 0.029 af
Primary=0.30 cfs 0.029 af

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 1P: Lot 1 WQ Drywell Peak Elev=101.96' Storage=0.001 af Inflow=0.05 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Pond 2P: Lot 2 WQ Drywell Peak Elev=94.96' Storage=0.001 af Inflow=0.05 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Pond 3P: Lot 3 WQ Drywell Peak Elev=94.71' Storage=0.001 af Inflow=0.05 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Pond 4P: Lot 4 WQ Drywell Peak Elev=96.66' Storage=0.001 af Inflow=0.05 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Pond 5P: Lot 5 WQ Drywell Peak Elev=98.42' Storage=0.001 af Inflow=0.05 cfs 0.004 af
Discarded=0.01 cfs 0.004 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.004 af

Subcatchment 101: WPost-01 Runoff Area=0.079 ac 19.72% Impervious Runoff Depth=0.24"
Tc=6.0 min CN=74/98 Runoff=0.02 cfs 0.002 af

Link 102: DP-1: Saugatucket Road - West Inflow=0.02 cfs 0.002 af
Primary=0.02 cfs 0.002 af

Subcatchment 201: WPost-02 Runoff Area=1.479 ac 3.22% Impervious Runoff Depth=0.07"
Flow Length=239' Tc=10.9 min CN=72/98 Runoff=0.04 cfs 0.009 af

Subcatchment 202: WPost-03 Runoff Area=0.361 ac 50.91% Impervious Runoff Depth=0.53"
Tc=6.0 min CN=73/98 Runoff=0.20 cfs 0.016 af

Subcatchment 203: WPost-04 Runoff Area=1.821 ac 27.95% Impervious Runoff Depth=0.32"
Flow Length=165' Tc=15.8 min CN=74/98 Runoff=0.42 cfs 0.049 af

Pond 204: Forebay A Peak Elev=95.58' Storage=667 cf Inflow=0.42 cfs 0.049 af
Primary=0.38 cfs 0.049 af Secondary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.049 af

Subcatchment 205: WPost-05 Runoff Area=0.059 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74/0 Runoff=0.00 cfs 0.000 af

Pond 206: WQ Infiltration Pond A Peak Elev=95.58' Storage=884 cf Inflow=0.39 cfs 0.049 af
Discarded=0.02 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.049 af

Subcatchment 207: WPost-06 Runoff Area=0.154 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74/0 Runoff=0.00 cfs 0.001 af

Pond 208: Infiltration Pond A Peak Elev=94.50' Storage=1 cf Inflow=0.00 cfs 0.001 af
Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Link 209: DP-2: Wetland A Inflow=0.24 cfs 0.025 af
Primary=0.24 cfs 0.025 af

Subcatchment L1: Lot 1 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.05 cfs 0.004 af

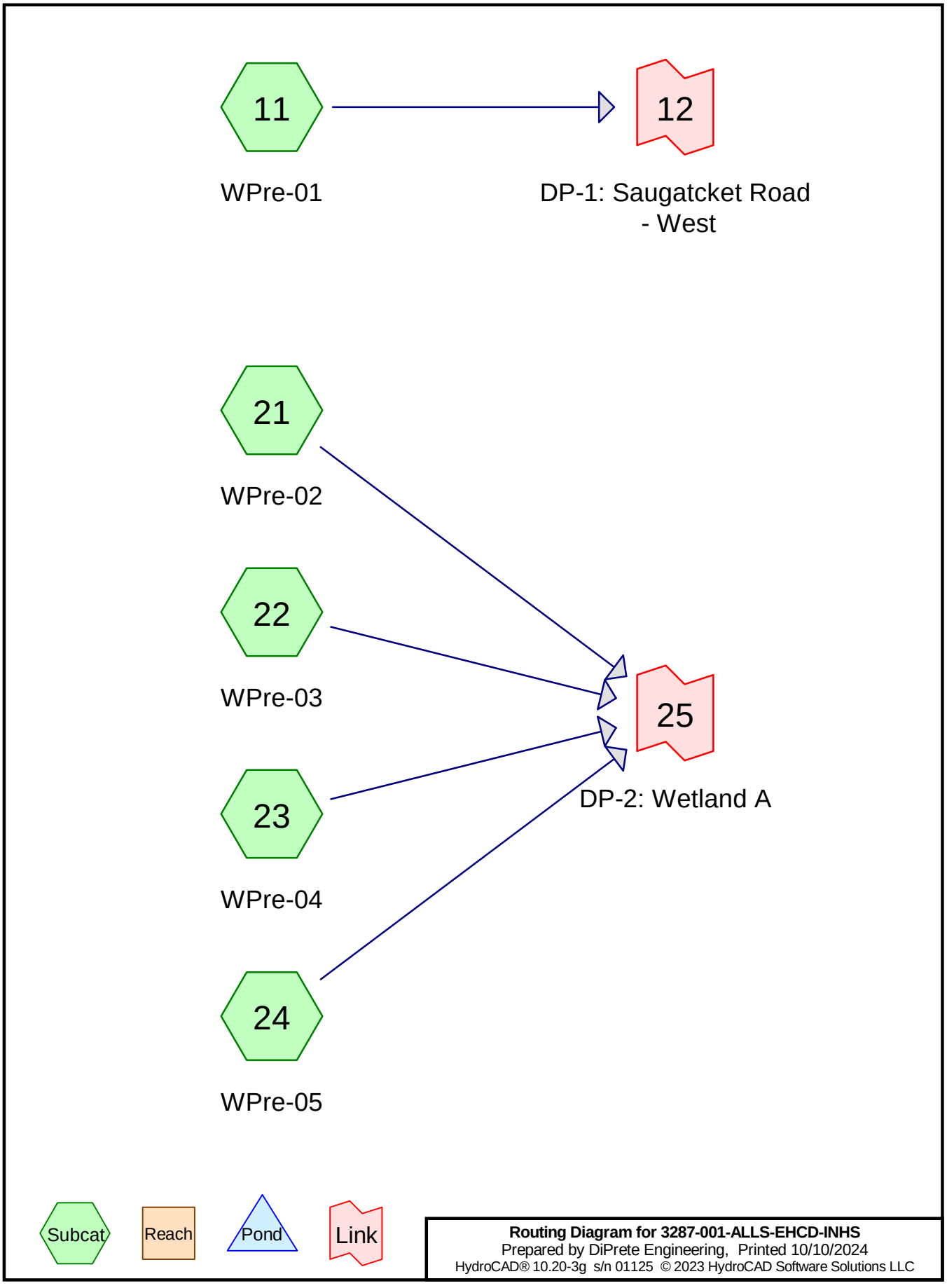
Subcatchment L2: Lot 2 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.05 cfs 0.004 af

Subcatchment L3: Lot 3 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.05 cfs 0.004 af

Subcatchment L4: Lot 4 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.05 cfs 0.004 af

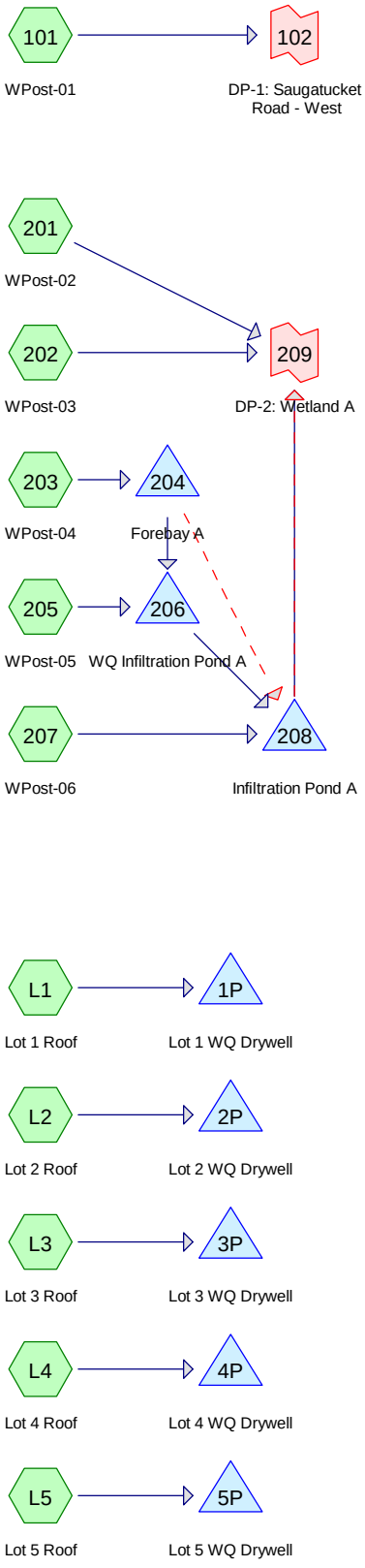
Subcatchment L5: Lot 5 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=0.99"
Tc=6.0 min CN=0/98 Runoff=0.05 cfs 0.004 af

A3.4.2 HydroCAD Node Diagram


11
WPre-01
12
DP-1: Saugatcket Road - West
21
WPre-02
22
WPre-03
23
WPre-04
24
WPre-05
25
DP-2: Wetland A
Subcat
Reach
Pond
Link
Routing Diagram for 3287-001-ALLS-EHCD-INHS
Prepared by DiPrete Engineering, Printed 10/10/2024
HydroCAD® 10.20-3g s/n 01125 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.840	74	>75% Grass cover, Good, HSG C (11, 21, 22, 23, 24)
2.560	65	Brush, Good, HSG C (11, 21, 22, 23, 24)
0.074	98	Impervious, HSG C (21, 22, 24)
0.189	98	Offsite Impervious, HSG C (11, 24)
0.054	98	Roofs, HSG C (21, 22)
0.226	70	Woods, Good, HSG C (11, 21, 22, 24)
3.943	**70**	**TOTAL AREA**



Routing Diagram for 3287-001-ALLS-PHCD-INHS
Prepared by DiPrete Engineering, Printed 1/17/2025
HydroCAD® 10.20-5c s/n 01125 © 2023 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.819	74	>75% Grass cover, Good, HSG C (101, 201, 202, 203, 205, 207)
0.307	65	Brush, Good, HSG C (201, 202)
0.322	98	Impervious, HSG C (101, 202, 203)
0.196	98	Offsite Impervious, HSG C (101, 202)
0.477	98	Roofs, HSG C (201, 203, L1, L2, L3, L4, L5)
0.070	70	Woods, Good, HSG C (201)
4.190	**79**	**TOTAL AREA**

A3.5.4.1 HydroCAD 1-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Subcatchment 11: WPre-01 Runoff Area=0.088 ac 13.69% Impervious Runoff Depth=0.78"
Tc=6.0 min CN=74 Runoff=0.07 cfs 0.006 af

Link 12: DP-1: Saugatcket Road - West Inflow=0.07 cfs 0.006 af
Primary=0.07 cfs 0.006 af

Subcatchment 21: WPre-02 Runoff Area=1.378 ac 3.47% Impervious Runoff Depth=0.61"
Flow Length=437' Tc=16.3 min CN=70 Runoff=0.59 cfs 0.070 af

Subcatchment 22: WPre-03 Runoff Area=1.815 ac 4.37% Impervious Runoff Depth=0.49"
Flow Length=454' Tc=8.8 min CN=67 Runoff=0.70 cfs 0.074 af

Subcatchment 23: WPre-04 Runoff Area=0.344 ac 0.00% Impervious Runoff Depth=0.42"
Flow Length=245' Tc=13.2 min CN=65 Runoff=0.09 cfs 0.012 af

Subcatchment 24: WPre-05 Runoff Area=0.318 ac 55.92% Impervious Runoff Depth=1.57"
Tc=6.0 min CN=87 Runoff=0.58 cfs 0.041 af

Link 25: DP-2: Wetland A Inflow=1.67 cfs 0.197 af
Primary=1.67 cfs 0.197 af

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Pond 1P: Lot 1 WQ Drywell Peak Elev=103.11' Storage=0.001 af Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.007 af Primary=0.12 cfs 0.003 af Outflow=0.13 cfs 0.010 af

Pond 2P: Lot 2 WQ Drywell Peak Elev=96.06' Storage=0.003 af Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.007 af Primary=0.05 cfs 0.003 af Outflow=0.06 cfs 0.010 af

Pond 3P: Lot 3 WQ Drywell Peak Elev=96.86' Storage=0.001 af Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.007 af Primary=0.12 cfs 0.003 af Outflow=0.13 cfs 0.010 af

Pond 4P: Lot 4 WQ Drywell Peak Elev=97.86' Storage=0.001 af Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.008 af Primary=0.12 cfs 0.003 af Outflow=0.13 cfs 0.010 af

Pond 5P: Lot 5 WQ Drywell Peak Elev=99.61' Storage=0.001 af Inflow=0.13 cfs 0.010 af
Discarded=0.01 cfs 0.007 af Primary=0.12 cfs 0.003 af Outflow=0.13 cfs 0.010 af

Subcatchment 101: WPost-01 Runoff Area=0.079 ac 19.72% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=79 Runoff=0.09 cfs 0.007 af

Link 102: DP-1: Saugatucket Road - West Inflow=0.09 cfs 0.007 af
Primary=0.09 cfs 0.007 af

Subcatchment 201: WPost-02 Runoff Area=1.479 ac 3.22% Impervious Runoff Depth=0.74"
Flow Length=239' Tc=10.9 min CN=73 Runoff=0.97 cfs 0.091 af

Subcatchment 202: WPost-03 Runoff Area=0.361 ac 50.91% Impervious Runoff Depth=1.49"
Tc=6.0 min CN=86 Runoff=0.63 cfs 0.045 af

Subcatchment 203: WPost-04 Runoff Area=1.821 ac 27.95% Impervious Runoff Depth=1.16"
Flow Length=165' Tc=15.8 min CN=81 Runoff=1.80 cfs 0.176 af

Pond 204: Forebay A Peak Elev=95.80' Storage=845 cf Inflow=1.80 cfs 0.176 af
Primary=0.80 cfs 0.052 af Secondary=1.61 cfs 0.124 af Outflow=1.67 cfs 0.176 af

Subcatchment 205: WPost-05 Runoff Area=0.059 ac 0.00% Impervious Runoff Depth=0.78"
Tc=0.0 min CN=74 Runoff=0.06 cfs 0.004 af

Pond 206: WQ Infiltration Pond A Peak Elev=95.80' Storage=1,113 cf Inflow=0.83 cfs 0.056 af
Discarded=0.02 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.056 af

Subcatchment 207: WPost-06 Runoff Area=0.154 ac 0.00% Impervious Runoff Depth=0.78"
Tc=0.0 min CN=74 Runoff=0.16 cfs 0.010 af

Pond 208: Infiltration Pond A Peak Elev=95.63' Storage=3,581 cf Inflow=1.66 cfs 0.134 af
Discarded=0.08 cfs 0.134 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.134 af

Link 209: DP-2: Wetland A Inflow=1.47 cfs 0.136 af
Primary=1.47 cfs 0.136 af

Subcatchment L1: Lot 1 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment L2: Lot 2 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment L3: Lot 3 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment L4: Lot 4 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

Subcatchment L5: Lot 5 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=2.57"
Tc=6.0 min CN=98 Runoff=0.13 cfs 0.010 af

A3.5.4.2 HydroCAD 2-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Subcatchment 11: WPre-01 Runoff Area=0.088 ac 13.69% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=74 Runoff=0.11 cfs 0.008 af

Link 12: DP-1: Saugatcket Road - West Inflow=0.11 cfs 0.008 af
Primary=0.11 cfs 0.008 af

Subcatchment 21: WPre-02 Runoff Area=1.378 ac 3.47% Impervious Runoff Depth=0.89"
Flow Length=437' Tc=16.3 min CN=70 Runoff=0.94 cfs 0.102 af

Subcatchment 22: WPre-03 Runoff Area=1.815 ac 4.37% Impervious Runoff Depth=0.74"
Flow Length=454' Tc=8.8 min CN=67 Runoff=1.21 cfs 0.112 af

Subcatchment 23: WPre-04 Runoff Area=0.344 ac 0.00% Impervious Runoff Depth=0.65"
Flow Length=245' Tc=13.2 min CN=65 Runoff=0.16 cfs 0.019 af

Subcatchment 24: WPre-05 Runoff Area=0.318 ac 55.92% Impervious Runoff Depth=2.00"
Tc=6.0 min CN=87 Runoff=0.75 cfs 0.053 af

Link 25: DP-2: Wetland A Inflow=2.67 cfs 0.286 af
Primary=2.67 cfs 0.286 af

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Pond 1P: Lot 1 WQ Drywell Peak Elev=103.12' Storage=0.001 af Inflow=0.15 cfs 0.012 af
Discarded=0.01 cfs 0.008 af Primary=0.14 cfs 0.004 af Outflow=0.15 cfs 0.012 af

Pond 2P: Lot 2 WQ Drywell Peak Elev=96.08' Storage=0.003 af Inflow=0.15 cfs 0.012 af
Discarded=0.01 cfs 0.008 af Primary=0.08 cfs 0.004 af Outflow=0.08 cfs 0.012 af

Pond 3P: Lot 3 WQ Drywell Peak Elev=96.87' Storage=0.001 af Inflow=0.15 cfs 0.012 af
Discarded=0.01 cfs 0.008 af Primary=0.14 cfs 0.004 af Outflow=0.15 cfs 0.012 af

Pond 4P: Lot 4 WQ Drywell Peak Elev=97.87' Storage=0.001 af Inflow=0.15 cfs 0.012 af
Discarded=0.01 cfs 0.008 af Primary=0.14 cfs 0.004 af Outflow=0.15 cfs 0.012 af

Pond 5P: Lot 5 WQ Drywell Peak Elev=99.62' Storage=0.001 af Inflow=0.15 cfs 0.012 af
Discarded=0.01 cfs 0.008 af Primary=0.14 cfs 0.004 af Outflow=0.15 cfs 0.012 af

Subcatchment 101: WPost-01 Runoff Area=0.079 ac 19.72% Impervious Runoff Depth=1.41"
Tc=6.0 min CN=79 Runoff=0.13 cfs 0.009 af

Link 102: DP-1: Saugatucket Road - West Inflow=0.13 cfs 0.009 af
Primary=0.13 cfs 0.009 af

Subcatchment 201: WPost-02 Runoff Area=1.479 ac 3.22% Impervious Runoff Depth=1.05"
Flow Length=239' Tc=10.9 min CN=73 Runoff=1.45 cfs 0.129 af

Subcatchment 202: WPost-03 Runoff Area=0.361 ac 50.91% Impervious Runoff Depth=1.92"
Tc=6.0 min CN=86 Runoff=0.81 cfs 0.058 af

Subcatchment 203: WPost-04 Runoff Area=1.821 ac 27.95% Impervious Runoff Depth=1.55"
Flow Length=165' Tc=15.8 min CN=81 Runoff=2.43 cfs 0.235 af

Pond 204: Forebay A Peak Elev=95.84' Storage=886 cf Inflow=2.43 cfs 0.235 af
Primary=0.60 cfs 0.052 af Secondary=2.38 cfs 0.182 af Outflow=2.38 cfs 0.235 af

Subcatchment 205: WPost-05 Runoff Area=0.059 ac 0.00% Impervious Runoff Depth=1.10"
Tc=0.0 min CN=74 Runoff=0.09 cfs 0.005 af

Pond 206: WQ Infiltration Pond A Peak Elev=95.84' Storage=1,163 cf Inflow=0.67 cfs 0.058 af
Discarded=0.03 cfs 0.058 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.058 af

Subcatchment 207: WPost-06 Runoff Area=0.154 ac 0.00% Impervious Runoff Depth=1.10"
Tc=0.0 min CN=74 Runoff=0.23 cfs 0.014 af

Pond 208: Infiltration Pond A Peak Elev=95.81' Storage=4,248 cf Inflow=2.46 cfs 0.197 af
Discarded=0.09 cfs 0.160 af Primary=0.20 cfs 0.037 af Outflow=0.29 cfs 0.197 af

Link 209: DP-2: Wetland A Inflow=2.10 cfs 0.224 af
Primary=2.10 cfs 0.224 af

Subcatchment L1: Lot 1 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment L2: Lot 2 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment L3: Lot 3 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment L4: Lot 4 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

Subcatchment L5: Lot 5 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=98 Runoff=0.15 cfs 0.012 af

A3.5.4.3 HydroCAD 10-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Subcatchment 11: WPre-01 Runoff Area=0.088 ac 13.69% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=74 Runoff=0.23 cfs 0.017 af

Link 12: DP-1: Saugatcket Road - West Inflow=0.23 cfs 0.017 af
Primary=0.23 cfs 0.017 af

Subcatchment 21: WPre-02 Runoff Area=1.378 ac 3.47% Impervious Runoff Depth=1.96"
Flow Length=437' Tc=16.3 min CN=70 Runoff=2.27 cfs 0.225 af

Subcatchment 22: WPre-03 Runoff Area=1.815 ac 4.37% Impervious Runoff Depth=1.73"
Flow Length=454' Tc=8.8 min CN=67 Runoff=3.22 cfs 0.262 af

Subcatchment 23: WPre-04 Runoff Area=0.344 ac 0.00% Impervious Runoff Depth=1.59"
Flow Length=245' Tc=13.2 min CN=65 Runoff=0.48 cfs 0.045 af

Subcatchment 24: WPre-05 Runoff Area=0.318 ac 55.92% Impervious Runoff Depth=3.47"
Tc=6.0 min CN=87 Runoff=1.27 cfs 0.092 af

Link 25: DP-2: Wetland A Inflow=6.52 cfs 0.625 af
Primary=6.52 cfs 0.625 af

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Pond 1P: Lot 1 WQ Drywell Peak Elev=103.23' Storage=0.002 af Inflow=0.23 cfs 0.019 af
Discarded=0.01 cfs 0.010 af Primary=0.20 cfs 0.009 af Outflow=0.21 cfs 0.019 af

Pond 2P: Lot 2 WQ Drywell Peak Elev=96.12' Storage=0.004 af Inflow=0.23 cfs 0.019 af
Discarded=0.01 cfs 0.010 af Primary=0.15 cfs 0.009 af Outflow=0.15 cfs 0.019 af

Pond 3P: Lot 3 WQ Drywell Peak Elev=96.99' Storage=0.002 af Inflow=0.23 cfs 0.019 af
Discarded=0.01 cfs 0.010 af Primary=0.20 cfs 0.009 af Outflow=0.21 cfs 0.019 af

Pond 4P: Lot 4 WQ Drywell Peak Elev=97.99' Storage=0.002 af Inflow=0.23 cfs 0.019 af
Discarded=0.01 cfs 0.011 af Primary=0.20 cfs 0.008 af Outflow=0.21 cfs 0.019 af

Pond 5P: Lot 5 WQ Drywell Peak Elev=99.73' Storage=0.002 af Inflow=0.23 cfs 0.019 af
Discarded=0.01 cfs 0.011 af Primary=0.20 cfs 0.008 af Outflow=0.21 cfs 0.019 af

Subcatchment 101: WPost-01 Runoff Area=0.079 ac 19.72% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=79 Runoff=0.25 cfs 0.018 af

Link 102: DP-1: Saugatucket Road - West Inflow=0.25 cfs 0.018 af
Primary=0.25 cfs 0.018 af

Subcatchment 201: WPost-02 Runoff Area=1.479 ac 3.22% Impervious Runoff Depth=2.20"
Flow Length=239' Tc=10.9 min CN=73 Runoff=3.21 cfs 0.271 af

Subcatchment 202: WPost-03 Runoff Area=0.361 ac 50.91% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=86 Runoff=1.41 cfs 0.101 af

Subcatchment 203: WPost-04 Runoff Area=1.821 ac 27.95% Impervious Runoff Depth=2.90"
Flow Length=165' Tc=15.8 min CN=81 Runoff=4.58 cfs 0.440 af

Pond 204: Forebay A Peak Elev=96.10' Storage=1,168 cf Inflow=4.58 cfs 0.440 af
Primary=0.33 cfs 0.052 af Secondary=4.38 cfs 0.388 af Outflow=4.46 cfs 0.440 af

Subcatchment 205: WPost-05 Runoff Area=0.059 ac 0.00% Impervious Runoff Depth=2.28"
Tc=0.0 min CN=74 Runoff=0.19 cfs 0.011 af

Pond 206: WQ Infiltration Pond A Peak Elev=96.10' Storage=1,457 cf Inflow=0.39 cfs 0.063 af
Discarded=0.03 cfs 0.063 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.063 af

Subcatchment 207: WPost-06 Runoff Area=0.154 ac 0.00% Impervious Runoff Depth=2.28"
Tc=0.0 min CN=74 Runoff=0.50 cfs 0.029 af

Pond 208: Infiltration Pond A Peak Elev=96.09' Storage=5,303 cf Inflow=4.57 cfs 0.417 af
Discarded=0.09 cfs 0.180 af Primary=2.80 cfs 0.236 af Outflow=2.89 cfs 0.417 af

Link 209: DP-2: Wetland A Inflow=4.88 cfs 0.609 af
Primary=4.88 cfs 0.609 af

Subcatchment L1: Lot 1 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.019 af

Subcatchment L2: Lot 2 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.019 af

Subcatchment L3: Lot 3 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.019 af

Subcatchment L4: Lot 4 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.019 af

Subcatchment L5: Lot 5 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=4.66"
Tc=6.0 min CN=98 Runoff=0.23 cfs 0.019 af

A3.5.4.4 HydroCAD 25-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Subcatchment 11: WPre-01 Runoff Area=0.088 ac 13.69% Impervious Runoff Depth=3.27"
Tc=6.0 min CN=74 Runoff=0.34 cfs 0.024 af

Link 12: DP-1: Saugatcket Road - West Inflow=0.34 cfs 0.024 af
Primary=0.34 cfs 0.024 af

Subcatchment 21: WPre-02 Runoff Area=1.378 ac 3.47% Impervious Runoff Depth=2.88"
Flow Length=437' Tc=16.3 min CN=70 Runoff=3.39 cfs 0.331 af

Subcatchment 22: WPre-03 Runoff Area=1.815 ac 4.37% Impervious Runoff Depth=2.61"
Flow Length=454' Tc=8.8 min CN=67 Runoff=4.96 cfs 0.394 af

Subcatchment 23: WPre-04 Runoff Area=0.344 ac 0.00% Impervious Runoff Depth=2.42"
Flow Length=245' Tc=13.2 min CN=65 Runoff=0.76 cfs 0.069 af

Subcatchment 24: WPre-05 Runoff Area=0.318 ac 55.92% Impervious Runoff Depth=4.61"
Tc=6.0 min CN=87 Runoff=1.67 cfs 0.122 af

Link 25: DP-2: Wetland A Inflow=9.80 cfs 0.917 af
Primary=9.80 cfs 0.917 af

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Pond 1P: Lot 1 WQ Drywell Peak Elev=103.34' Storage=0.002 af Inflow=0.28 cfs 0.023 af
Discarded=0.01 cfs 0.011 af Primary=0.25 cfs 0.012 af Outflow=0.25 cfs 0.023 af

Pond 2P: Lot 2 WQ Drywell Peak Elev=96.16' Storage=0.004 af Inflow=0.28 cfs 0.023 af
Discarded=0.01 cfs 0.011 af Primary=0.17 cfs 0.012 af Outflow=0.17 cfs 0.023 af

Pond 3P: Lot 3 WQ Drywell Peak Elev=97.10' Storage=0.002 af Inflow=0.28 cfs 0.023 af
Discarded=0.01 cfs 0.011 af Primary=0.25 cfs 0.012 af Outflow=0.26 cfs 0.023 af

Pond 4P: Lot 4 WQ Drywell Peak Elev=98.11' Storage=0.002 af Inflow=0.28 cfs 0.023 af
Discarded=0.01 cfs 0.012 af Primary=0.25 cfs 0.011 af Outflow=0.26 cfs 0.023 af

Pond 5P: Lot 5 WQ Drywell Peak Elev=99.84' Storage=0.002 af Inflow=0.28 cfs 0.023 af
Discarded=0.01 cfs 0.012 af Primary=0.25 cfs 0.011 af Outflow=0.25 cfs 0.023 af

Subcatchment 101: WPost-01 Runoff Area=0.079 ac 19.72% Impervious Runoff Depth=3.77"
Tc=6.0 min CN=79 Runoff=0.35 cfs 0.025 af

Link 102: DP-1: Saugatucket Road - West Inflow=0.35 cfs 0.025 af
Primary=0.35 cfs 0.025 af

Subcatchment 201: WPost-02 Runoff Area=1.479 ac 3.22% Impervious Runoff Depth=3.17"
Flow Length=239' Tc=10.9 min CN=73 Runoff=4.67 cfs 0.391 af

Subcatchment 202: WPost-03 Runoff Area=0.361 ac 50.91% Impervious Runoff Depth=4.50"
Tc=6.0 min CN=86 Runoff=1.86 cfs 0.135 af

Subcatchment 203: WPost-04 Runoff Area=1.821 ac 27.95% Impervious Runoff Depth=3.97"
Flow Length=165' Tc=15.8 min CN=81 Runoff=6.26 cfs 0.603 af

Pond 204: Forebay A Peak Elev=96.26' Storage=1,386 cf Inflow=6.26 cfs 0.603 af
Primary=0.53 cfs 0.051 af Secondary=5.31 cfs 0.552 af Outflow=5.76 cfs 0.603 af

Subcatchment 205: WPost-05 Runoff Area=0.059 ac 0.00% Impervious Runoff Depth=3.27"
Tc=0.0 min CN=74 Runoff=0.28 cfs 0.016 af

Pond 206: WQ Infiltration Pond A Peak Elev=96.27' Storage=1,670 cf Inflow=0.64 cfs 0.067 af
Discarded=0.03 cfs 0.067 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.067 af

Subcatchment 207: WPost-06 Runoff Area=0.154 ac 0.00% Impervious Runoff Depth=3.27"
Tc=0.0 min CN=74 Runoff=0.72 cfs 0.042 af

Pond 208: Infiltration Pond A Peak Elev=96.23' Storage=5,896 cf Inflow=5.55 cfs 0.594 af
Discarded=0.09 cfs 0.189 af Primary=5.04 cfs 0.405 af Outflow=5.13 cfs 0.594 af

Link 209: DP-2: Wetland A Inflow=8.90 cfs 0.932 af
Primary=8.90 cfs 0.932 af

Subcatchment L1: Lot 1 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

Subcatchment L2: Lot 2 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

Subcatchment L3: Lot 3 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

Subcatchment L4: Lot 4 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

Subcatchment L5: Lot 5 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=98 Runoff=0.28 cfs 0.023 af

A3.5.4.5 HydroCAD 100-Year Storm Analysis

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Subcatchment 11: WPre-01 Runoff Area=0.088 ac 13.69% Impervious Runoff Depth=5.38"
Tc=6.0 min CN=74 Runoff=0.55 cfs 0.039 af

Link 12: DP-1: Saugatcket Road - West Inflow=0.55 cfs 0.039 af
Primary=0.55 cfs 0.039 af

Subcatchment 21: WPre-02 Runoff Area=1.378 ac 3.47% Impervious Runoff Depth=4.90"
Flow Length=437' Tc=16.3 min CN=70 Runoff=5.80 cfs 0.562 af

Subcatchment 22: WPre-03 Runoff Area=1.815 ac 4.37% Impervious Runoff Depth=4.54"
Flow Length=454' Tc=8.8 min CN=67 Runoff=8.77 cfs 0.687 af

Subcatchment 23: WPre-04 Runoff Area=0.344 ac 0.00% Impervious Runoff Depth=4.30"
Flow Length=245' Tc=13.2 min CN=65 Runoff=1.37 cfs 0.123 af

Subcatchment 24: WPre-05 Runoff Area=0.318 ac 55.92% Impervious Runoff Depth=6.94"
Tc=6.0 min CN=87 Runoff=2.46 cfs 0.184 af

Link 25: DP-2: Wetland A Inflow=16.87 cfs 1.556 af
Primary=16.87 cfs 1.556 af

Summary for Subcatchment 11: WPre-01

Runoff = 0.55 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 5.38"
Routed to Link 12 : DP-1: Saugatcket Road - West

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.038	74	>75% Grass cover, Good, HSG C
0.019	65	Brush, Good, HSG C
0.012	98	Offsite Impervious, HSG C
0.018	70	Woods, Good, HSG C
0.088	74	Weighted Average
0.076	71	86.31% Pervious Area
0.012	98	13.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Link 12: DP-1: Saugatcket Road - West

Inflow Area = 0.088 ac, 13.69% Impervious, Inflow Depth = 5.38" for 100-Year event
Inflow = 0.55 cfs @ 12.09 hrs, Volume= 0.039 af
Primary = 0.55 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 21: WPre-02

Runoff = 5.80 cfs @ 12.22 hrs, Volume= 0.562 af, Depth= 4.90"
Routed to Link 25 : DP-2: Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.460	74	>75% Grass cover, Good, HSG C
0.699	65	Brush, Good, HSG C
0.038	98	Impervious, HSG C
0.009	98	Roofs, HSG C
0.172	70	Woods, Good, HSG C
1.378	70	Weighted Average
1.330	69	96.53% Pervious Area
0.048	98	3.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow, A**
					Grass: Dense n= 0.240 P2= 3.30"
2.2	337	0.0261	2.60		**Shallow Concentrated Flow, B**
					Unpaved Kv= 16.1 fps
16.3	437	Total			

Summary for Subcatchment 22: WPre-03

Runoff = 8.77 cfs @ 12.13 hrs, Volume= 0.687 af, Depth= 4.54"
Routed to Link 25 : DP-2: Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.194	74	>75% Grass cover, Good, HSG C
1.510	65	Brush, Good, HSG C
0.034	98	Impervious, HSG C
0.045	98	Roofs, HSG C
0.032	70	Woods, Good, HSG C
1.815	67	Weighted Average
1.736	66	95.63% Pervious Area
0.079	98	4.37% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1	44	0.0318	0.12		**Sheet Flow, A**
					Grass: Dense n= 0.240 P2= 3.30"
0.1	18	0.0278	3.38		**Shallow Concentrated Flow, B**
					Paved Kv= 20.3 fps
2.6	392	0.0242	2.50		**Shallow Concentrated Flow, C**
					Unpaved Kv= 16.1 fps
8.8	454	Total			

Summary for Subcatchment 23: WPre-04

Runoff = 1.37 cfs @ 12.19 hrs, Volume= 0.123 af, Depth= 4.30"
Routed to Link 25 : DP-2: Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.012	74	>75% Grass cover, Good, HSG C
0.332	65	Brush, Good, HSG C
0.344	65	Weighted Average
0.344	65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	100	0.0290	0.14		**Sheet Flow, A**
					Grass: Dense n= 0.240 P2= 3.30"
1.1	145	0.0193	2.24		**Shallow Concentrated Flow, B**
					Unpaved Kv= 16.1 fps
13.2	245	Total			

Summary for Subcatchment 24: WPre-05

Runoff = 2.46 cfs @ 12.08 hrs, Volume= 0.184 af, Depth= 6.94"
Routed to Link 25 : DP-2: Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.136	74	>75% Grass cover, Good, HSG C
0.000	65	Brush, Good, HSG C
0.001	98	Impervious, HSG C
0.177	98	Offsite Impervious, HSG C
0.004	70	Woods, Good, HSG C
0.318	87	Weighted Average
0.140	74	44.08% Pervious Area
0.178	98	55.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Link 25: DP-2: Wetland A

Inflow Area = 3.855 ac, 7.91% Impervious, Inflow Depth = 4.84" for 100-Year event
Inflow = 16.87 cfs @ 12.14 hrs, Volume= 1.556 af
Primary = 16.87 cfs @ 12.14 hrs, Volume= 1.556 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Pond 1P: Lot 1 WQ Drywell Peak Elev=103.62' Storage=0.002 af Inflow=0.40 cfs 0.033 af
Discarded=0.01 cfs 0.013 af Primary=0.33 cfs 0.020 af Outflow=0.34 cfs 0.033 af

Pond 2P: Lot 2 WQ Drywell Peak Elev=96.23' Storage=0.006 af Inflow=0.40 cfs 0.033 af
Discarded=0.01 cfs 0.013 af Primary=0.20 cfs 0.020 af Outflow=0.21 cfs 0.033 af

Pond 3P: Lot 3 WQ Drywell Peak Elev=97.39' Storage=0.002 af Inflow=0.40 cfs 0.033 af
Discarded=0.01 cfs 0.013 af Primary=0.34 cfs 0.020 af Outflow=0.34 cfs 0.033 af

Pond 4P: Lot 4 WQ Drywell Peak Elev=98.41' Storage=0.002 af Inflow=0.40 cfs 0.033 af
Discarded=0.01 cfs 0.014 af Primary=0.34 cfs 0.018 af Outflow=0.35 cfs 0.033 af

Pond 5P: Lot 5 WQ Drywell Peak Elev=100.12' Storage=0.002 af Inflow=0.40 cfs 0.033 af
Discarded=0.01 cfs 0.014 af Primary=0.33 cfs 0.019 af Outflow=0.34 cfs 0.033 af

Subcatchment 101: WPost-01 Runoff Area=0.079 ac 19.72% Impervious Runoff Depth=5.98"
Tc=6.0 min CN=79 Runoff=0.54 cfs 0.039 af

Link 102: DP-1: Saugatucket Road - West Inflow=0.54 cfs 0.039 af
Primary=0.54 cfs 0.039 af

Subcatchment 201: WPost-02 Runoff Area=1.479 ac 3.22% Impervious Runoff Depth=5.26"
Flow Length=239' Tc=10.9 min CN=73 Runoff=7.73 cfs 0.648 af

Subcatchment 202: WPost-03 Runoff Area=0.361 ac 50.91% Impervious Runoff Depth=6.82"
Tc=6.0 min CN=86 Runoff=2.75 cfs 0.205 af

Subcatchment 203: WPost-04 Runoff Area=1.821 ac 27.95% Impervious Runoff Depth=6.22"
Flow Length=165' Tc=15.8 min CN=81 Runoff=9.66 cfs 0.943 af

Pond 204: Forebay A Peak Elev=96.47' Storage=1,735 cf Inflow=9.66 cfs 0.943 af
Primary=0.36 cfs 0.049 af Secondary=8.97 cfs 0.894 af Outflow=9.22 cfs 0.943 af

Subcatchment 205: WPost-05 Runoff Area=0.059 ac 0.00% Impervious Runoff Depth=5.38"
Tc=0.0 min CN=74 Runoff=0.45 cfs 0.026 af

Pond 206: WQ Infiltration Pond A Peak Elev=96.51' Storage=1,972 cf Inflow=0.53 cfs 0.076 af
Discarded=0.03 cfs 0.075 af Primary=0.02 cfs 0.001 af Outflow=0.05 cfs 0.076 af

Subcatchment 207: WPost-06 Runoff Area=0.154 ac 0.00% Impervious Runoff Depth=5.38"
Tc=0.0 min CN=74 Runoff=1.18 cfs 0.069 af

Pond 208: Infiltration Pond A Peak Elev=96.43' Storage=6,701 cf Inflow=9.35 cfs 0.963 af
Discarded=0.10 cfs 0.200 af Primary=8.90 cfs 0.763 af Outflow=8.99 cfs 0.963 af

Link 209: DP-2: Wetland A Inflow=16.52 cfs 1.616 af
Primary=16.52 cfs 1.616 af

Subcatchment L1: Lot 1 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Subcatchment L2: Lot 2 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Subcatchment L3: Lot 3 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Subcatchment L4: Lot 4 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Subcatchment L5: Lot 5 Roof Runoff Area=2,076 sf 100.00% Impervious Runoff Depth=8.26"
Tc=6.0 min CN=98 Runoff=0.40 cfs 0.033 af

Summary for Pond 1P: Lot 1 WQ Drywell

Inflow Area = 0.048 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af
Outflow = 0.34 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 15%, Lag= 2.9 min
Discarded = 0.01 cfs @ 7.63 hrs, Volume= 0.013 af
Primary = 0.33 cfs @ 12.13 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 103.62' @ 12.13 hrs Surf.Area= 0.007 ac Storage= 0.002 af

Plug-Flow detention time= 28.3 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 28.3 min (768.8 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	101.50'	0.001 af	**18.00'W x 18.00'L x 0.50'H Drywell** 0.004 af Overall x 33.3% Voids
#2	103.00'	0.002 af	**9.00'W x 9.00'L x 1.00'H Above Drywell** -Impervious
		0.003 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.50'	**1.055 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	103.00'	**4.00" Horiz. 4" Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 7.63 hrs HW=101.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.13 hrs HW=103.62' (Free Discharge)
↑—**2=4" Outlet** (Orifice Controls 0.33 cfs @ 3.80 fps)

Summary for Pond 2P: Lot 2 WQ Drywell

Inflow Area = 0.048 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af
Outflow = 0.21 cfs @ 12.21 hrs, Volume= 0.033 af, Atten= 47%, Lag= 7.7 min
Discarded = 0.01 cfs @ 7.35 hrs, Volume= 0.013 af
Primary = 0.20 cfs @ 12.21 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.23' @ 12.21 hrs Surf.Area= 0.008 ac Storage= 0.006 af

Plug-Flow detention time= 41.2 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 41.2 min (781.7 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	94.50'	0.001 af	**11.00'W x 30.00'L x 0.50'H Drywell** 0.004 af Overall x 33.3% Voids
#2	96.00'	0.010 af	**30.00'W x 30.00'L x 0.50'H Above Drywell** -Impervious
		0.012 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.50'	**0.990 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	96.00'	**4.00" Horiz. 4" Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 7.35 hrs HW=94.52' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.20 cfs @ 12.21 hrs HW=96.23' (Free Discharge)
2=4" Outlet (Orifice Controls 0.20 cfs @ 2.31 fps)

Summary for Pond 3P: Lot 3 WQ Drywell

Inflow Area = 0.048 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af
Outflow = 0.34 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 13%, Lag= 2.8 min
Discarded = 0.01 cfs @ 7.82 hrs, Volume= 0.013 af
Primary = 0.34 cfs @ 12.13 hrs, Volume= 0.020 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 97.39' @ 12.13 hrs Surf.Area= 0.008 ac Storage= 0.002 af

Plug-Flow detention time= 30.0 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 30.0 min (770.4 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	94.25'	0.001 af	**11.00'W x 30.00'L x 0.50'H Drywell** 0.004 af Overall x 33.3% Voids
#2	96.75'	0.003 af	**9.00'W x 8.00'L x 2.00'H Above Drywell** -Impervious
		0.005 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.25'	**0.990 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	96.75'	**4.00" Horiz. 4" Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 7.82 hrs HW=94.30' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.34 cfs @ 12.13 hrs HW=97.39' (Free Discharge)
2=4" Outlet (Orifice Controls 0.34 cfs @ 3.86 fps)

Summary for Pond 4P: Lot 4 WQ Drywell

Inflow Area = 0.048 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af
Outflow = 0.35 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 12%, Lag= 2.6 min
Discarded = 0.01 cfs @ 8.50 hrs, Volume= 0.014 af
Primary = 0.34 cfs @ 12.13 hrs, Volume= 0.018 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Peak Elev= 98.41' @ 12.13 hrs Surf.Area= 0.007 ac Storage= 0.002 af

Plug-Flow detention time= 23.5 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 23.5 min (764.0 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	96.25'	0.001 af	**18.00'W x 18.00'L x 0.50'H Drywell** 0.004 af Overall x 33.3% Voids
#2	97.75'	0.003 af	**8.00'W x 8.00'L x 2.00'H Above Drywell** -Impervious
		0.004 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	96.25'	**1.280 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	97.75'	**4.00" Horiz. 4" Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.50 hrs HW=96.29' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.34 cfs @ 12.13 hrs HW=98.41' (Free Discharge)
2=4" Outlet (Orifice Controls 0.34 cfs @ 3.90 fps)

Summary for Pond 5P: Lot 5 WQ Drywell

Inflow Area = 0.048 ac,100.00% Impervious, Inflow Depth = 8.26" for 100-Year event
Inflow = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af
Outflow = 0.34 cfs @ 12.13 hrs, Volume= 0.033 af, Atten= 15%, Lag= 2.9 min
Discarded = 0.01 cfs @ 8.19 hrs, Volume= 0.014 af
Primary = 0.33 cfs @ 12.13 hrs, Volume= 0.019 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 100.12' @ 12.13 hrs Surf.Area= 0.007 ac Storage= 0.002 af

Plug-Flow detention time= 24.9 min calculated for 0.033 af (100% of inflow)
Center-of-Mass det. time= 24.8 min (765.3 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	98.00'	0.001 af	**18.00'W x 18.00'L x 0.50'H Drywell** 0.004 af Overall x 33.3% Voids
#2	99.50'	0.002 af	**9.00'W x 9.00'L x 1.00'H Above Drywell** -Impervious
		0.003 af	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Discarded	98.00'	**1.215 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	99.50'	**4.00" Horiz. 4" Outlet** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 8.19 hrs HW=98.03' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.13 hrs HW=100.12' (Free Discharge)
2=4" Outlet (Orifice Controls 0.33 cfs @ 3.78 fps)

Summary for Subcatchment 101: WPost-01

Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af, Depth= 5.98"
Routed to Link 102 : DP-1: Saugatucket Road - West

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.063	74	>75% Grass cover, Good, HSG C
0.000	98	Impervious, HSG C
0.015	98	Offsite Impervious, HSG C
0.079	79	Weighted Average
0.063	74	80.28% Pervious Area
0.016	98	19.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Link 102: DP-1: Saugatucket Road - West

Inflow Area = 0.079 ac, 19.72% Impervious, Inflow Depth = 5.98" for 100-Year event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af
Primary = 0.54 cfs @ 12.09 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 201: WPost-02

Runoff = 7.73 cfs @ 12.15 hrs, Volume= 0.648 af, Depth= 5.26"
Routed to Link 209 : DP-2: Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
1.081	74	>75% Grass cover, Good, HSG C
0.280	65	Brush, Good, HSG C
0.048	98	Roofs, HSG C
0.070	70	Woods, Good, HSG C
1.479	73	Weighted Average
1.432	72	96.78% Pervious Area
0.048	98	3.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.0460	0.17		**Sheet Flow, A**
					Grass: Dense n= 0.240 P2= 3.30"
0.8	139	0.0315	2.86		**Shallow Concentrated Flow, B**
					Unpaved Kv= 16.1 fps
10.9	239	Total			

Summary for Subcatchment 202: WPost-03

Runoff = 2.75 cfs @ 12.08 hrs, Volume= 0.205 af, Depth= 6.82"
Routed to Link 209 : DP-2: Wetland A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.150	74	>75% Grass cover, Good, HSG C
0.027	65	Brush, Good, HSG C
0.003	98	Impervious, HSG C
0.180	98	Offsite Impervious, HSG C
0.361	86	Weighted Average
0.177	73	49.09% Pervious Area
0.184	98	50.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment 203: WPost-04

Runoff = 9.66 cfs @ 12.21 hrs, Volume= 0.943 af, Depth= 6.22"
Routed to Pond 204 : Forebay A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
1.312	74	>75% Grass cover, Good, HSG C
0.318	98	Impervious, HSG C
0.191	98	Roofs, HSG C
1.821	81	Weighted Average
1.312	74	72.05% Pervious Area
0.509	98	27.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	100	0.0160	0.11		**Sheet Flow, A** Grass: Dense n= 0.240 P2= 3.30"
0.4	65	0.0368	3.09		**Shallow Concentrated Flow, B** Unpaved Kv= 16.1 fps
15.8	165	Total			

Summary for Pond 204: Forebay A

Inflow Area = 1.821 ac, 27.95% Impervious, Inflow Depth = 6.22" for 100-Year event
Inflow = 9.66 cfs @ 12.21 hrs, Volume= 0.943 af
Outflow = 9.22 cfs @ 12.23 hrs, Volume= 0.943 af, Atten= 5%, Lag= 1.1 min
Primary = 0.36 cfs @ 12.17 hrs, Volume= 0.049 af
Routed to Pond 206 : WQ Infiltration Pond A
Secondary = 8.97 cfs @ 12.24 hrs, Volume= 0.894 af
Routed to Pond 208 : Infiltration Pond A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 95.00' Surf.Area= 311 sf Storage= 376 cf
Peak Elev= 96.47' @ 12.29 hrs Surf.Area= 1,849 sf Storage= 1,735 cf (1,359 cf above start)

Plug-Flow detention time= 25.2 min calculated for 0.934 af (99% of inflow)
Center-of-Mass det. time= 15.9 min (823.3 - 807.4)

Volume	Invert	Avail.Storage	Storage Description
#1	93.00'	2,990 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.00	88	43.1	0	0	88
95.00	311	310.8	376	376	7,635
96.00	1,118	248.0	673	1,049	10,442
97.00	2,904	393.0	1,941	2,990	17,845

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	**6.00" Round Culverts X 3.00** L= 20.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 95.00' / 94.50' S= 0.0250 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#2	Secondary	95.65'	**10.0' 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

Primary OutFlow Max=0.24 cfs @ 12.17 hrs HW=96.38' TW=96.37' (Dynamic Tailwater)
1=Culverts (Inlet Controls 0.24 cfs @ 0.41 fps)

Secondary OutFlow Max=8.41 cfs @ 12.24 hrs HW=96.45' TW=96.41' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 8.41 cfs @ 1.05 fps)

Summary for Subcatchment 205: WPost-05

Runoff = 0.45 cfs @ 12.00 hrs, Volume= 0.026 af, Depth= 5.38"
Routed to Pond 206 : WQ Infiltration Pond A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.059	74	>75% Grass cover, Good, HSG C
0.059	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					**Direct Entry,**

Summary for Pond 206: WQ Infiltration Pond A

Inflow Area = 1.880 ac, 27.07% Impervious, Inflow Depth = 0.48" for 100-Year event
Inflow = 0.53 cfs @ 12.17 hrs, Volume= 0.076 af
Outflow = 0.05 cfs @ 12.57 hrs, Volume= 0.076 af, Atten= 91%, Lag= 24.2 min
Discarded = 0.03 cfs @ 12.57 hrs, Volume= 0.075 af
Primary = 0.02 cfs @ 12.57 hrs, Volume= 0.001 af
Routed to Pond 208 : Infiltration Pond A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.51' @ 12.57 hrs Surf.Area= 1,339 sf Storage= 1,972 cf

Plug-Flow detention time= 659.9 min calculated for 0.076 af (100% of inflow)
Center-of-Mass det. time= 659.9 min (1,453.1 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1	94.50'	2,675 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.50	626	0	0
97.00	1,514	2,675	2,675

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.50'	**0.990 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	96.50'	**10.0' long x 14.5' breadth Overflow Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.66 2.69 2.70 2.65 2.63 2.65 2.64 2.63

Discarded OutFlow Max=0.03 cfs @ 12.57 hrs HW=96.51' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.02 cfs @ 12.57 hrs HW=96.51' TW=96.25' (Dynamic Tailwater)
↑—**2=Overflow Weir** (Weir Controls 0.02 cfs @ 0.23 fps)

Summary for Subcatchment 207: WPost-06

Runoff = 1.18 cfs @ 12.00 hrs, Volume= 0.069 af, Depth= 5.38"
Routed to Pond 208 : Infiltration Pond A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
0.154	74	>75% Grass cover, Good, HSG C
0.154	74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0					**Direct Entry,**

Summary for Pond 208: Infiltration Pond A

Inflow Area = 2.034 ac, 25.03% Impervious, Inflow Depth = 5.68" for 100-Year event
Inflow = 9.35 cfs @ 12.24 hrs, Volume= 0.963 af
Outflow = 8.99 cfs @ 12.29 hrs, Volume= 0.963 af, Atten= 4%, Lag= 3.2 min
Discarded = 0.10 cfs @ 12.29 hrs, Volume= 0.200 af
Primary = 8.90 cfs @ 12.29 hrs, Volume= 0.763 af
Routed to Link 209 : DP-2: Wetland A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.43' @ 12.29 hrs Surf.Area= 4,172 sf Storage= 6,701 cf

Plug-Flow detention time= 129.2 min calculated for 0.963 af (100% of inflow)
Center-of-Mass det. time= 129.3 min (953.4 - 824.2)

Volume	Invert	Avail.Storage	Storage Description
#1	94.50'	9,194 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.50	2,769	0	0
97.00	4,586	9,194	9,194

Device	Routing	Invert	Outlet Devices
#1	Discarded	94.50'	**0.990 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	95.75'	**5.0' long x 0.5' breadth 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=0.10 cfs @ 12.29 hrs HW=96.43' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=8.90 cfs @ 12.29 hrs HW=96.43' TW=0.00' (Dynamic Tailwater)
↑—**2=Weir** (Weir Controls 8.90 cfs @ 2.61 fps)

Summary for Link 209: DP-2: Wetland A

Inflow Area = 3.873 ac, 19.11% Impervious, Inflow Depth = 5.01" for 100-Year event
Inflow = 16.52 cfs @ 12.18 hrs, Volume= 1.616 af
Primary = 16.52 cfs @ 12.18 hrs, Volume= 1.616 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment L1: Lot 1 Roof

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 8.26"
Routed to Pond 1P : Lot 1 WQ Drywell

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (sf)	CN	Description
2,076	98	Roofs, HSG C
2,076	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment L2: Lot 2 Roof

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 8.26"
Routed to Pond 2P : Lot 2 WQ Drywell

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (sf)	CN	Description
2,076	98	Roofs, HSG C
2,076	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment L3: Lot 3 Roof

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 8.26"
Routed to Pond 3P : Lot 3 WQ Drywell

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (sf)	CN	Description
2,076	98	Roofs, HSG C
2,076	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment L4: Lot 4 Roof

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 8.26"
Routed to Pond 4P : Lot 4 WQ Drywell

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (sf)	CN	Description
2,076	98	Roofs, HSG C
2,076	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Summary for Subcatchment L5: Lot 5 Roof

Runoff = 0.40 cfs @ 12.08 hrs, Volume= 0.033 af, Depth= 8.26"
Routed to Pond 5P : Lot 5 WQ Drywell

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (sf)	CN	Description
2,076	98	Roofs, HSG C
2,076	98	100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

A3.5.4.6 HydroCAD 100-Year Emergency Outlet Calculations

Summary for Pond 208: Infiltration Pond A

Inflow Area = 2.034 ac, 25.03% Impervious, Inflow Depth = 5.67" for 100-Year event
Inflow = 9.36 cfs @ 12.23 hrs, Volume= 0.961 af
Outflow = 9.01 cfs @ 12.29 hrs, Volume= 0.869 af, Atten= 4%, Lag= 3.2 min
Primary = 9.01 cfs @ 12.29 hrs, Volume= 0.869 af
Routed to Link 209 : DP-2: Wetland A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 96.44' @ 12.29 hrs Surf.Area= 4,176 sf Storage= 6,722 cf

Plug-Flow detention time= 75.8 min calculated for 0.869 af (90% of inflow)
Center-of-Mass det. time= 28.8 min (851.8 - 823.1)

Volume	Invert	Avail.Storage	Storage Description
#1	94.50'	9,194 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
94.50	2,769	0	0
97.00	4,586	9,194	9,194

Device	Routing	Invert	Outlet Devices
#1	Primary	95.75'	**5.0' long x 0.5' breadth 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

Primary OutFlow Max=9.01 cfs @ 12.29 hrs HW=96.44' TW=0.00' (Dynamic Tailwater)
↑**1=Weir** (Weir Controls 9.01 cfs @ 2.63 fps)

Appendix B – Mounding Calculations

DiPrete Engineering has prepared groundwater mounding calculations for the proposed infiltration pond. The infiltration pond has been designed to infiltrate stormwater as well as release stormwater through a weir.

DiPrete Engineering has calculated the groundwater mounding using the USGS Hantush Calculator. The calculator is available online at http://pubs.usgs.gov/sir/2010/5102/.

The calculator provided by the USGS requires several variables:

R – Recharge infiltration rate (feet/day):
Recharge rate is the vertical conductivity (Kv) of the soil. The vertical conductivity was determined based on soil texture and table 5-3 in section 5.3.4 of the RISDISM of the RISDISM. A value of 0.99 in/hr or 1.98 ft/day has been used for these calculations.

Sy – Specific Yield:
Specific Yield is specific to the parent material through which the infiltration occurs. Onsite soil evaluations classified the soils as silt. A value for Sy has been obtained from Table 4.3 of Hydrology and Hydraulic Systems by Ram S. Gupta:

TABLE 4.3 REPRESENTATIVE VALUES OF SPECIFIC YIELD FOR SOILS AND ROCKS

Material	Specific Yield (%)
Gravel, coarse	23
Gravel, medium	24
Gravel, fine	25
Sand, coarse	27
Sand, medium	28
Sand, fine	23
Silt	8
Clay	3
Sandstone, fine-grained	21
Sandstone, medium-grained	27
Limestone	14
Dune sand	38
Loess	18
Peat	44
Schist	26
Siltstone	12
Till, predominantly silt	6
Till, predominantly sand	16
Till, predominantly gravel	16
Tuff	21

Source: Todd, 1980.

HYDROLOGY & HYDRAULIC SYSTEMS

RAM S. GUPTA, Ph.D., P.E.
Roger Williams University, Bristol, RI
Dirita Engineers, Inc., Bristol, RI

K – Hydraulic conductivity, Kh (feet/day):
Mounding calculations require the hydraulic conductivity (Kh) value of the soils. According to USGS SIR 2010-5102, Vertical Conductivity is approximately 1/10 of horizontal conductivity. The vertical conductivity was determined based on infiltration tests. The vertical conductivity is 0.99 in/hr, which equates to a horizontal conductivity of 9.9 in/hr or 19.8 ft/day.

x & y – ½ of the basin length:
The x and y variables represent the length and width of the system. The overall system is approximately 84' x 33' and the ½ basin length and width is 42' x 16.5'.

t – Duration of infiltration period in (days):
The time of infiltration is calculated from volume infiltrated dived by the square footage of the pond and the infiltration rate (Kv).

Volume Infiltrated (af)	Pond Infiltrating Surface Area (sf)	Infiltration Rate (ft/day)	T (days)
0.202	2,769	0.99	1.7

hi(0) – initial thickness of saturated zone (feet):
The initial thickness of the saturated zone is the depth from the water table to the impervious limiting layer. Test holes performed did not encounter ledge. Test holes reached a total depth of 10'. To be conservative, the impervious limiting layer is considered to be the bottom of the test hole. Ledge could be significantly deeper in the area of the infiltration pond, but based on available data we have assumed the bottom of the test hole.

Conclusion:

System Bottom	System Top	100-Year Mound height (ft)	100-Year Mound Elevation	25-Year Mound height (ft)	25-Year Mound Elevation
94.50	97.50	4.41	96.91	4.31	96.81

The mounding height is obtained from the USGS Hantush Calculator. The mound elevation is determined by adding the mound height to the average seasonal high groundwater for each respective storm system.

During the 25- and 100-year storms the mound will come into the basin bottom for a short period during the storm event. DiPrete Engineering reviewed the infiltration pond calculations for larger storm events with no infiltration occurring. Since the infiltration pond has an outlet to the wetland, DiPrete Engineering reviewed the impacts to the wetland during all storm events. DiPrete Engineering determined that the peak runoff rate to the wetland for the 25- and 100-year storms remain mitigated when considering the reduced infiltration and volume which could be encountered should the groundwater mound enter the infiltration pond bottom. This is a conservative approach since the mound wouldn't instantly occur during the storm event and wouldn't last for the entire duration of the storm. This scenario is a worst-case scenario with larger storm events occurring at a time where the water table is at a seasonal high elevation.

The following table summarizes the results of the revised analysis for the Design Point:

	25-Year cfs rate	100-Year cfs rate
Pre Development	9.80	16.87
Post Development	9.02	16.56
Post Development Mounding	9.32	16.71

The analysis shows only a slight increase in rate of discharge to the wetland, which remains below the pre-development peak rate. Additionally, the infiltration pond still remains with more than 1' of freeboard.

The other concern with the mound is the drain out time for the infiltration basin. The infiltration pond needs to drain out within 72 hours of the storm event. If there is no mound within the system, the infiltration pond drains out within 40 hours of the start of stormwater entering the basin. This means when the mound is within the system, there is approximately 32 hours for the mound to dissipate and the remainder of the stormwater to infiltrate. Note the system outlet is at 95.75 with the bottom of the basin at elevation 94.50. That means there is 1.25' of stormwater (about 4,067 cf) of stormwater that needs to infiltrate in 32 hours in a silty loam soil. It is not anticipated that stormwater will remain in the system for longer than 72 hours after the 100-year storm event.

In summary, the ground water mound will not have a detrimental effect to the functionality of the infiltration pond and there will not be an impact to the wetland due to the groundwater mound. See attached Mounding Calculation Sheets and HydroCAD.

Appendix C – Floodplain Study

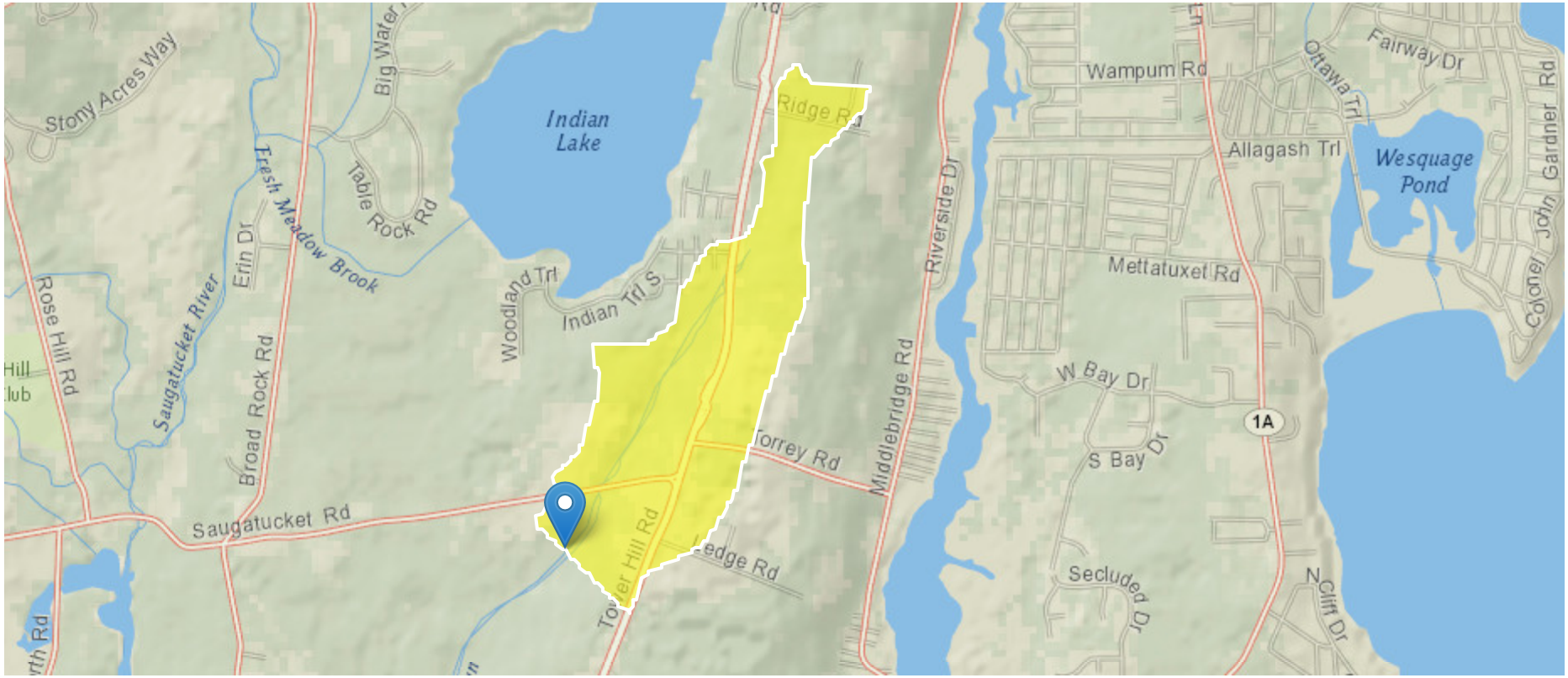
Although the project site is not within any FEMA 100-year floodplain, a floodplain analysis was conducted to assess if Indian Run Brook could flood into the project area during the 100-year storm event.

The study area is the section of Indian Run brook that runs through the southeast corner of the property. The drainage area, cover types, and Time of Concentration (Tc) were determined using StreamStats and modeled in HydroCAD. The acreage of woods, impervious, water, and wetlands was determined using the StreamStats report. The remaining area was assigned as grass. Upland areas were assigned HSG C according to Web Soil Survey. Water and wetland areas were assigned HSG D. A direct entry Tc was used in HydroCAD. The length of time was assigned so that the 100-year discharge rate of the subcatchment in HydroCAD matched the 100-year discharge rate reported in StreamStats. The section of Indian Run Brook that runs through the property was modeled as a reach in HydroCAD using existing topography in AutoCAD.

During the 100-year storm event, the section of Indian Run Brook within the site's property floods 1.16 feet. At the highest point of the stream within the property boundary, this floods to approximately elevation 88.16. As the A-Series wetland boundary roughly follows elevation 90, the floodplain of Indian Run Brook does not encroach into the defined project area.

StreamStats Report

Region ID: RI
Workspace ID: RI20250116145254174000
Clicked Point (Latitude, Longitude): 41.46352, -71.46943
NHD Stream GNIS Name of Click Point: Indian Run
HUC 8 of Clicked Point: 01090006 (Point Judith-Block Island)
Time: 2025-01-16 09:53:22 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit	
CAT1ROADS	Length of interstates lmtd access highways and ramps for lmtd access highways, includes cloverleaf interchanges (USGS Ntl Transp Dataset)	0	miles	
CAT2ROADS	Length of sec hwy or maj connecting roads; main arteries & hwys not lmtd access, usually in the US Hwy or State Hwy systems (USGS Ntl Transp Dataset)	2	miles	
CAT3ROADS	Length of local connecting roads; roads that collect traffic from local roads & connect towns, subdivisions & neighborhoods (USGS Nat Transp Dataset)	0	miles	
CAT4ROADS	Length of local roads; generally paved street, road, or byway that usually have single lane of traffic in each direction (USGS Ntnl Transp Dataset)	1.76	miles	
CROPS	Percent of area covered by agriculture	15.4	percent	
CROSCOUNT1	Number of intersections between streams and roads, where the roads are interstate, limited access highway, or ramp (CAT1ROADS)	0	dimensionless	
CROSCOUNT2	Number of intersections between streams and roads, where the roads are secondary highway or major connecting road (CAT2ROADS)	2	dimensionless	
CROSCOUNT3	Number of intersections between streams and roads, where roads are local conecting roads (CAT3ROADS)	0	dimensionless	
CROSCOUNT4	Number of intersections between streams and roads, where roads are local roads (CAT4ROADS)	1	dimensionless	
CRSDFT	Percentage of area of coarse-grained stratified drift	0	percent	
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	34.5	feet per mi	
DRNAREA	Area that drains to a point on a stream	0.43	square miles	275.2 acres
ELEV	Mean Basin Elevation	135	feet	
FOREST	Percentage of area covered by forest	24.9	percent	68.525 acres

Parameter Code	Parameter Description	Value	Unit	
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	29.5	percent	
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	10.3	percent	28.346 acres
LFPLENGTH	Length of longest flow path	1.79	miles	
STORNHD	Percent storage (wetlands and waterbodies) determined from 1:24K NHD	7.9	percent	
STRDEN	Stream Density -- total length of streams divided by drainage area	2.29	miles per square mile	
STRDENED	Stream Density -- total length of streams divided by drainage area, edited from NHD	2.29	miles per square mile	
STRMTOT	total length of all mapped streams (1:24,000-scale) in the basin	0.98	miles	
STRMTOTED	Total stream length in miles - edited NHD	0.98	miles	
WATER	Percent of area covered by open water (lakes, ponds, reservoirs)	0.27	percent	0.743 acres
WETLAND	Percentage of Wetlands	33.8	percent	93.018 acres

REMAINDER GRASS: 84.568 ac

Peak-Flow Statistics

Peak-Flow Statistics Parameters [Statewide peak 2012 5109]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.43	square miles	4	404
STORNHD	Percent Storage from NHD	7.9	percent	3.37	19
STRDEN	Stream Density	2.29	miles per square mile	1.25	3.53

Peak-Flow Statistics Disclaimers [Statewide peak 2012 5109]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Peak-Flow Statistics Flow Report [Statewide peak 2012 5109]

Statistic	Value	Unit
20-percent AEP flood	20.6	ft^3/s
10-percent AEP flood	26.8	ft^3/s
4-percent AEP flood	37.6	ft^3/s
2-percent AEP flood	46.5	ft^3/s
1-percent AEP flood	56.4	ft^3/s
0.5-percent AEP flood	66	ft^3/s
0.2-percent AEP flood	79.9	ft^3/s

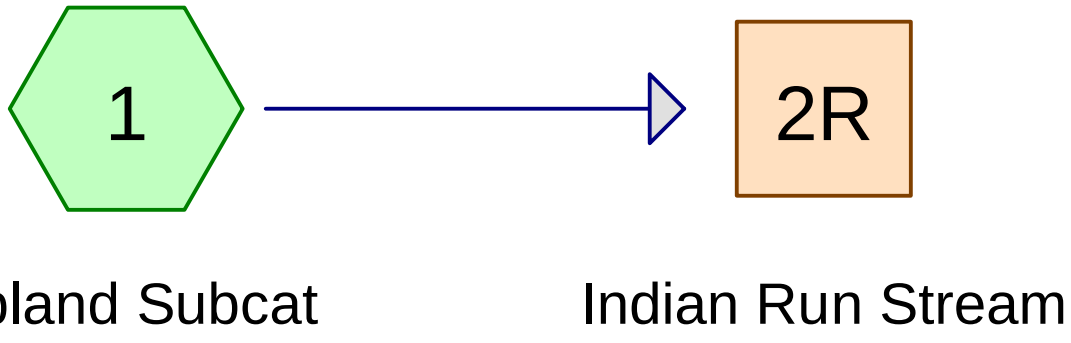
Peak-Flow Statistics Citations

Zarriello, P.J., Ahearn, E.A., and Levin, S.B.,2012, Magnitude of flood flows for selected annual exceedance probabilities in Rhode Island through 2010: U.S. Geological Survey Scientific Investigations Report 2012–5109, 93 p. (http://pubs.usgs.gov/sir/2012/5109)

Low-Flow Statistics

Low-Flow Statistics Parameters [Statewide Low Flow 2014 5010]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.43	square miles	0.52	294



Subcat Reach Pond Link

Routing Diagram for 3287-001-ALLS-HCAD-Stream Study
Prepared by DiPrete Engineering, Printed 1/23/2025

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
84.568	74	>75% Grass cover, Good, HSG C (1)
28.346	98	Impervious, HSG C (1)
0.743	98	Water Surface, 0% imp, HSG C (1)
68.525	70	Woods, Good, HSG C (1)
93.018	77	Woods, Good, HSG D (1)
275.200	**77**	**TOTAL AREA**

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 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

Subcatchment 1: Upland Subcat Runoff Area=275.200 ac 10.30% Impervious Runoff Depth>5.54"
Tc=1,801.0 min CN=77 Runoff=56.42 cfs 127.050 af

Reach 2R: Indian Run Stream Avg. Flow Depth=1.16' Max Vel=0.70 fps Inflow=56.42 cfs 127.050 af
n=0.100 L=177.1' S=0.0040 '/' Capacity=495.08 cfs Outflow=56.42 cfs 126.999 af

Total Runoff Area = 275.200 ac Runoff Volume = 127.050 af Average Runoff Depth = 5.54"
89.70% Pervious = 246.854 ac 10.30% Impervious = 28.346 ac

Summary for Subcatchment 1: Upland Subcat

Runoff = 56.42 cfs @ 36.02 hrs, Volume= 127.050 af, Depth> 5.54"
Routed to Reach 2R : Indian Run Stream

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.50"

Area (ac)	CN	Description
68.525	70	Woods, Good, HSG C
28.346	98	Impervious, HSG C
0.743	98	Water Surface, 0% imp, HSG C
93.018	77	Woods, Good, HSG D
84.568	74	>75% Grass cover, Good, HSG C
275.200	77	Weighted Average
246.854		89.70% Pervious Area
28.346		10.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1,801.0					**Direct Entry,**

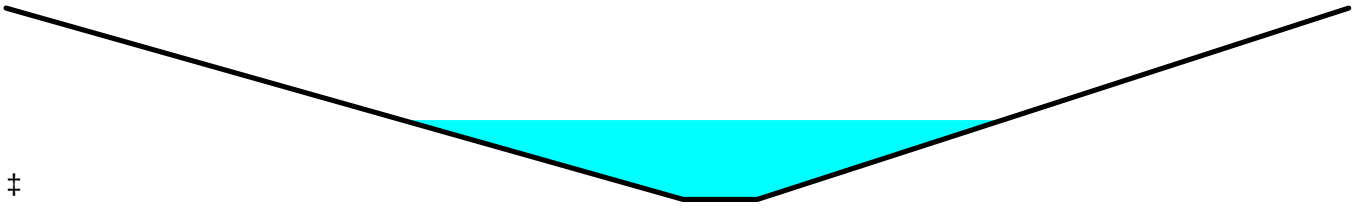
Summary for Reach 2R: Indian Run Stream

Inflow Area = 275.200 ac, 10.30% Impervious, Inflow Depth > 5.54" for 100-Year event
Inflow = 56.42 cfs @ 36.02 hrs, Volume= 127.050 af
Outflow = 56.42 cfs @ 36.03 hrs, Volume= 126.999 af, Atten= 0%, Lag= 1.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.70 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.50 fps, Avg. Travel Time= 5.9 min

Peak Storage= 14,235 cf @ 36.03 hrs
Average Depth at Peak Storage= 1.16' , Surface Width= 123.41'
Bank-Full Depth= 2.80' Flow Area= 408.6 sf, Capacity= 495.08 cfs

15.30' x 2.80' deep channel, n= 0.100
Side Slope Z-value= 49.8 43.5 '/' Top Width= 276.54'
Length= 177.1' Slope= 0.0040 '/'
Inlet Invert= 87.40', Outlet Invert= 86.70'



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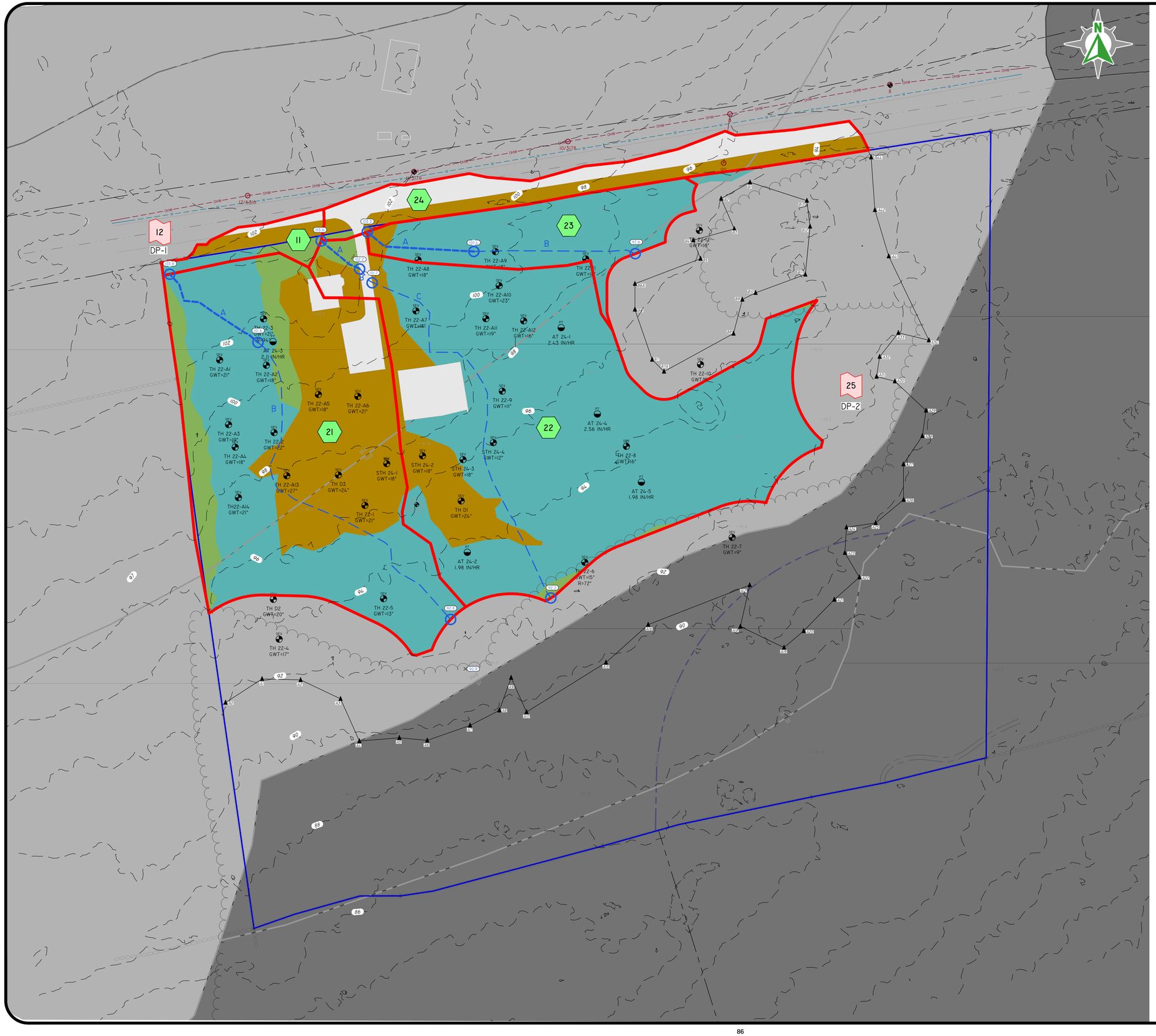

LEGEND

- WOODS - C SOILS
- GRASS - C SOILS
- IMPERVIOUS
- BRUSH - C SOILS

LEGEND

- TC LINE WITH ELEVATIONS
- SUBCATCHMENT AREA
- SOIL BOUNDARY
- REACH
- SUBCATCHMENT 10
- DESIGN POINT 10

SCALE: 1"=40'
0 20' 40' 80'

PRE-DEVELOPMENT WATERSHED MAP

SAUGATUCKET ACRES

DiPrete Engineering

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LEGEND

WOODS - C SOILS

IMPERVIOUS

GRASS - C SOILS

BRUSH - C SOILS

LEGEND

TC LINE WITH ELEVATIONS (93.5 A 92.4 B)

SUBCATCHMENT AREA

SOIL BOUNDARY

REACH

SUBCATCHMENT 100

DESIGN POINT 100

DRAINAGE POND 100

SCALE: 1"=40'

0 20' 40' 80'

POST-DEVELOPMENT WATERSHED MAP

SAUGATUCKET ACRES

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