STORMWATER SITE PLANNING, ANALYSIS AND DESIGN REPORT

FOR

VILLAGE AT BROAD ROCK

BROAD ROCK ROAD

SOUTH KINGSTOWN, RI

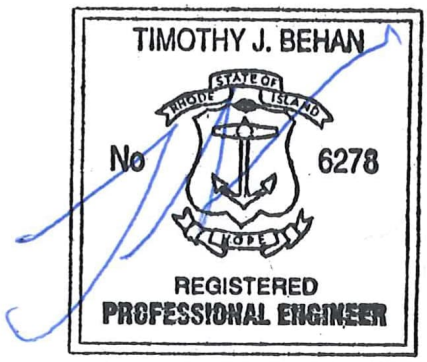
PREPARED FOR:

APPLICANT:

NEW ENGLAND PROPERTIES, LLC

257WICKFORD COURT

NORTH KINGSTOWN, RI 02852



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SEPTEMBER 2024

REVISED JANUARY 2025

CEC PROJECT NO. 23011.00

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INTRODUCTION

On behalf of New England Properties, LLC, Commonwealth Engineers & Consultants, Inc. (CEC) has prepared the following Rhode Island Department of Environmental Management (RIDEM) Stormwater Site Planning, Analysis and Design Report for the site development at 852 Broad Rock Road in South Kingstown, Rhode Island. This report has been prepared in accordance with the requirements of and guidance provided in the following:

- RIDEM Rules & Regulations for Governing the Administration and Enforcement of the Fresh Water Wetlands Act, issued 07/01/2022 (hereinafter referred to as the "FWW Regulations")
- Rhode Island Stormwater Design and Installation Standards Manual, issued March 2015 (hereinafter referred to as the "RISDISM"),
- RIPDES Construction General Permit, issued 09/26/2020,
- RISDISM Stormwater Management Checklist (hereinafter referred to as the "Checklist")

I-A - General Project Narrative

The following are a general description of the existing conditions on and near the subject parcel, and a detailed description of the proposed development within a portion of same.

General Description of Project: The applicant is proposing to develop A.P. 33 Lot 24 into a 19-lot Flexible Design Residential Project (FDRP). Subject property is 16.5± acres in size and is situated in the R-40 zoning district. The FDRP type development is different from a conventional subdivision in that the FDRP will provide smaller lots with open space land.

Existing Property: The property is currently developed with a residential dwelling and is called Sweet Fern Farm.

Abutting Properties: The abutting properties to the north and south are residential properties situated in the R-40 zoning district. The properties located across Broad Rock Road to the east are residential and situated in the R-80 zoning district. The Saugatucket River abuts the subject property to the west. Across the river is the transfer station property which is zoned GI.

Natural Resources in the Area: The Saugatucket River abuts the subject property to the west and has freshwater wetlands associated with it. Refer to the site plans for the wetland edge delineation performed by Avizinis Environmental Services, Inc. (AESI). A copy of AESI's report is included in Appendix 6.

RIDEM identifies the abutting Saugatucket River as being a warm water fishery and having a TMDL for fecal coliform. RIDEM also indicates impairments of 1) iron and 2) bentic macroinvertebrates bioassessment; therefore, is subject to RIDEM review of the stormwater water system to ensure the TMDLs and impairments are properly addressed.

The subject property is not situated in the Town's groundwater protection overlay district as indicated on the Town GIS. The subject property is not situated in a SK natural heritage area as indicated on the Town GIS but is situated in a natural heritage area (ID #188) as indicated on RIDEM's GIS.

Flood Zones: The subject property is predominately situated in Zone X 'Area of minimal flood hazard' as identified by the Federal Emergency Management Agency Flood Rate Insurance Map, #44009C0201J, effective April 3, 2020. A small, localized area around the Saugatucket River is identified as a special flood hazard area Zone A. Refer to the attached site plans for the location of Zone A. The Saugatucket River is situated in the Town's special flood hazard area overlay district.

Topography: The project site has mild slopes (6%) which generally slope in a westerly direction from the high point near Broad Rock Road (elevation 89±) to the low point (elevation 33±) located at the Saugatucket River. Refer to the plan set which shows topography.

Notable Site Features: Subject property is partially developed with a residential dwelling, detached garage, and impervious driveway. The majority of subject property west of the residential dwelling is forested, undeveloped land. Refer to existing conditions plan for details. Another notable feature is the Saugatucket River abuts the property to the west.

Drainage divides: The RIDEM GIS map web site indicates the project site is situated in the Saugatucket River watershed and is identified as HUC 12 – 010900050401 and HUC 8 - 01090005.

Soils: The USDA-NRCS Soil Survey map indicates the soil in the proposed development area is BmA-Bridgehampton with typical characteristics of water tables greater than 6' deep and bedrock greater than 5' deep. Soil evaluations were performed by Avizinis Environmental Services, Inc. and witnessed by the RIDEM. Ground water tables were then monitored during the wet season and re-affirmed at deeper depths and verified by the RIDEM under OWTS application #2332-0114. Soil logs, location map, soils map and verified groundwater tables are provided in the Appendix.

Wastewater Disposal System: The proposed development will be serviced with onsite wastewater treatment systems (OWTS).

Potable Water Source: The proposed development will be serviced with public water from the Veolia Water Rhode Island (VWRI) system.

Construction Phasing: No construction phasing is proposed.

I-B – Proposed Stormwater Collection and Treatment system

Stormwater System Design:

The stormwater collection and treatment systems were designed to meet the criteria set forth by RIDEM. The system features the following:

- The minimum standards for Groundwater Recharge, Water Quality Volume, Conveyance and Natural Channel Protection, Overbank Flood Protection, Construction Erosion and Sedimentation Control and Stormwater Management System Operation and Maintenance have been met as well as the additional standards listed in Chapter 3.

- The proposed design includes infiltration systems for each roof. The infiltration systems all have four (4) Cultec infiltration chambers in a bed of crushed stone. The roof gutter leaders will be directed to a PVC collection system. Each system is designed to infiltrate the water quality storm. Larger storms will overflow at the connection of the roof leaders and PVC pipe and flow over ground to the infiltration pond. Detailed elevations for the infiltration systems are provided on Sheet 11 of the construction plans. The proposed infiltration systems meet the required setbacks from steep slopes and basements.

- The impervious areas of the developed site will drain to the proposed grass swale, which will discharge through drainage pipes to the proposed infiltration pond. The grass swale will have crushed stone check dams to reduce the flow velocity during large storms. Grass swale details are included on Sheet 13 of the construction plans.

- The stormwater infiltration pond has been designed with a minimum of 3-feet separation from seasonal high groundwater (east side of pond) and a maximum of 7-feet (west side of pond). As required by the Town, a gravel trench emergency pond drain has been included in the design. Infiltration Pond details are included on Sheet 12 of the construction plans.

- The attached HydroCAD analysis reports (Appendix A) show that the proposed condition discharge rates and volumes are less than the existing condition discharge rates and volumes, see summary table below.

Pre-Post Stormwater Summary Table								
	1-Year Peak Rate	1-Year Volume	10-Year Peak Rate	10-Year Volume	25-Year Peak Rate	25-Year Volume	100-Year Peak Rate	100-Year Volume
	(CFS)	(ACRE-FEET)	(CFS)	(ACRE-FEET)	(CFS)	(ACRE-FEET)	(CFS)	(ACRE-FEET)
Pre-Development Conditions	1.25	0.341	11.17	1.688	18.93	2.751	38.28	5.151
Post-Development Conditions	1.17	0.251	8.20	1.009	13.55	1.620	26.01	3.663
Reduction	-0.07	-0.090	-3.04	-0.652	-5.38	-1.131	-12.41	-1.306

Conclusion

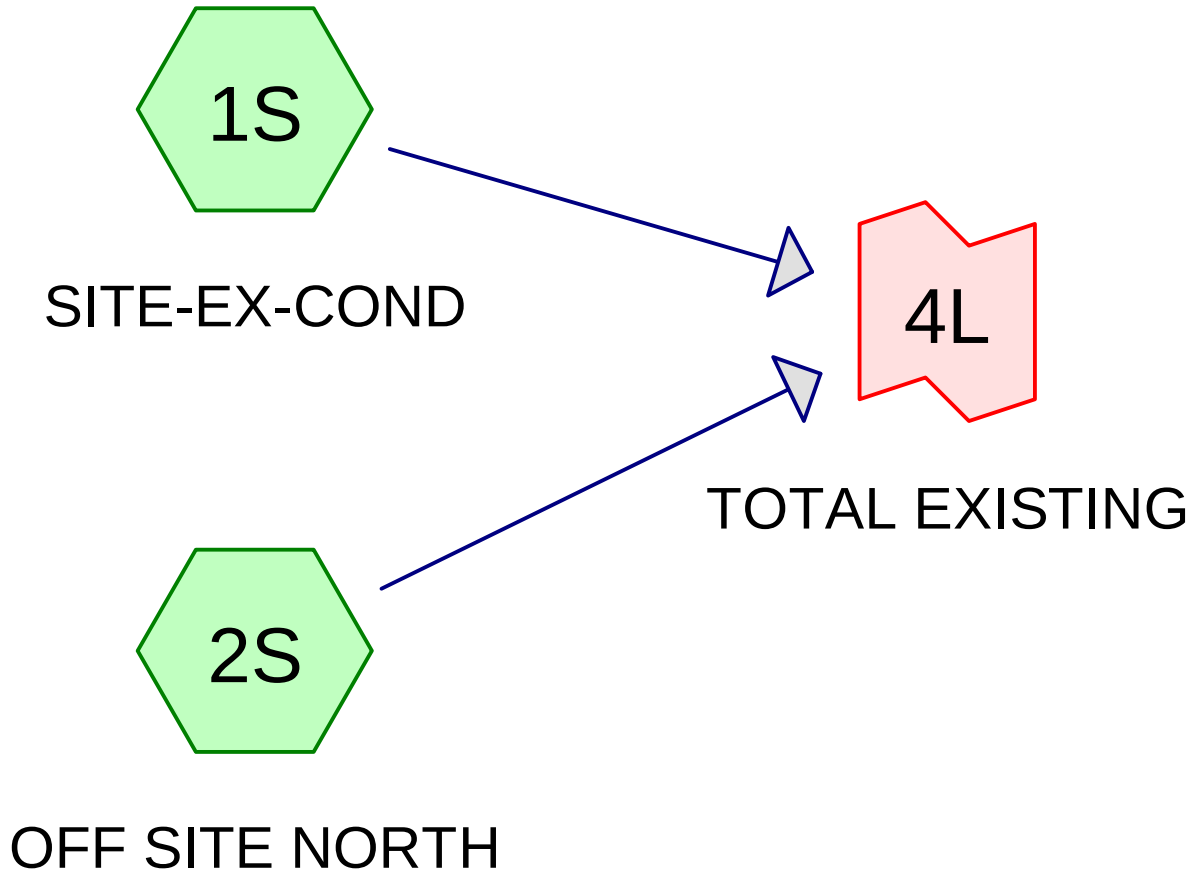
The stormwater collection and treatment systems meet the intent of the design criteria set forth by RIDEM. The system will protect the natural resources in the area by providing pollution protection and reduced peak flow rates and volumes.

APPENDIX-1

HYDROCAD PRINTOUTS

WATER QUALITY, 1, 10, AND 100-YEAR STORMS

EXISTING & PROPOSED CONDITIONS



Subcat Reach Pond Link

Routing Diagram for 23011.00 EX-BROAD ROCK ROAD-08-28-2024
Prepared by Commonwealth Engineers and Consultants Inc., Printed 9/4/2024

Summary for Subcatchment 1S: SITE-EX-COND

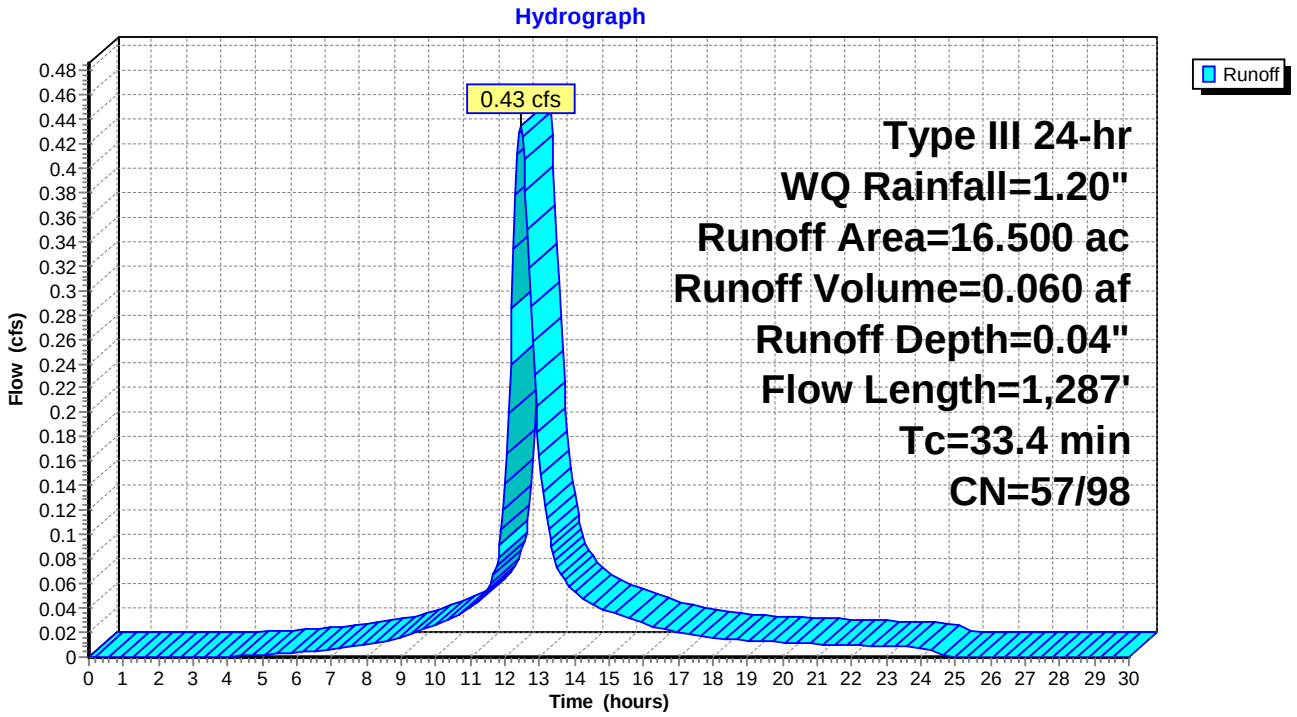
Runoff = 0.43 cfs @ 12.44 hrs, Volume= 0.060 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.080	98	Unconnected roofs, HSG B
0.270	98	Paved parking, HSG B
3.140	58	Woods/grass comb., Good, HSG B
11.510	55	Woods, Good, HSG B
0.380	98	Water Surface, HSG D
1.120	77	Woods, Good, HSG D
16.500	59	Weighted Average
15.770	57	95.58% Pervious Area
0.730	98	4.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.1	342	0.0320	2.68		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.0	400	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	445	0.0360	0.95		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.4	1,287	Total			

Subcatchment 1S: SITE-EX-COND



Summary for Subcatchment 2S: OFF SITE NORTH

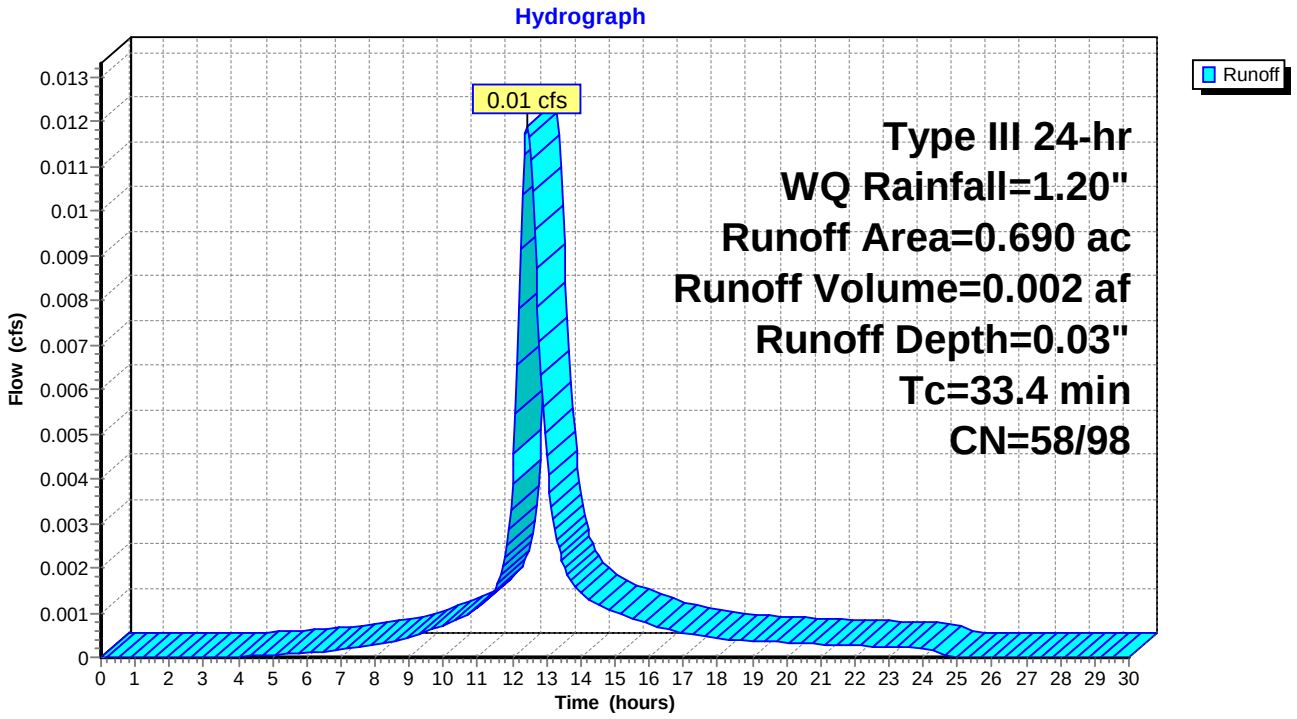
Runoff = 0.01 cfs @ 12.44 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.020	98	Paved parking, HSG B
0.670	58	Woods/grass comb., Good, HSG B
0.690	59	Weighted Average
0.670	58	97.10% Pervious Area
0.020	98	2.90% Impervious Area

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

Subcatchment 2S: OFF SITE NORTH

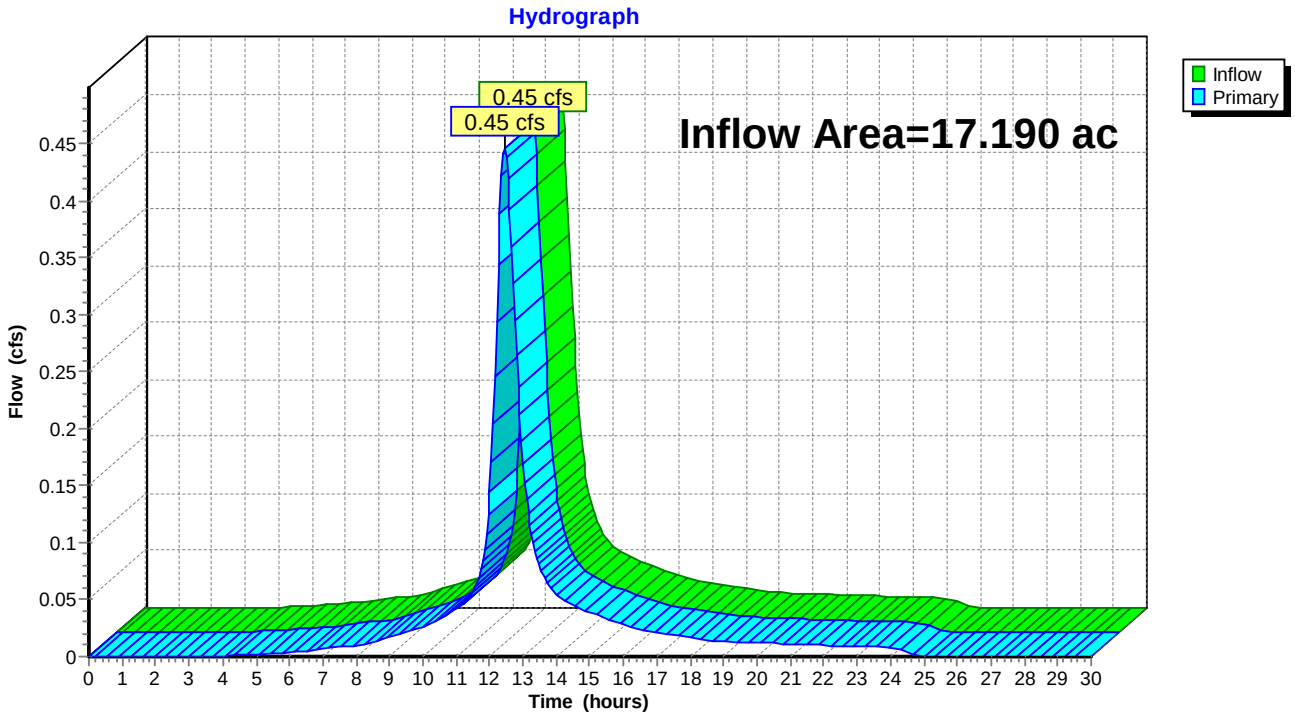


Summary for Link 4L: TOTAL EXISTING

Inflow Area = 17.190 ac, 4.36% Impervious, Inflow Depth = 0.04" for WQ event
Inflow = 0.45 cfs @ 12.44 hrs, Volume= 0.062 af
Primary = 0.45 cfs @ 12.44 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Link 4L: TOTAL EXISTING



Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SITE-EX-COND Runoff Area=16.500 ac 4.42% Impervious Runoff Depth=0.24"
Flow Length=1,287' Tc=33.4 min CN=59 Runoff=1.20 cfs 0.327 af

Subcatchment 2S: OFF SITE NORTH Runoff Area=0.690 ac 2.90% Impervious Runoff Depth=0.24"
Tc=33.4 min CN=59 Runoff=0.05 cfs 0.014 af

Link 4L: TOTAL EXISTING Inflow=1.25 cfs 0.341 af
Primary=1.25 cfs 0.341 af

Total Runoff Area = 17.190 ac Runoff Volume = 0.341 af Average Runoff Depth = 0.24"
95.64% Pervious = 16.440 ac 4.36% Impervious = 0.750 ac

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SITE-EX-COND Runoff Area=16.500 ac 4.42% Impervious Runoff Depth=1.18"
Flow Length=1,287' Tc=33.4 min CN=59 Runoff=10.72 cfs 1.620 af

Subcatchment 2S: OFF SITE NORTH Runoff Area=0.690 ac 2.90% Impervious Runoff Depth=1.18"
Tc=33.4 min CN=59 Runoff=0.45 cfs 0.068 af

Link 4L: TOTAL EXISTING Inflow=11.17 cfs 1.688 af
Primary=11.17 cfs 1.688 af

Total Runoff Area = 17.190 ac Runoff Volume = 1.688 af Average Runoff Depth = 1.18"
95.64% Pervious = 16.440 ac 4.36% Impervious = 0.750 ac

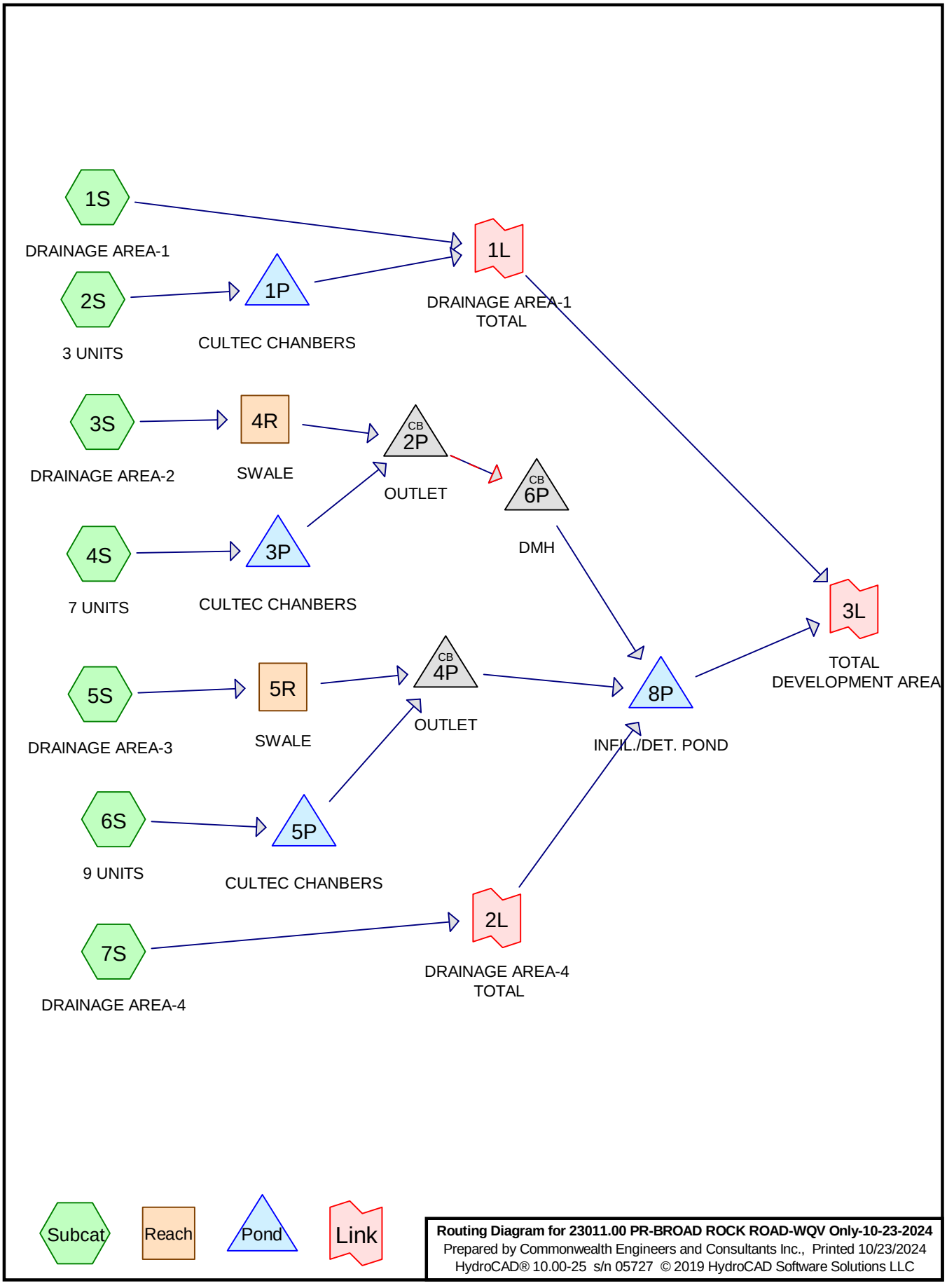
Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SITE-EX-COND Runoff Area=16.500 ac 4.42% Impervious Runoff Depth=3.60"
Flow Length=1,287' Tc=33.4 min CN=59 Runoff=36.74 cfs 4.944 af

Subcatchment 2S: OFF SITE NORTH Runoff Area=0.690 ac 2.90% Impervious Runoff Depth=3.60"
Tc=33.4 min CN=59 Runoff=1.54 cfs 0.207 af

Link 4L: TOTAL EXISTING Inflow=38.28 cfs 5.151 af
Primary=38.28 cfs 5.151 af

Total Runoff Area = 17.190 ac Runoff Volume = 5.151 af Average Runoff Depth = 3.60"
95.64% Pervious = 16.440 ac 4.36% Impervious = 0.750 ac



Routing Diagram for 23011.00 PR-BROAD ROCK ROAD-WQV Only-10-23-2024
Prepared by Commonwealth Engineers and Consultants Inc., Printed 10/23/2024
HydroCAD® 10.00-25 s/n 05727 © 2019 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: DRAINAGE AREA-1

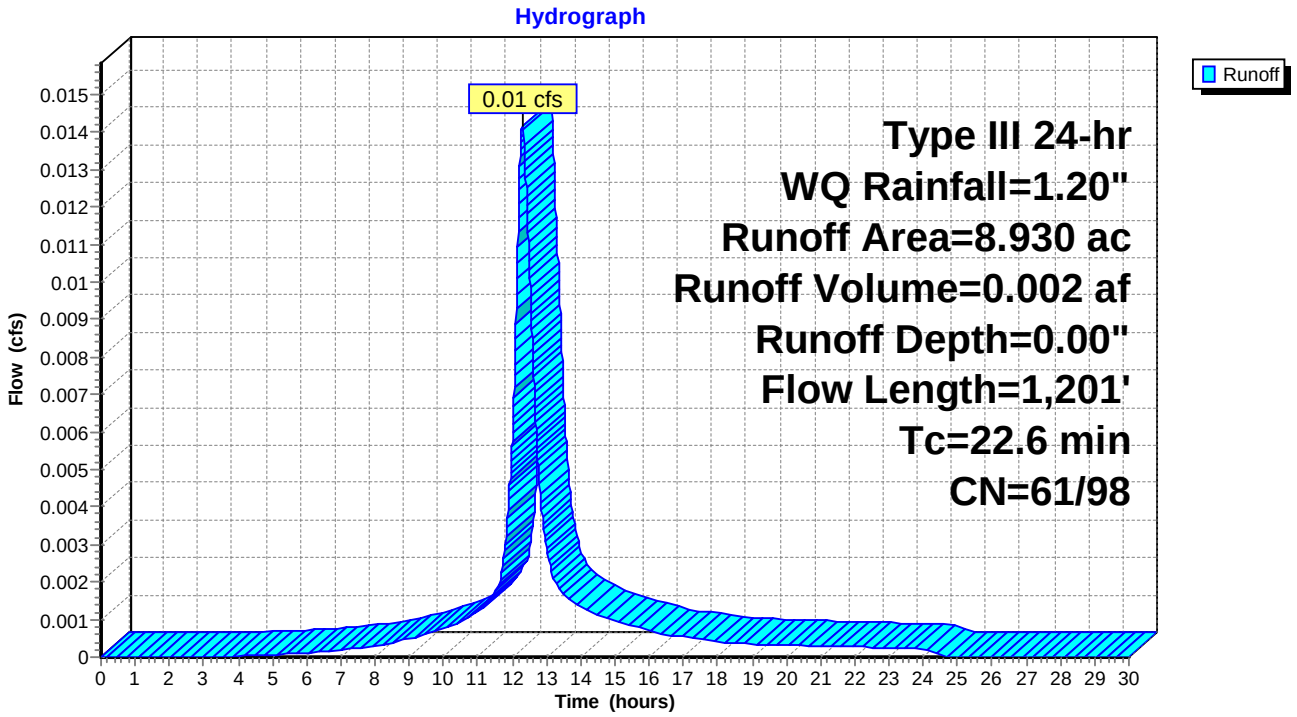
Runoff = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
1.610	61	>75% Grass cover, Good, HSG B
5.800	55	Woods, Good, HSG B
0.380	98	Water Surface, 0% imp, HSG D
1.120	77	Woods, Good, HSG D
0.020	98	Paved parking, HSG B
8.930	61	Weighted Average
8.910	61	99.78% Pervious Area
0.020	98	0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.8	483	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	327	0.0430	3.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.9	291	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.6	1,201	Total			

Subcatchment 1S: DRAINAGE AREA-1



Summary for Subcatchment 2S: 3 UNITS

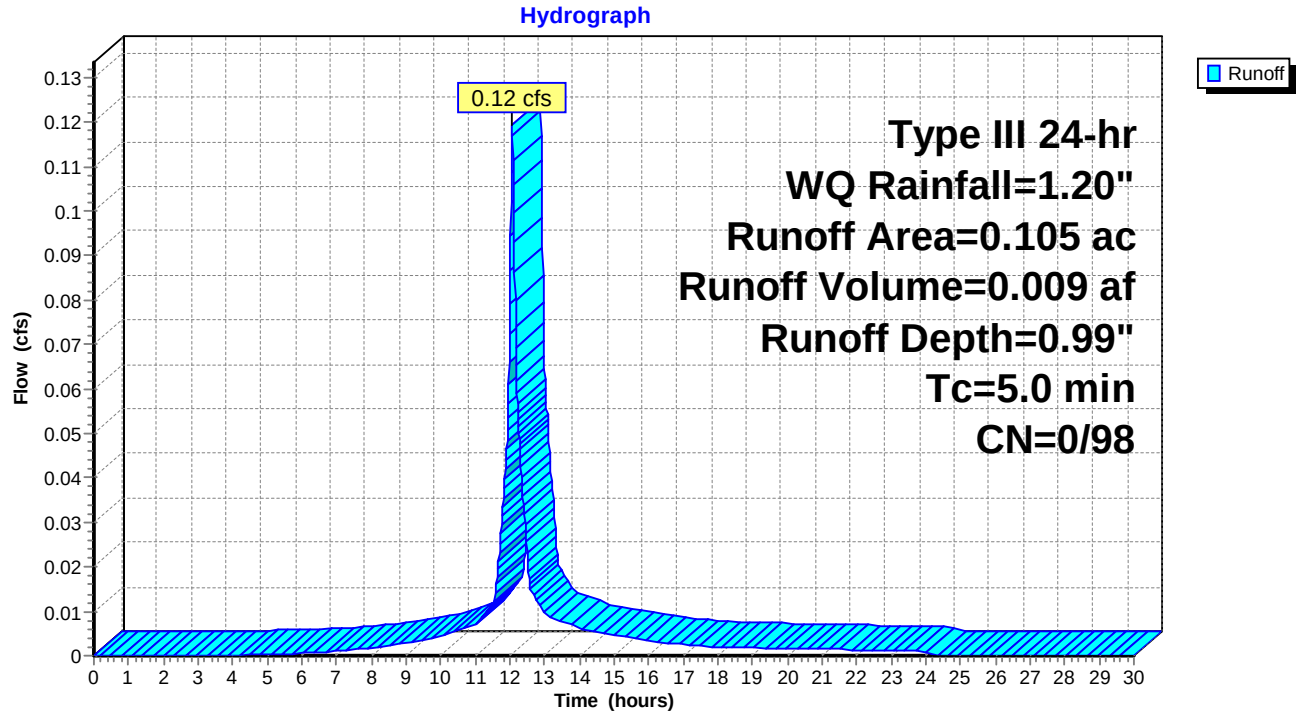
Runoff = 0.12 cfs @ 12.07 hrs, Volume= 0.009 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.105	98	Roofs, HSG B
0.105	98	100.00% Impervious Area

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

Subcatchment 2S: 3 UNITS



Summary for Subcatchment 3S: DRAINAGE AREA-2

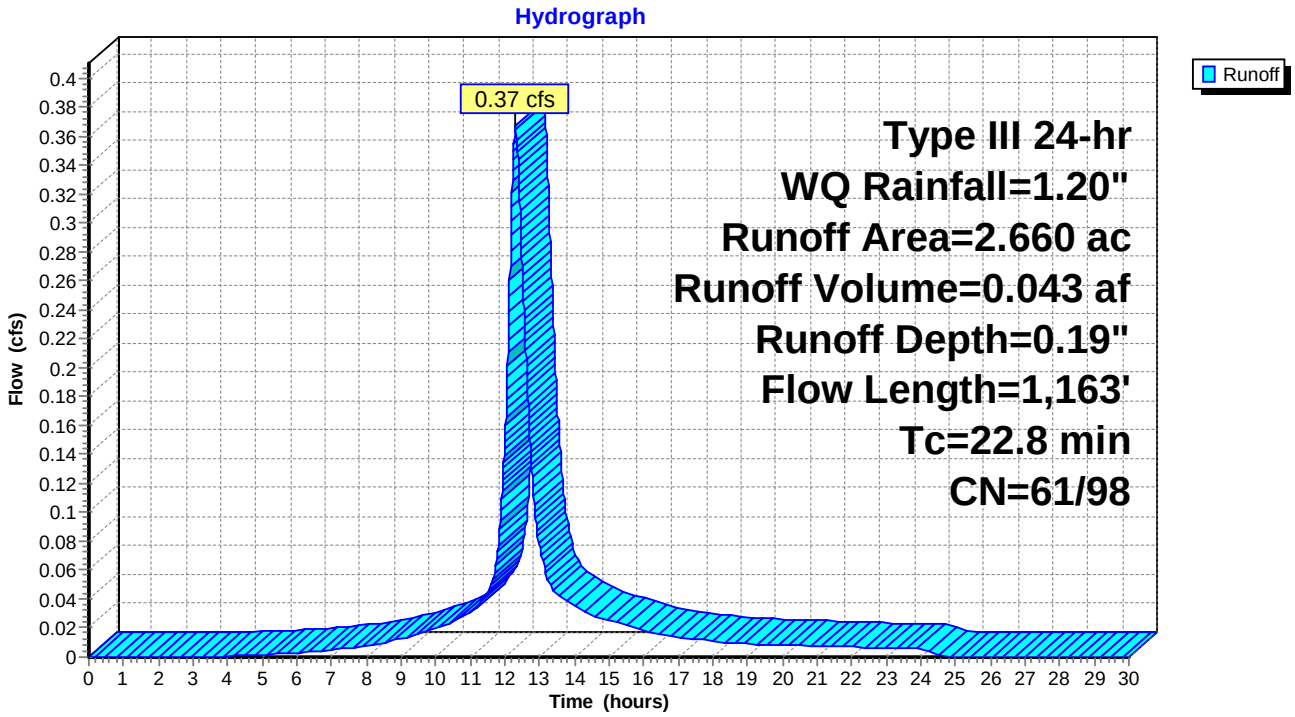
Runoff = 0.37 cfs @ 12.29 hrs, Volume= 0.043 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.350	58	Woods/grass comb., Good, HSG B
0.520	98	Paved parking, HSG B
1.790	61	>75% Grass cover, Good, HSG B
2.660	68	Weighted Average
2.140	61	80.45% Pervious Area
0.520	98	19.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.1	324	0.0300	2.60		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.4	281	0.0490	3.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	67	0.0450	13.73	411.75	**Channel Flow,** Area= 30.0 sf Perim= 32.0' r= 0.94' n= 0.022 Earth, clean & straight
0.1	118	0.0590	15.11	18.54	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.6	273	0.0580	7.68	245.62	**Channel Flow,** Area= 32.0 sf Perim= 62.0' r= 0.52' n= 0.030 Earth, grassed & winding
22.8	1,163	Total			

Subcatchment 3S: DRAINAGE AREA-2



Summary for Subcatchment 4S: 7 UNITS

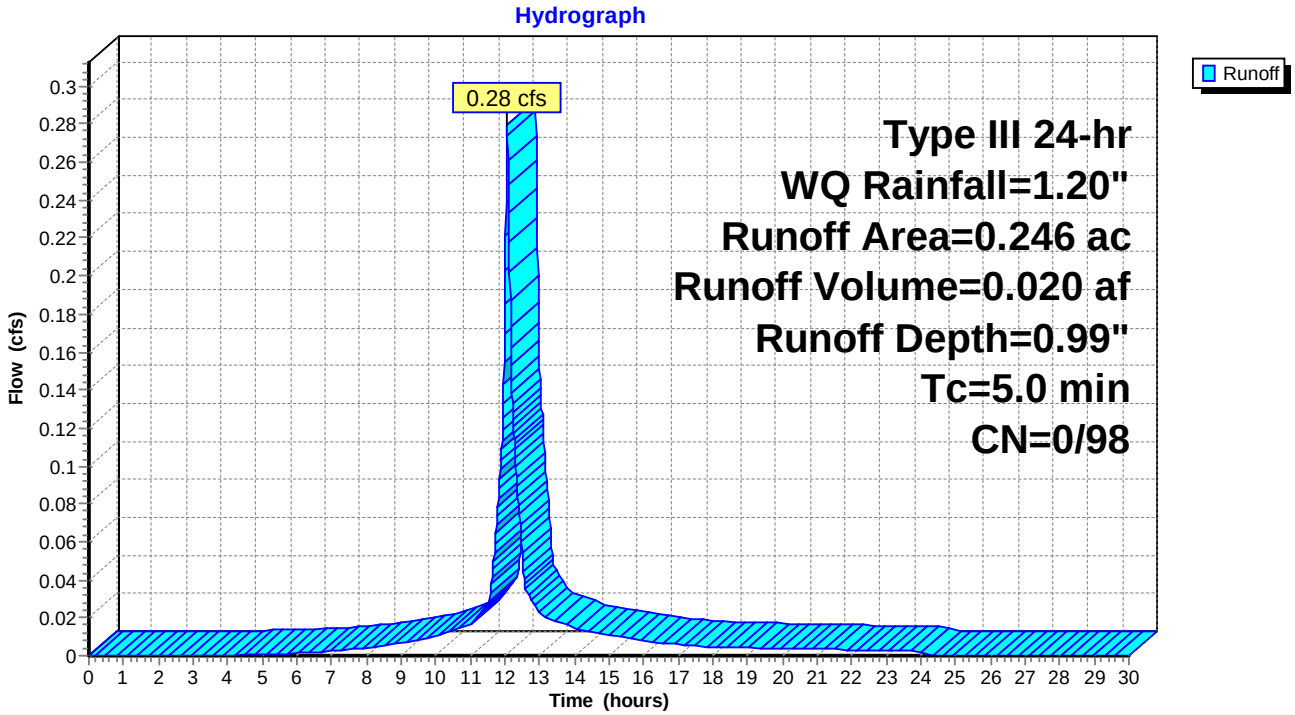
Runoff = 0.28 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.246	98	Roofs, HSG B
0.246	98	100.00% Impervious Area

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

Subcatchment 4S: 7 UNITS



Summary for Subcatchment 5S: DRAINAGE AREA-3

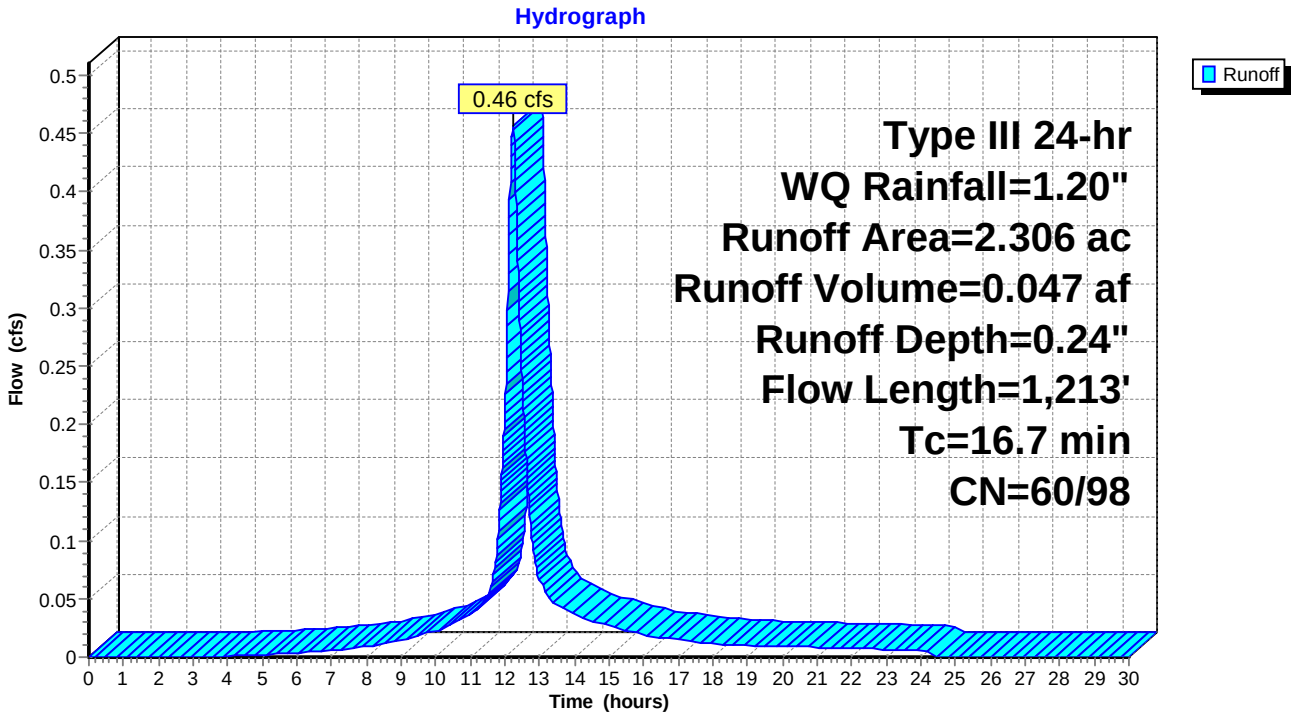
Runoff = 0.46 cfs @ 12.22 hrs, Volume= 0.047 af, Depth= 0.24"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.353	58	Woods/grass comb., Good, HSG B
0.569	98	Paved parking, HSG B
1.384	61	>75% Grass cover, Good, HSG B
2.306	70	Weighted Average
1.737	60	75.33% Pervious Area
0.569	98	24.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.2	57	0.0700	3.97		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.6	683	0.0400	7.18	84.00	**Channel Flow,** Area= 11.7 sf Perim= 30.2' r= 0.39' n= 0.022 Earth, clean & straight
0.2	100	0.0200	8.80	10.80	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.6	273	0.0580	7.68	245.62	**Channel Flow,** Area= 32.0 sf Perim= 62.0' r= 0.52' n= 0.030 Earth, grassed & winding
16.7	1,213	Total			

Subcatchment 5S: DRAINAGE AREA-3



Summary for Subcatchment 6S: 9 UNITS

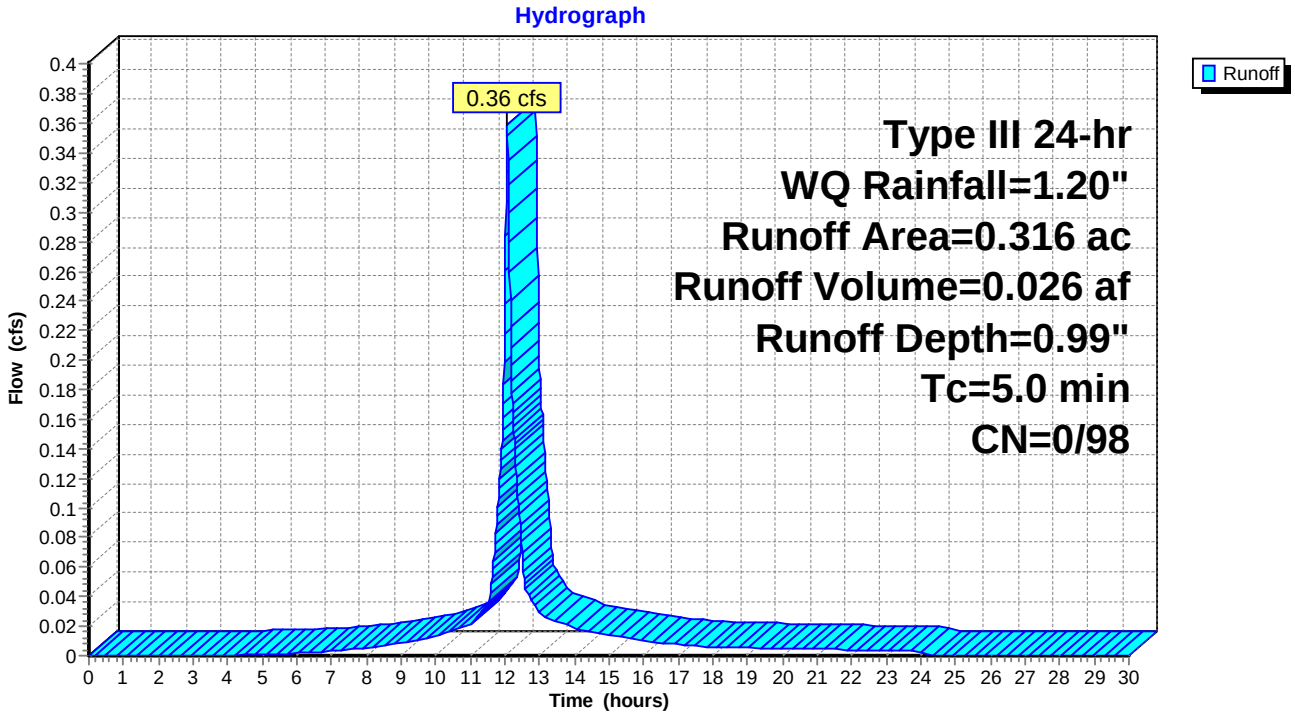
Runoff = 0.36 cfs @ 12.07 hrs, Volume= 0.026 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.316	98	Roofs, HSG B
0.316	98	100.00% Impervious Area

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

Subcatchment 6S: 9 UNITS



Summary for Subcatchment 7S: DRAINAGE AREA-4

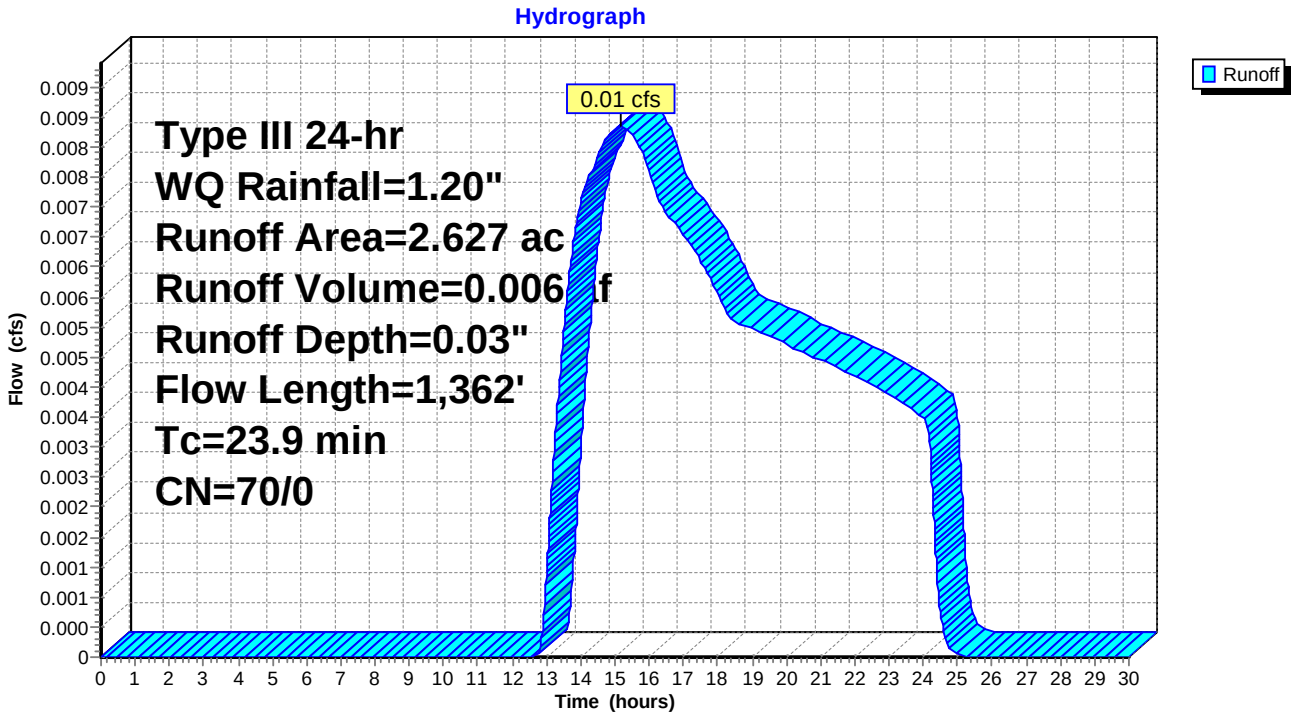
Runoff = 0.01 cfs @ 15.16 hrs, Volume= 0.006 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr WQ Rainfall=1.20"

Area (ac)	CN	Description
0.620	58	Woods/grass comb., Good, HSG B
0.670	98	Water Surface, 0% imp, HSG B
1.337	61	>75% Grass cover, Good, HSG B
2.627	70	Weighted Average
2.627	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
4.2	658	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	58	0.1700	6.18		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	273	0.0580	11.43	342.80	**Channel Flow,** Area= 30.0 sf Perim= 32.0' r= 0.94' n= 0.030 Earth, grassed & winding
0.6	273	0.0580	7.35	220.57	**Channel Flow,** Area= 30.0 sf Perim= 62.0' r= 0.48' n= 0.030 Earth, grassed & winding
23.9	1,362	Total			

Subcatchment 7S: DRAINAGE AREA-4



Summary for Reach 4R: SWALE

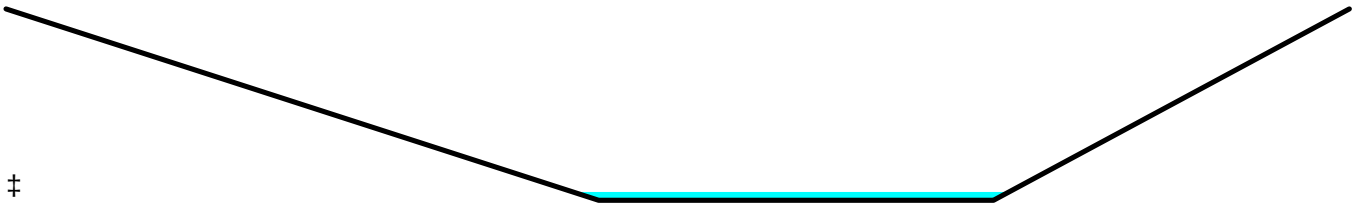
Inflow Area = 2.660 ac, 19.55% Impervious, Inflow Depth = 0.19" for WQ event
Inflow = 0.37 cfs @ 12.29 hrs, Volume= 0.043 af
Outflow = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af, Atten= 1%, Lag= 2.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Max. Velocity= 1.59 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 7.7 min

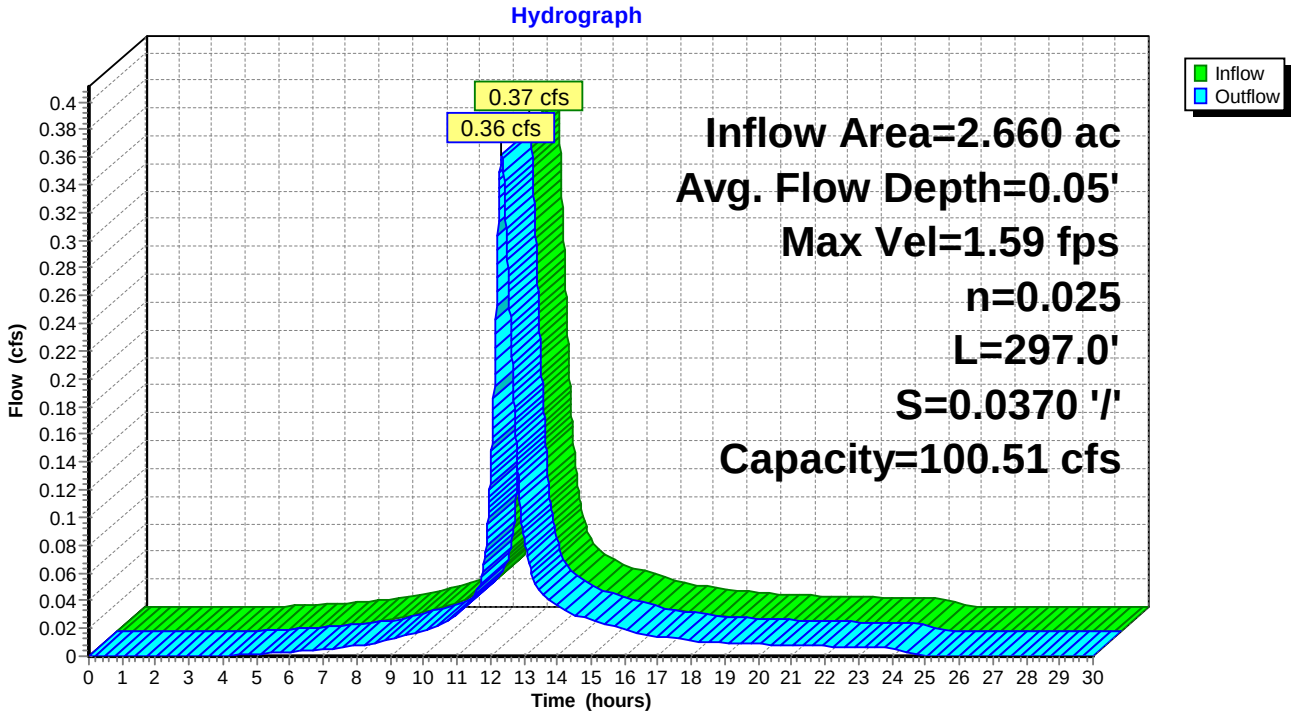
Peak Storage= 68 cf @ 12.34 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.20' Flow Area= 10.6 sf, Capacity= 100.51 cfs

4.00' x 1.20' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 5.0 3.0 '/' Top Width= 13.60'
Length= 297.0' Slope= 0.0370 '/'
Inlet Invert= 72.00', Outlet Invert= 61.00'

‡



Reach 4R: SWALE



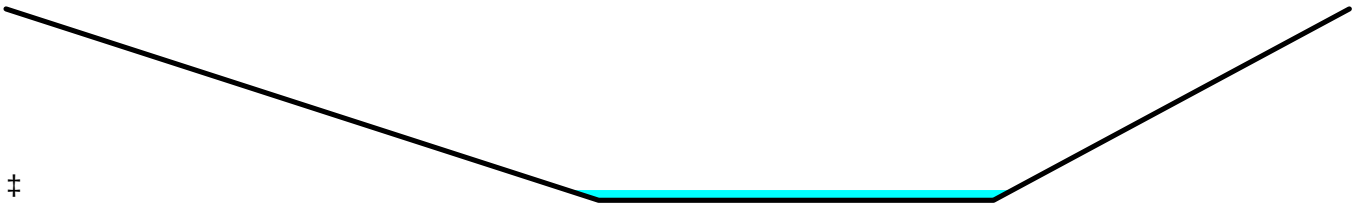
Summary for Reach 5R: SWALE

Inflow Area = 2.306 ac, 24.67% Impervious, Inflow Depth = 0.24" for WQ event
Inflow = 0.46 cfs @ 12.22 hrs, Volume= 0.047 af
Outflow = 0.43 cfs @ 12.28 hrs, Volume= 0.047 af, Atten= 6%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Max. Velocity= 1.59 fps, Min. Travel Time= 5.5 min
Avg. Velocity = 0.59 fps, Avg. Travel Time= 14.7 min

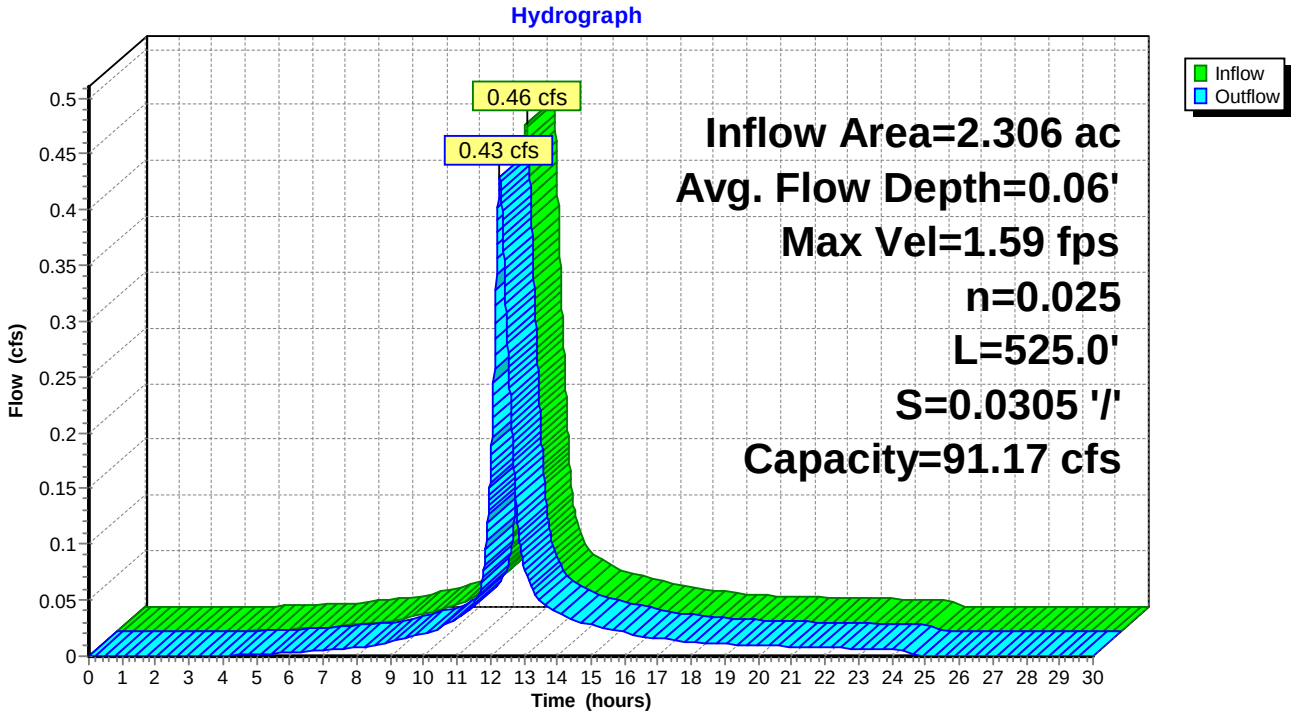
Peak Storage= 142 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.20' Flow Area= 10.6 sf, Capacity= 91.17 cfs

4.00' x 1.20' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 5.0 3.0 '/' Top Width= 13.60'
Length= 525.0' Slope= 0.0305 '/'
Inlet Invert= 80.00', Outlet Invert= 64.00'



‡

Reach 5R: SWALE



Summary for Pond 1P: CULTEC CHANBERS

Inflow Area = 0.105 ac,100.00% Impervious, Inflow Depth = 0.99" for WQ event
Inflow = 0.12 cfs @ 12.07 hrs, Volume= 0.009 af
Outflow = 0.01 cfs @ 11.61 hrs, Volume= 0.009 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.01 cfs @ 11.61 hrs, Volume= 0.009 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 80.72' @ 12.95 hrs Surf.Area= 0.010 ac Storage= 0.003 af

Plug-Flow detention time= 99.9 min calculated for 0.009 af (100% of inflow)
Center-of-Mass det. time= 99.9 min (881.0 - 781.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	0.002 af	**8.33'W x 17.50'L x 2.04'H Field A** 0.007 af Overall - 0.001 af Embedded = 0.006 af x 33.0% Voids
#2A	80.50'	0.001 af	**Cultec C-100HD** x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		0.003 af	x 3.00 = 0.009 af Total Available Storage

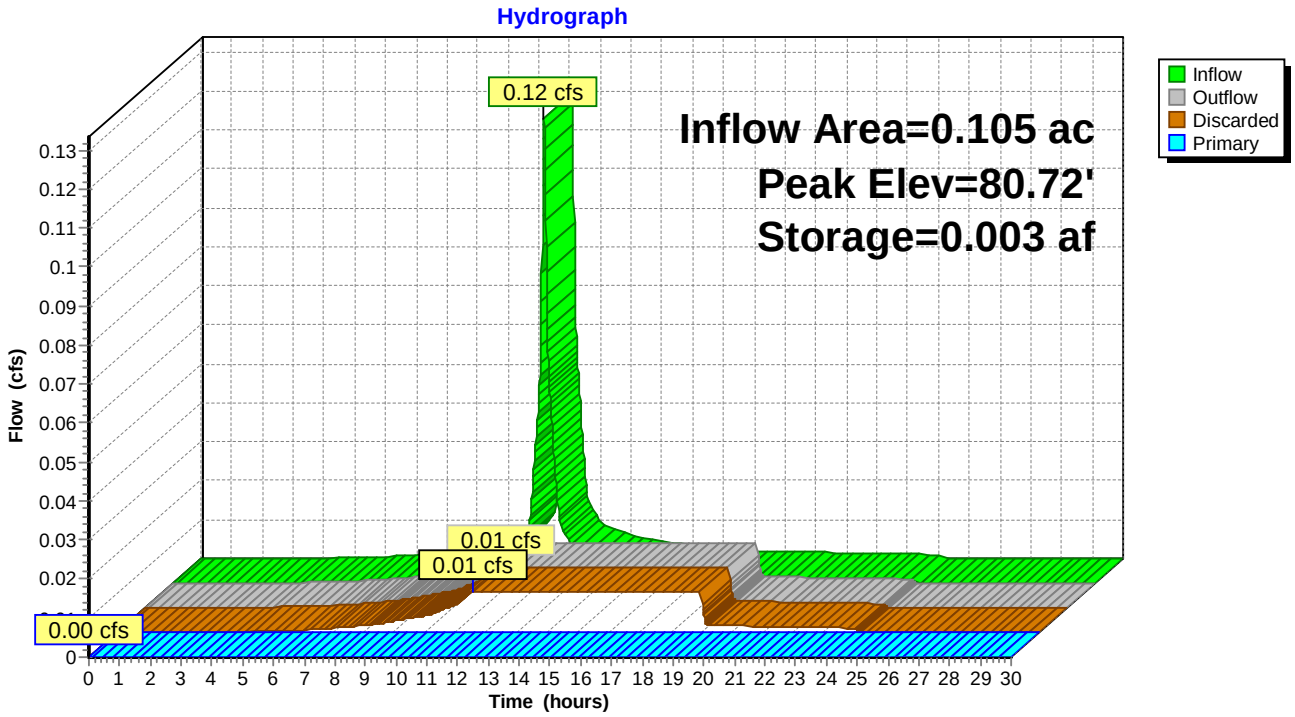
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	80.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	81.85'	**12.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 11.61 hrs HW=80.02' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: CULTEC CHANBERS



Summary for Pond 2P: OUTLET

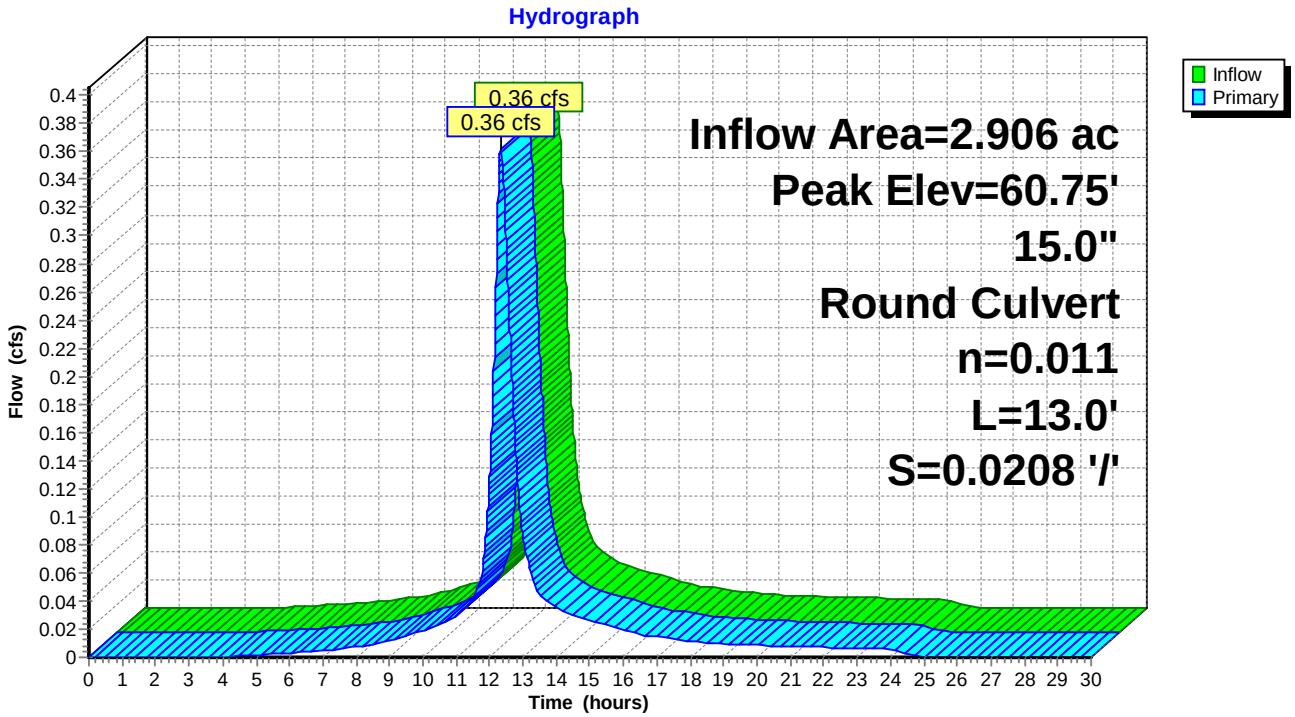
Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 0.18" for WQ event
Inflow = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af
Outflow = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 60.75' @ 12.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	60.47'	**15.0" Round Culvert** L= 13.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 60.47' / 60.20' S= 0.0208 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.36 cfs @ 12.34 hrs HW=60.75' TW=60.36' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.36 cfs @ 1.79 fps)

Pond 2P: OUTLET



Summary for Pond 3P: CULTEC CHANBERS

Inflow Area = 0.246 ac,100.00% Impervious, Inflow Depth = 0.99" for WQ event
Inflow = 0.28 cfs @ 12.07 hrs, Volume= 0.020 af
Outflow = 0.02 cfs @ 11.45 hrs, Volume= 0.020 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.02 cfs @ 11.45 hrs, Volume= 0.020 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 80.73' @ 12.96 hrs Surf.Area= 0.023 ac Storage= 0.008 af

Plug-Flow detention time= 102.8 min calculated for 0.020 af (100% of inflow)
Center-of-Mass det. time= 102.8 min (883.9 - 781.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	0.002 af	**8.33'W x 17.50'L x 2.04'H Field A** 0.007 af Overall - 0.001 af Embedded = 0.006 af x 33.0% Voids
#2A	80.50'	0.001 af	**Cultec C-100HD** x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		0.003 af	x 7.00 = 0.022 af Total Available Storage

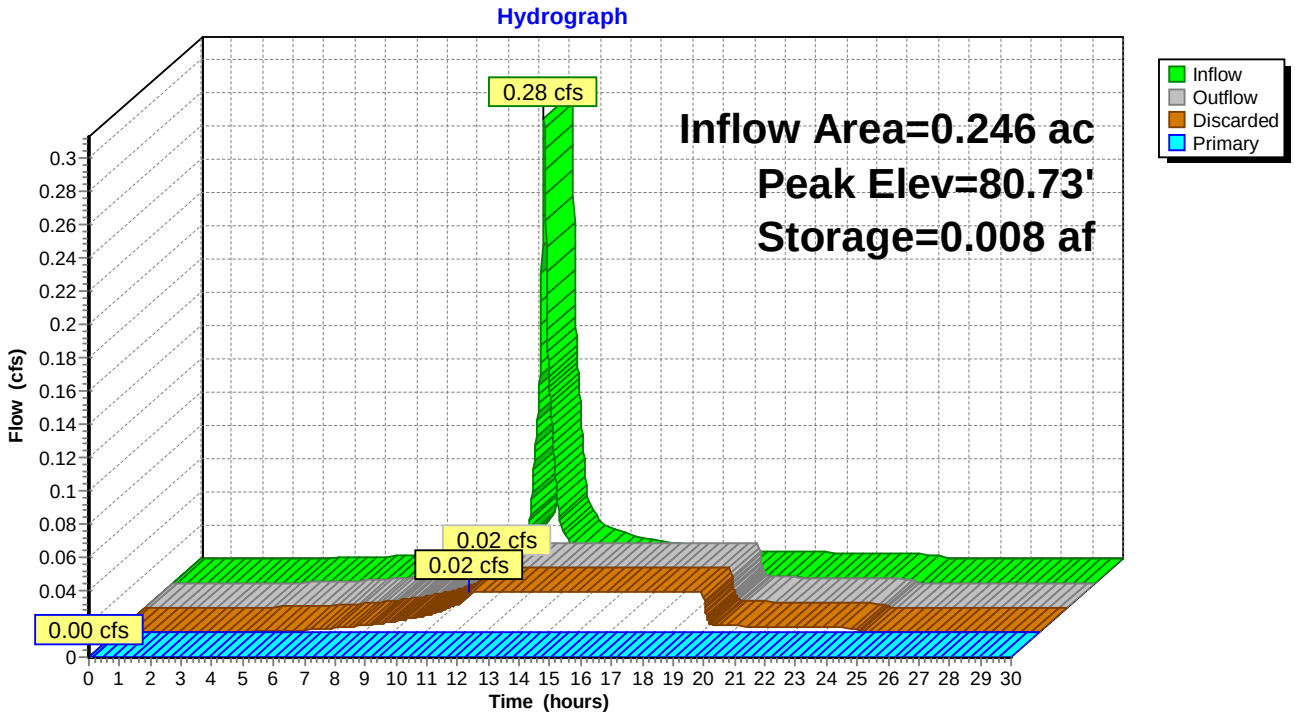
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	80.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.02'
#2	Primary	81.85'	**12.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.02 cfs @ 11.45 hrs HW=80.02' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=60.47' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: CULTEC CHANBERS



Summary for Pond 4P: OUTLET

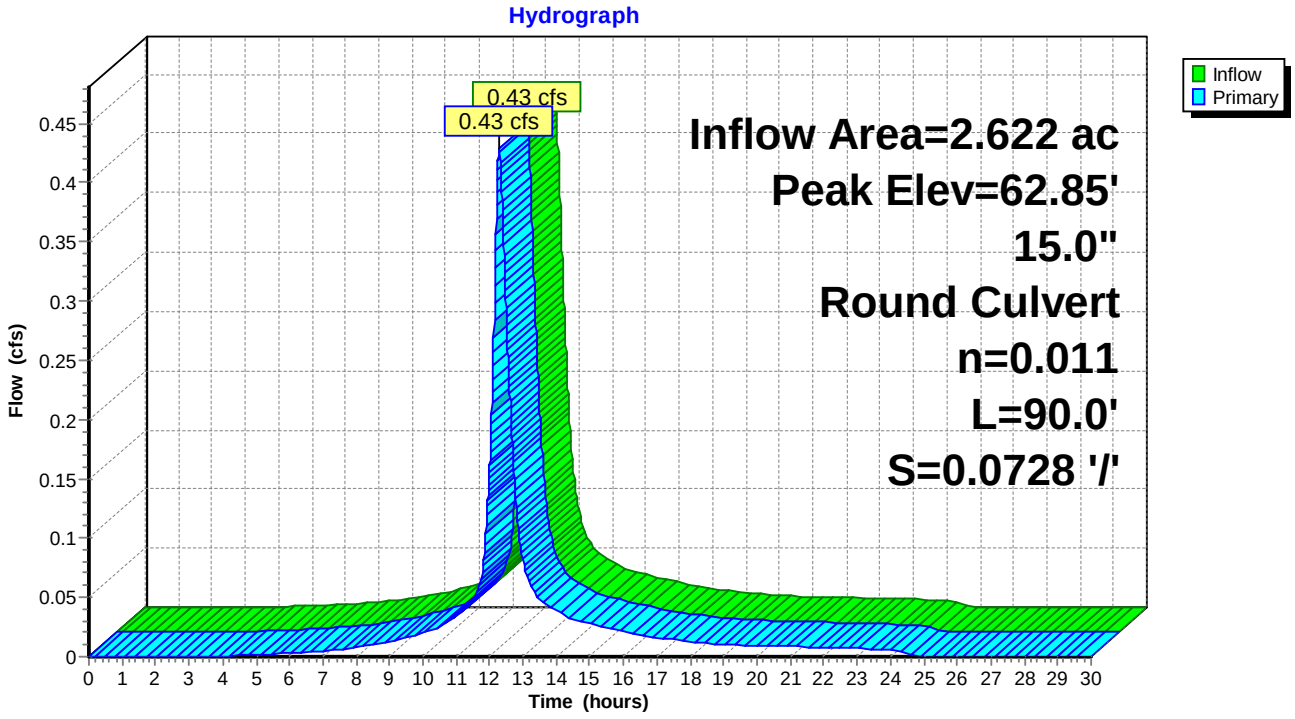
Inflow Area = 2.622 ac, 33.75% Impervious, Inflow Depth = 0.21" for WQ event
Inflow = 0.43 cfs @ 12.28 hrs, Volume= 0.047 af
Outflow = 0.43 cfs @ 12.28 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.28 hrs, Volume= 0.047 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 62.85' @ 12.28 hrs
Flood Elev= 64.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**15.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 62.55' / 56.00' S= 0.0728 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=0.43 cfs @ 12.28 hrs HW=62.85' TW=55.03' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.43 cfs @ 1.87 fps)

Pond 4P: OUTLET



Summary for Pond 5P: CULTEC CHANBERS

Inflow Area = 0.316 ac,100.00% Impervious, Inflow Depth = 0.99" for WQ event
Inflow = 0.36 cfs @ 12.07 hrs, Volume= 0.026 af
Outflow = 0.03 cfs @ 11.61 hrs, Volume= 0.026 af, Atten= 91%, Lag= 0.0 min
Discarded = 0.03 cfs @ 11.61 hrs, Volume= 0.026 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 80.72' @ 12.96 hrs Surf.Area= 0.030 ac Storage= 0.010 af

Plug-Flow detention time= 100.4 min calculated for 0.026 af (100% of inflow)
Center-of-Mass det. time= 100.4 min (881.5 - 781.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	0.002 af	**8.33'W x 17.50'L x 2.04'H Field A** 0.007 af Overall - 0.001 af Embedded = 0.006 af x 33.0% Voids
#2A	80.50'	0.001 af	**Cultec C-100HD** x 4 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		0.003 af	x 9.00 = 0.028 af Total Available Storage

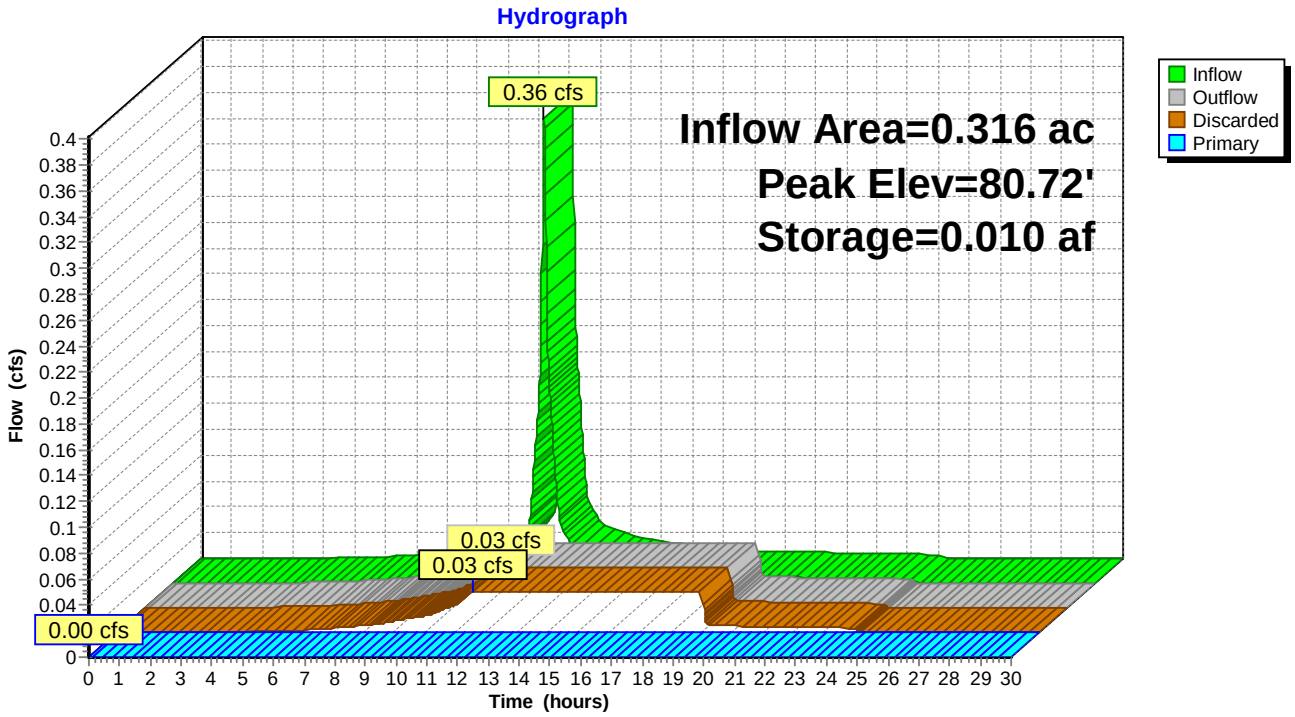
Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	80.00'	**1.020 in/hr Exfiltration over Surface area** Phase-In= 0.01'
#2	Primary	81.85'	**12.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.03 cfs @ 11.61 hrs HW=80.02' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=62.55' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: CULTEC CHANBERS



Summary for Pond 6P: DMH

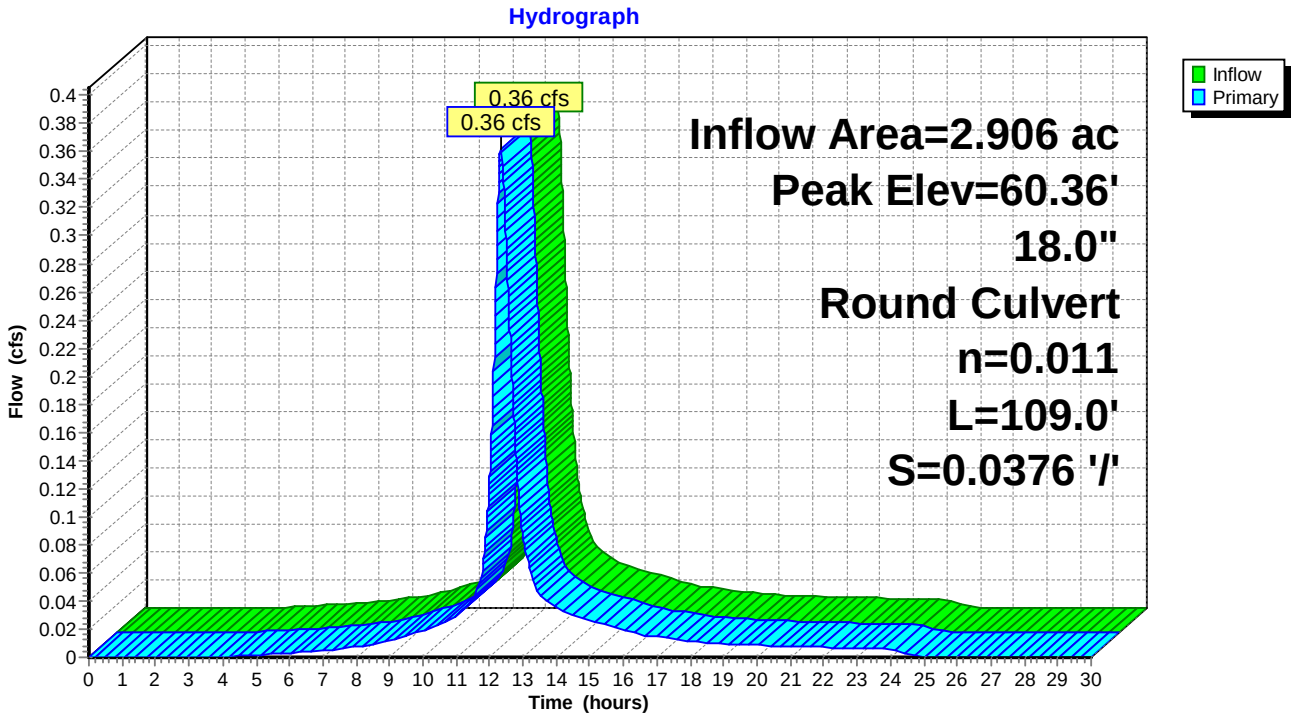
Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 0.18" for WQ event
Inflow = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af
Outflow = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Primary = 0.36 cfs @ 12.34 hrs, Volume= 0.043 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 60.36' @ 12.34 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	60.10'	**18.0" Round Culvert** L= 109.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 60.10' / 56.00' S= 0.0376 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=0.36 cfs @ 12.34 hrs HW=60.36' TW=55.04' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.36 cfs @ 1.74 fps)

Pond 6P: DMH



Summary for Pond 8P: INFIL./DET. POND

Inflow Area = 8.155 ac, 20.25% Impervious, Inflow Depth = 0.14" for WQ event
Inflow = 0.78 cfs @ 12.30 hrs, Volume= 0.095 af
Outflow = 0.24 cfs @ 12.83 hrs, Volume= 0.095 af, Atten= 70%, Lag= 32.1 min
Discarded = 0.24 cfs @ 12.83 hrs, Volume= 0.095 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 55.09' @ 12.83 hrs Surf.Area= 10,098 sf Storage= 876 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 19.7 min (839.4 - 819.7)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	121,242 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

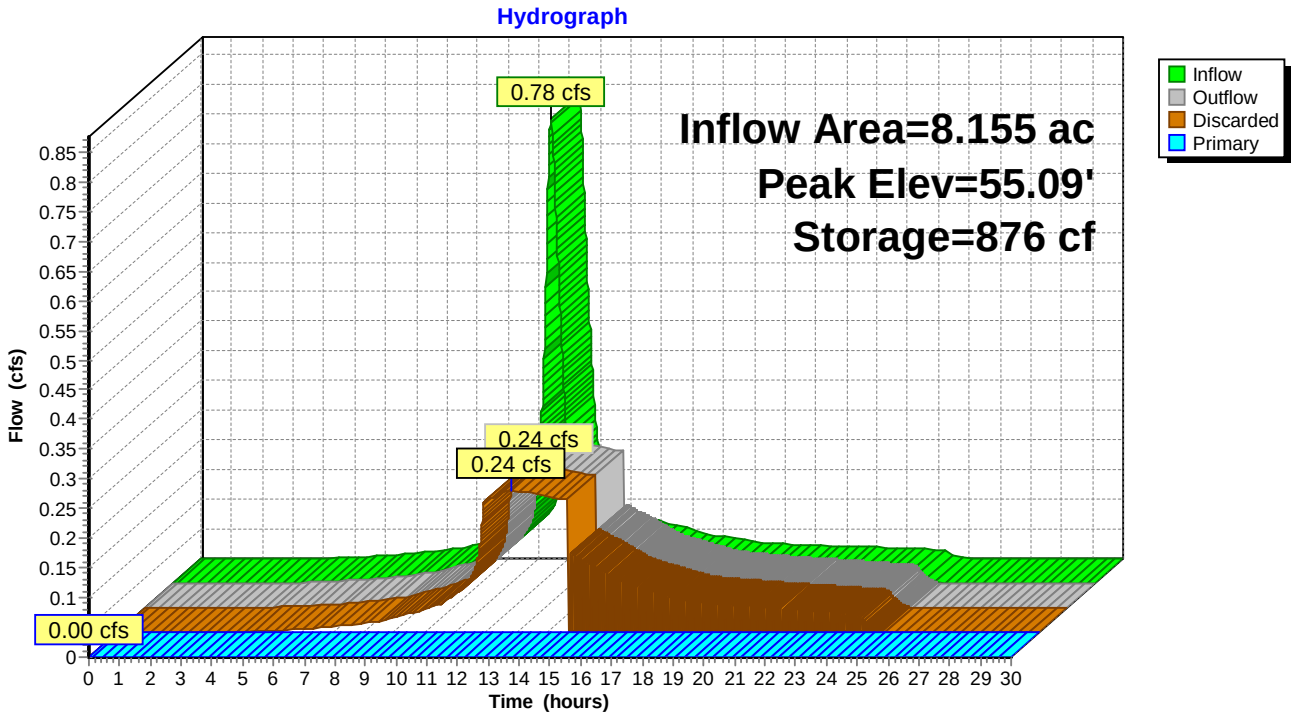
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	9,400	0	0
56.00	17,167	13,284	13,284
58.00	22,907	40,074	53,358
60.00	29,297	52,204	105,562
60.50	33,423	15,680	121,242

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	59.00'	**24.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.24 cfs @ 12.83 hrs HW=55.09' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.00' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: INFIL./DET. POND

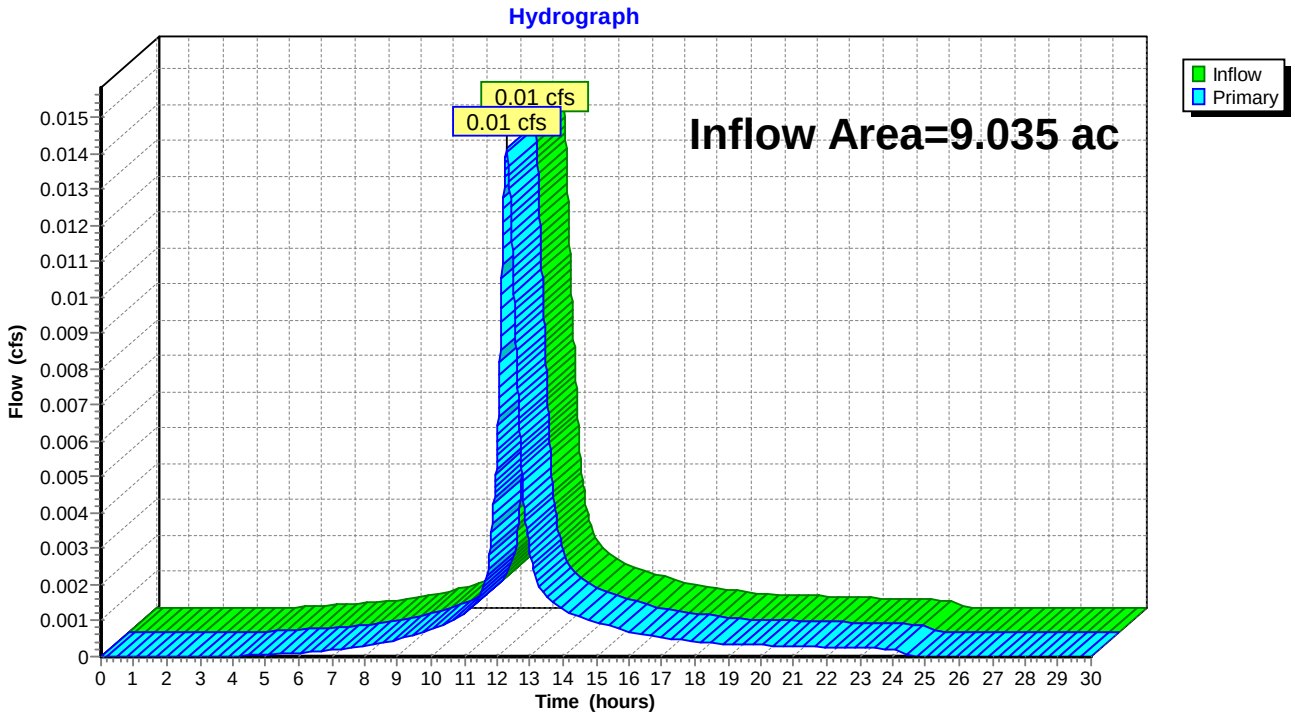


Summary for Link 1L: DRAINAGE AREA-1 TOTAL

Inflow Area = 9.035 ac, 1.38% Impervious, Inflow Depth = 0.00" for WQ event
Inflow = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af
Primary = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 1L: DRAINAGE AREA-1 TOTAL

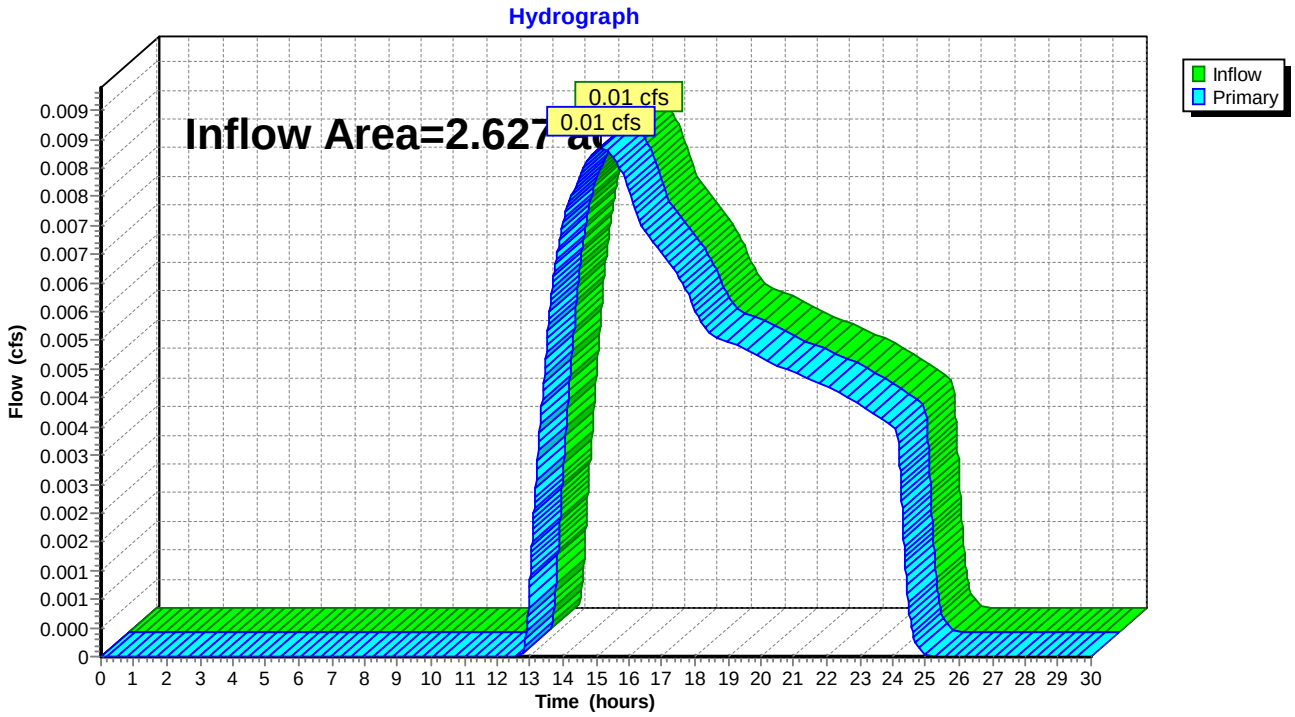


Summary for Link 2L: DRAINAGE AREA-4 TOTAL

Inflow Area = 2.627 ac, 0.00% Impervious, Inflow Depth = 0.03" for WQ event
Inflow = 0.01 cfs @ 15.16 hrs, Volume= 0.006 af
Primary = 0.01 cfs @ 15.16 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 2L: DRAINAGE AREA-4 TOTAL

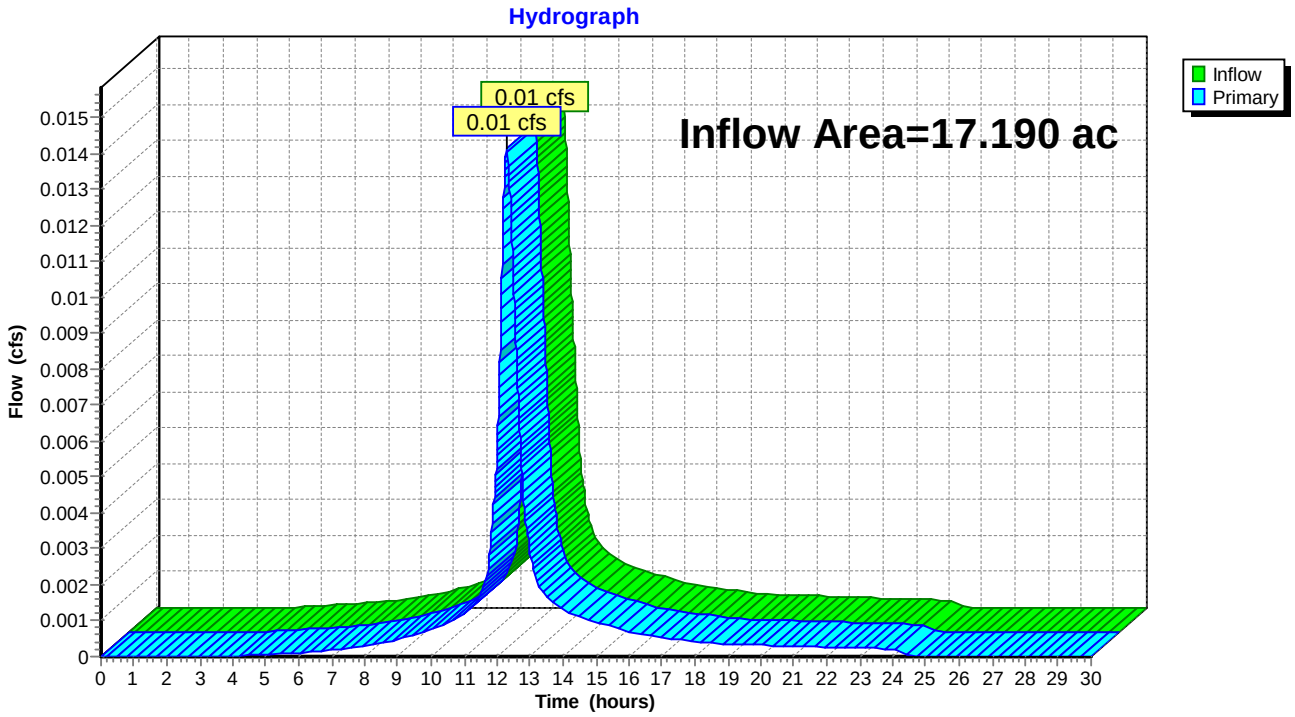


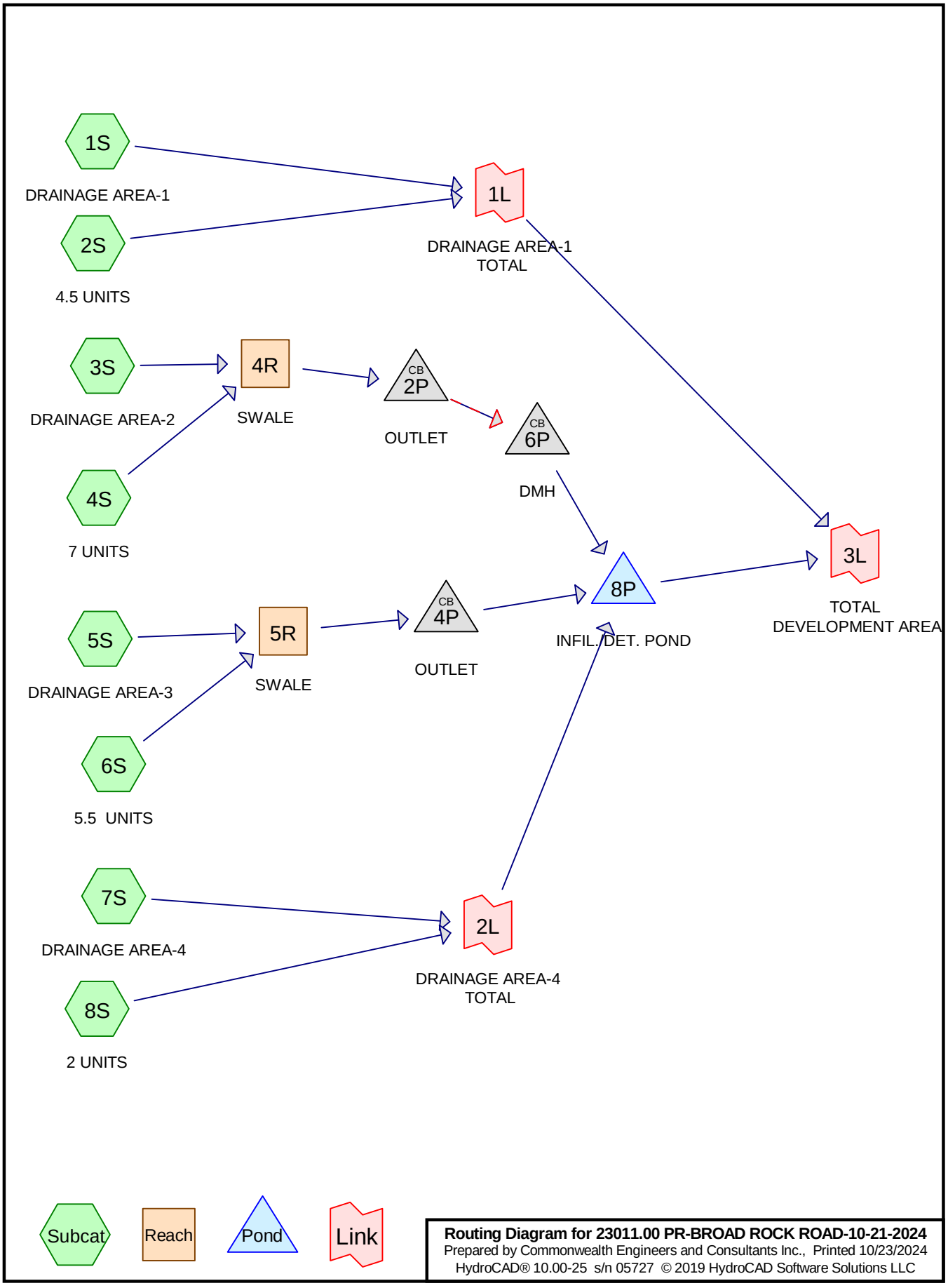
Summary for Link 3L: TOTAL DEVELOPMENT AREA

Inflow Area = 17.190 ac, 10.33% Impervious, Inflow Depth = 0.00" for WQ event
Inflow = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af
Primary = 0.01 cfs @ 12.30 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 3L: TOTAL DEVELOPMENT AREA





Routing Diagram for 23011.00 PR-BROAD ROCK ROAD-10-21-2024
Prepared by Commonwealth Engineers and Consultants Inc., Printed 10/23/2024
HydroCAD® 10.00-25 s/n 05727 © 2019 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: DRAINAGE AREA-1

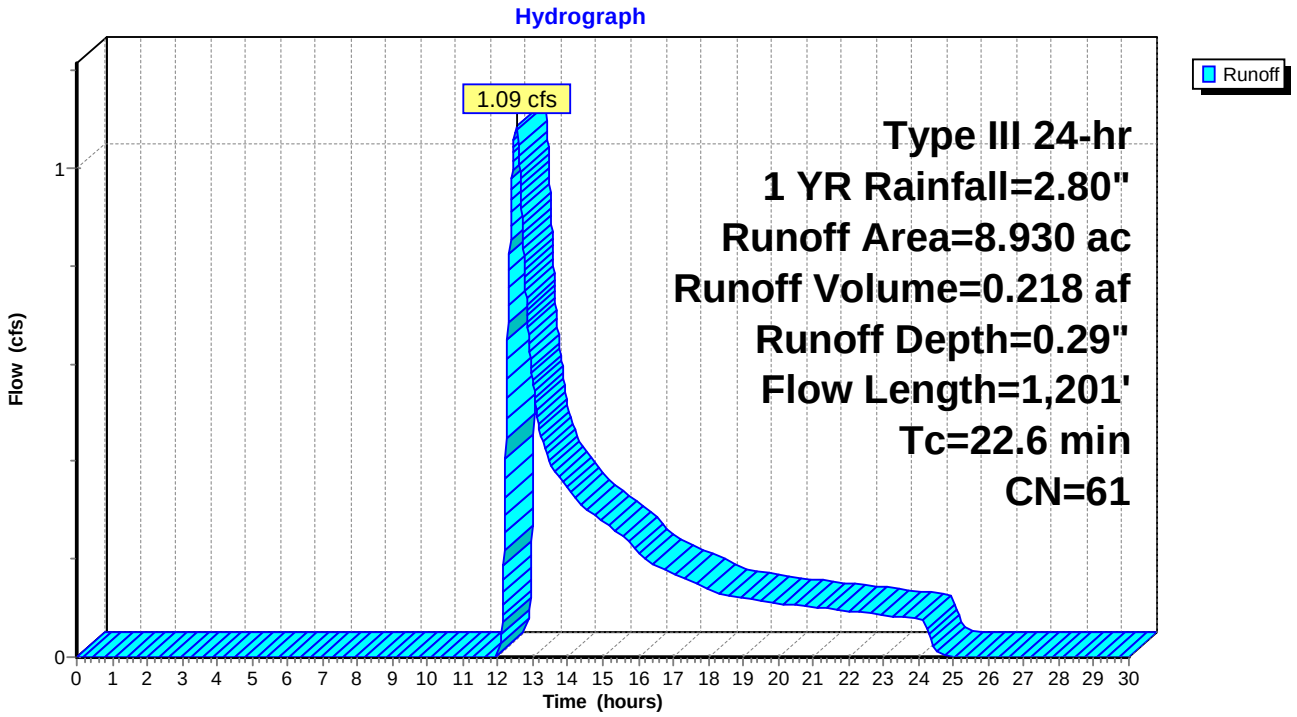
Runoff = 1.09 cfs @ 12.53 hrs, Volume= 0.218 af, Depth= 0.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
1.610	61	>75% Grass cover, Good, HSG B
5.800	55	Woods, Good, HSG B
0.380	98	Water Surface, 0% imp, HSG D
1.120	77	Woods, Good, HSG D
0.020	98	Paved parking, HSG B
8.930	61	Weighted Average
8.910	61	99.78% Pervious Area
0.020	98	0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.8	483	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	327	0.0430	3.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.9	291	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.6	1,201	Total			

Subcatchment 1S: DRAINAGE AREA-1



Summary for Subcatchment 2S: 4.5 UNITS

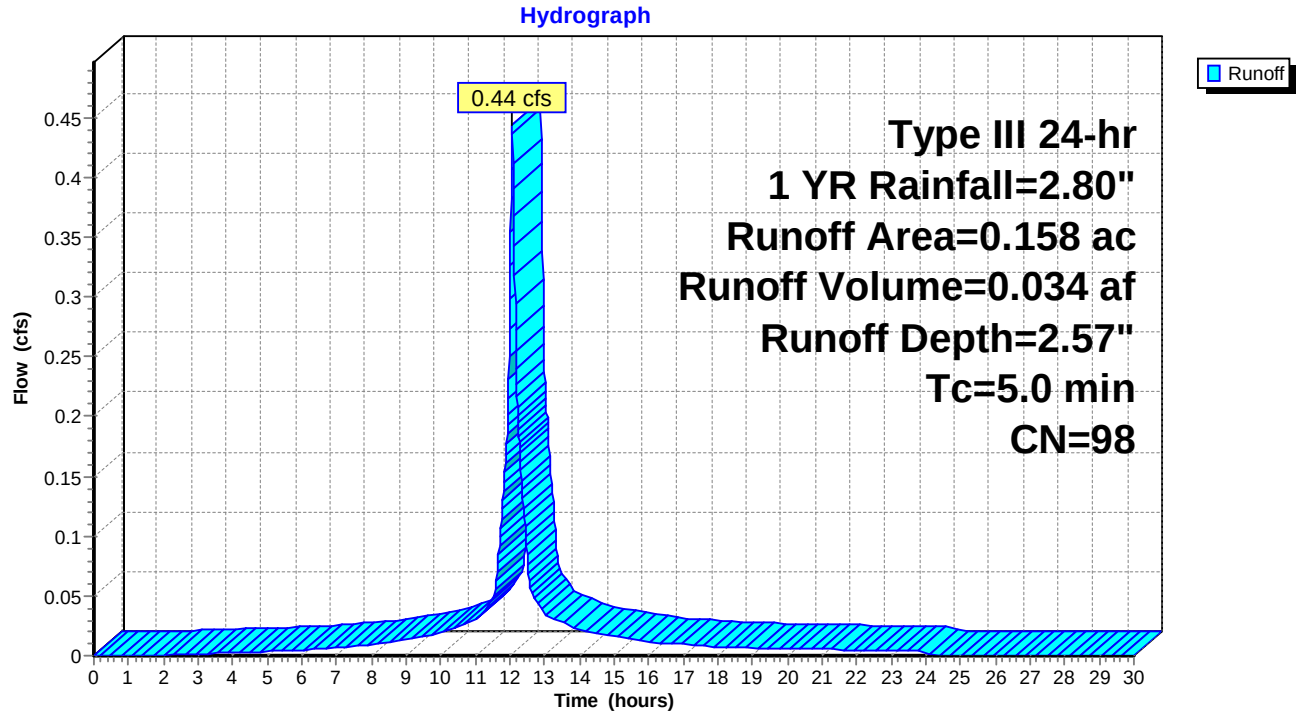
Runoff = 0.44 cfs @ 12.07 hrs, Volume= 0.034 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.158	98	Roofs, HSG B
0.158	98	100.00% Impervious Area

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

Subcatchment 2S: 4.5 UNITS



Summary for Subcatchment 3S: DRAINAGE AREA-2

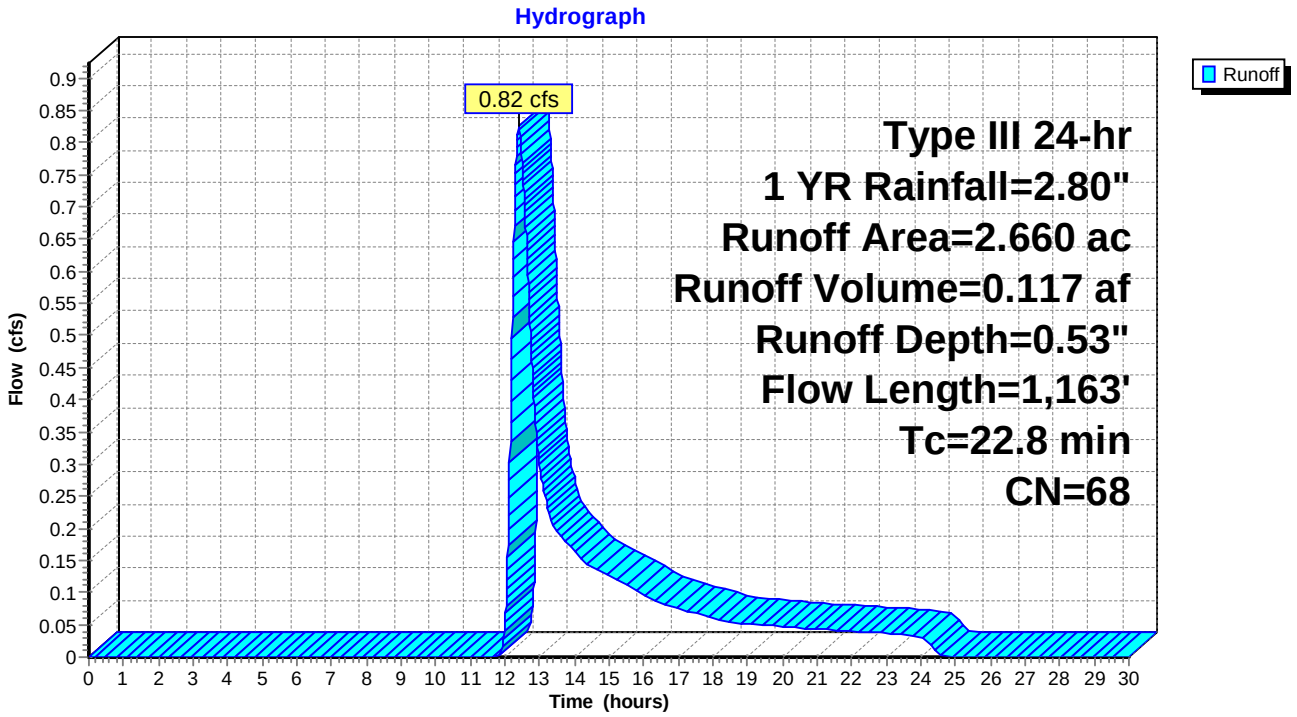
Runoff = 0.82 cfs @ 12.39 hrs, Volume= 0.117 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.350	58	Woods/grass comb., Good, HSG B
0.520	98	Paved parking, HSG B
1.790	61	>75% Grass cover, Good, HSG B
2.660	68	Weighted Average
2.140	61	80.45% Pervious Area
0.520	98	19.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.1	324	0.0300	2.60		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.4	281	0.0490	3.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	67	0.0450	13.73	411.75	**Channel Flow,** Area= 30.0 sf Perim= 32.0' r= 0.94' n= 0.022 Earth, clean & straight
0.1	118	0.0590	15.11	18.54	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.6	273	0.0580	7.68	245.62	**Channel Flow,** Area= 32.0 sf Perim= 62.0' r= 0.52' n= 0.030 Earth, grassed & winding
22.8	1,163	Total			

Subcatchment 3S: DRAINAGE AREA-2



Summary for Subcatchment 4S: 7 UNITS

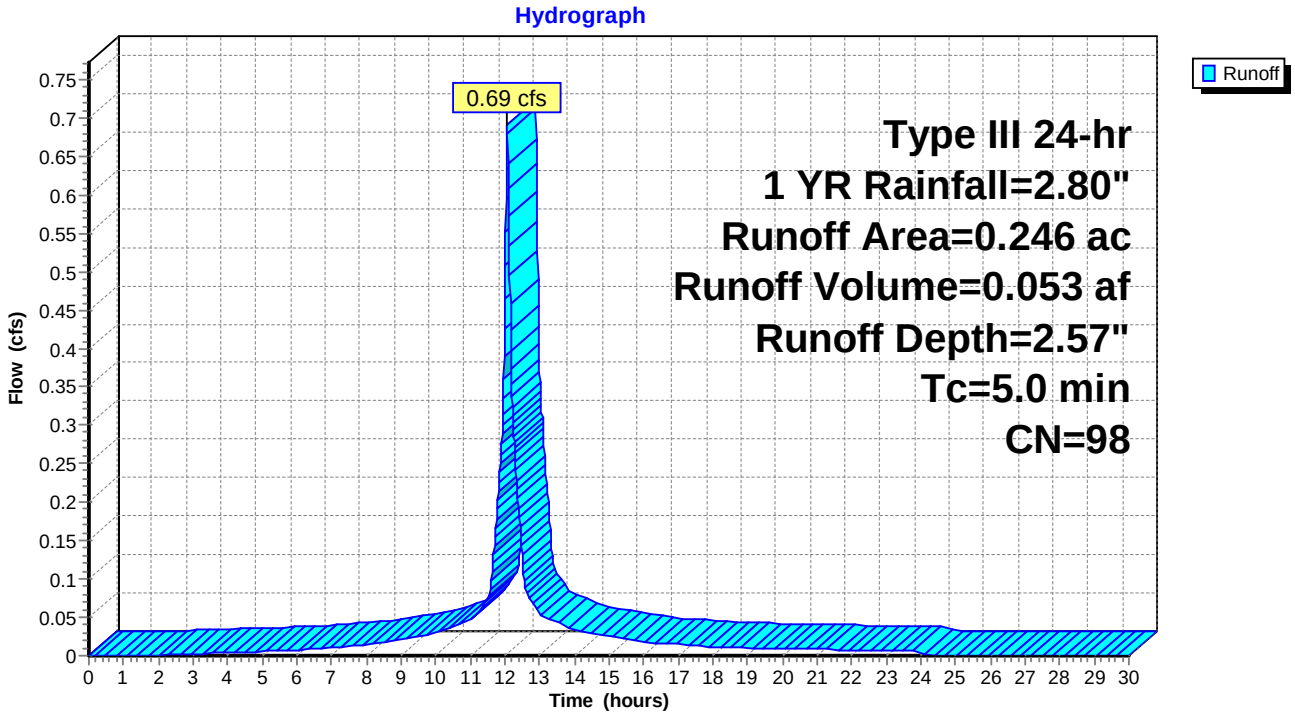
Runoff = 0.69 cfs @ 12.07 hrs, Volume= 0.053 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.246	98	Roofs, HSG B
0.246	98	100.00% Impervious Area

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

Subcatchment 4S: 7 UNITS



Summary for Subcatchment 5S: DRAINAGE AREA-3

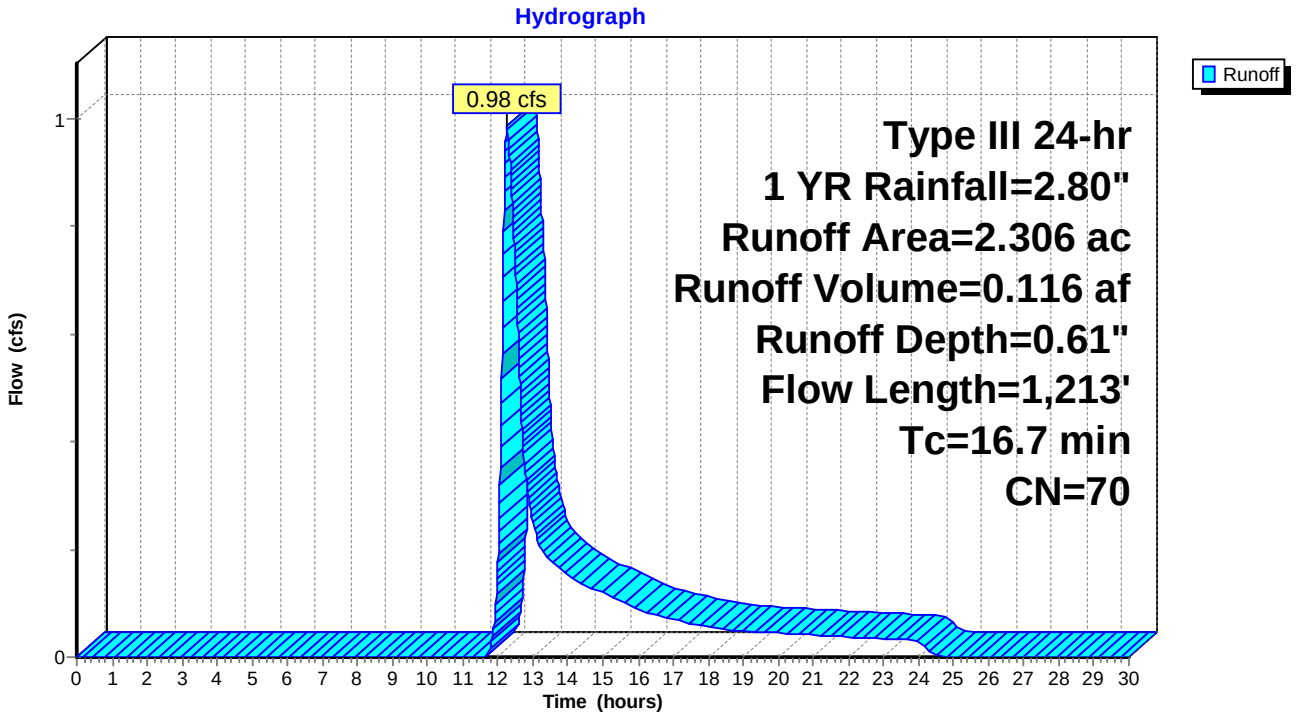
Runoff = 0.98 cfs @ 12.27 hrs, Volume= 0.116 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.353	58	Woods/grass comb., Good, HSG B
0.569	98	Paved parking, HSG B
1.384	61	>75% Grass cover, Good, HSG B
2.306	70	Weighted Average
1.737	60	75.33% Pervious Area
0.569	98	24.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.2	57	0.0700	3.97		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.6	683	0.0400	7.18	84.00	**Channel Flow,** Area= 11.7 sf Perim= 30.2' r= 0.39' n= 0.022 Earth, clean & straight
0.2	100	0.0200	8.80	10.80	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.6	273	0.0580	7.68	245.62	**Channel Flow,** Area= 32.0 sf Perim= 62.0' r= 0.52' n= 0.030 Earth, grassed & winding
16.7	1,213	Total			

Subcatchment 5S: DRAINAGE AREA-3



Summary for Subcatchment 6S: 5.5 UNITS

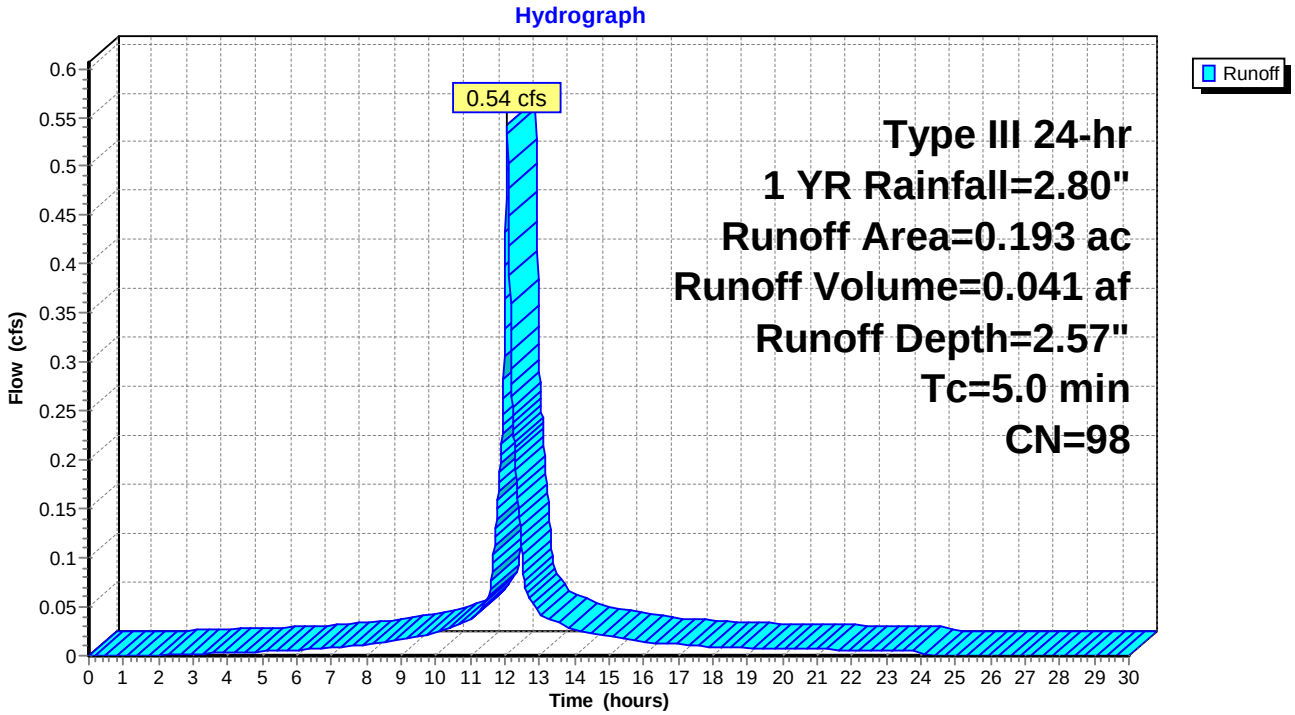
Runoff = 0.54 cfs @ 12.07 hrs, Volume= 0.041 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.193	98	Roofs, HSG B
0.193	98	100.00% Impervious Area

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

Subcatchment 6S: 5.5 UNITS



Summary for Subcatchment 7S: DRAINAGE AREA-4

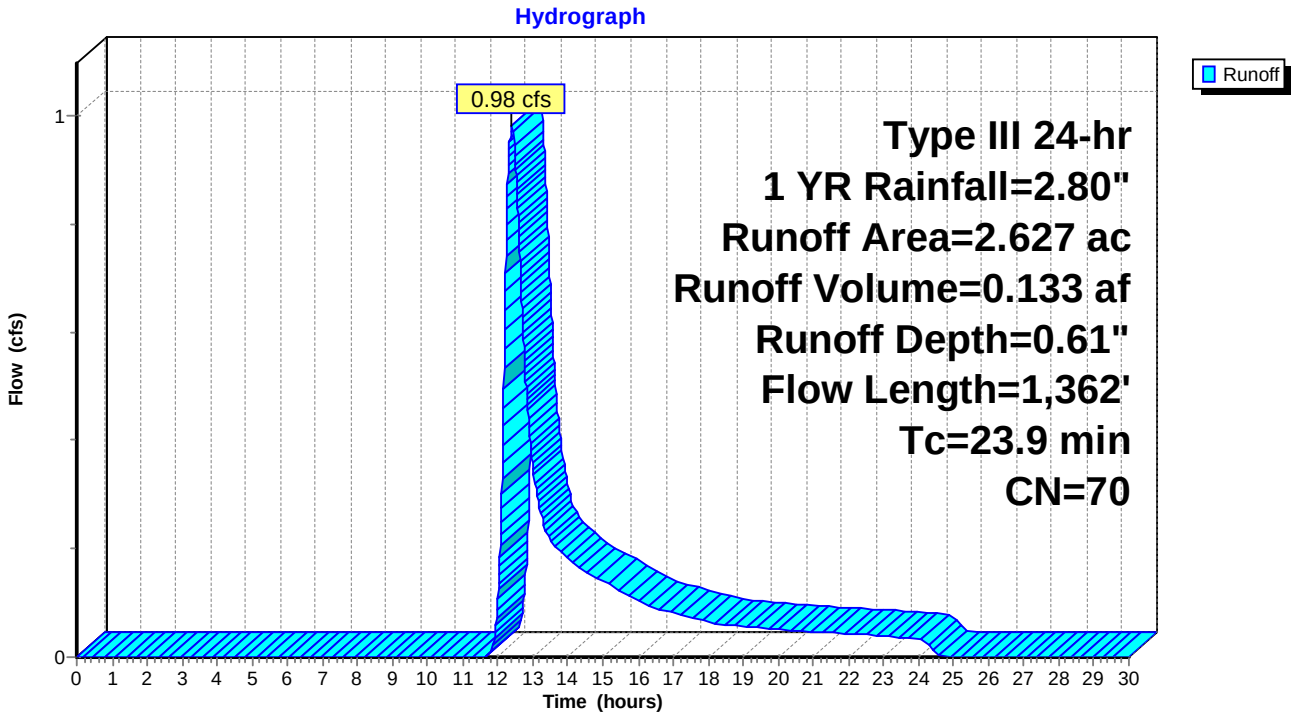
Runoff = 0.98 cfs @ 12.40 hrs, Volume= 0.133 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.620	58	Woods/grass comb., Good, HSG B
0.670	98	Water Surface, 0% imp, HSG B
1.337	61	>75% Grass cover, Good, HSG B
2.627	70	Weighted Average
2.627	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
4.2	658	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	58	0.1700	6.18		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	273	0.0580	11.43	342.80	**Channel Flow,** Area= 30.0 sf Perim= 32.0' r= 0.94' n= 0.030 Earth, grassed & winding
0.6	273	0.0580	7.35	220.57	**Channel Flow,** Area= 30.0 sf Perim= 62.0' r= 0.48' n= 0.030 Earth, grassed & winding
23.9	1,362	Total			

Subcatchment 7S: DRAINAGE AREA-4



Summary for Subcatchment 8S: 2 UNITS

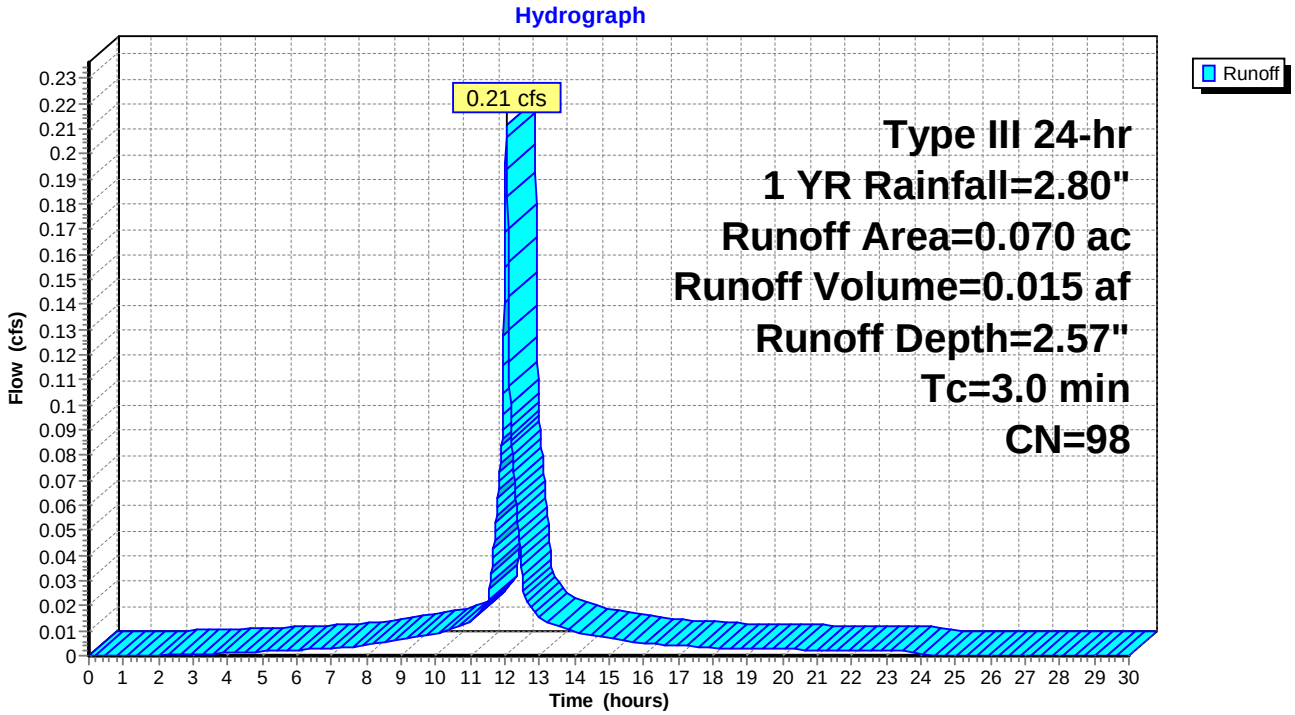
Runoff = 0.21 cfs @ 12.04 hrs, Volume= 0.015 af, Depth= 2.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 1 YR Rainfall=2.80"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
0.070	98	100.00% Impervious Area

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

Subcatchment 8S: 2 UNITS



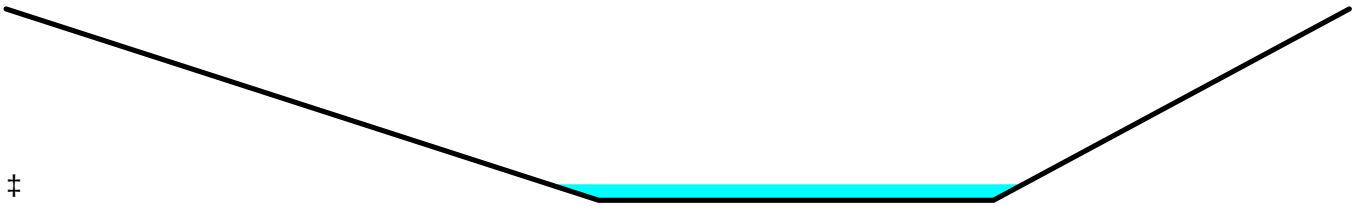
Summary for Reach 4R: SWALE

Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 0.70" for 1 YR event
Inflow = 1.03 cfs @ 12.35 hrs, Volume= 0.169 af
Outflow = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af, Atten= 0%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Max. Velocity= 2.32 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 6.0 min

Peak Storage= 131 cf @ 12.38 hrs
Average Depth at Peak Storage= 0.10'
Bank-Full Depth= 1.20' Flow Area= 10.6 sf, Capacity= 100.51 cfs

4.00' x 1.20' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 5.0 3.0 '/' Top Width= 13.60'
Length= 297.0' Slope= 0.0370 '/'
Inlet Invert= 72.00', Outlet Invert= 61.00'



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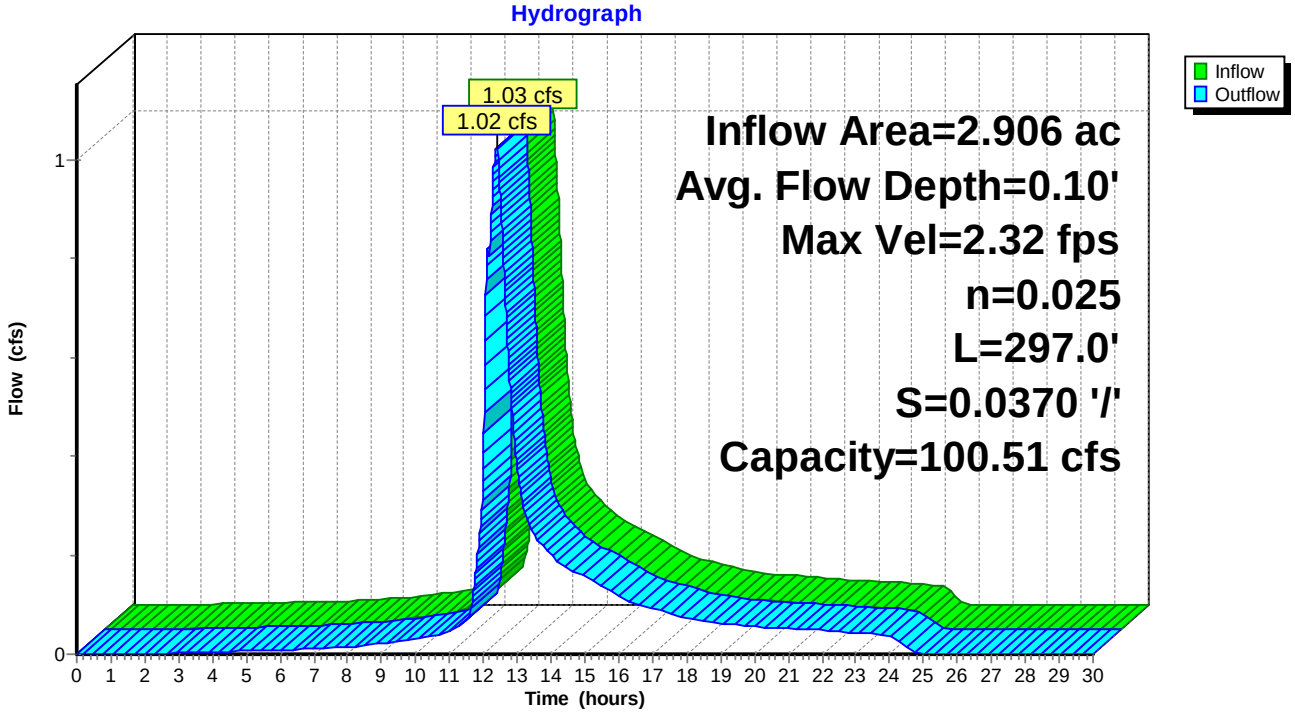
Reach 4R: SWALE



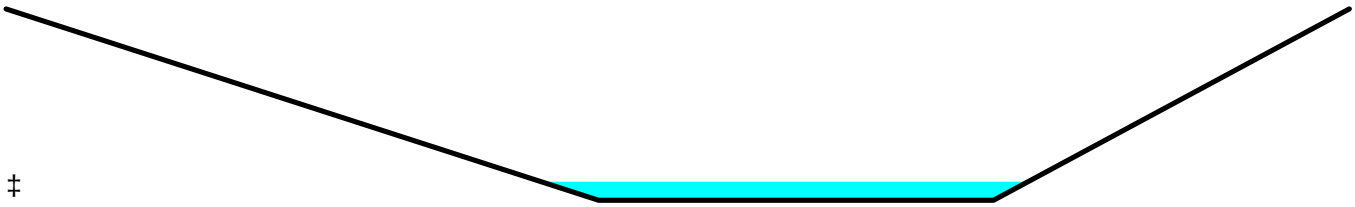
Summary for Reach 5R: SWALE

Inflow Area = 2.499 ac, 30.49% Impervious, Inflow Depth = 0.76" for 1 YR event
Inflow = 1.20 cfs @ 12.25 hrs, Volume= 0.158 af
Outflow = 1.18 cfs @ 12.29 hrs, Volume= 0.158 af, Atten= 2%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Max. Velocity= 2.29 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 11.7 min

Peak Storage= 270 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.20' Flow Area= 10.6 sf, Capacity= 91.17 cfs

4.00' x 1.20' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 5.0 3.0 '/' Top Width= 13.60'
Length= 525.0' Slope= 0.0305 '/'
Inlet Invert= 80.00', Outlet Invert= 64.00'



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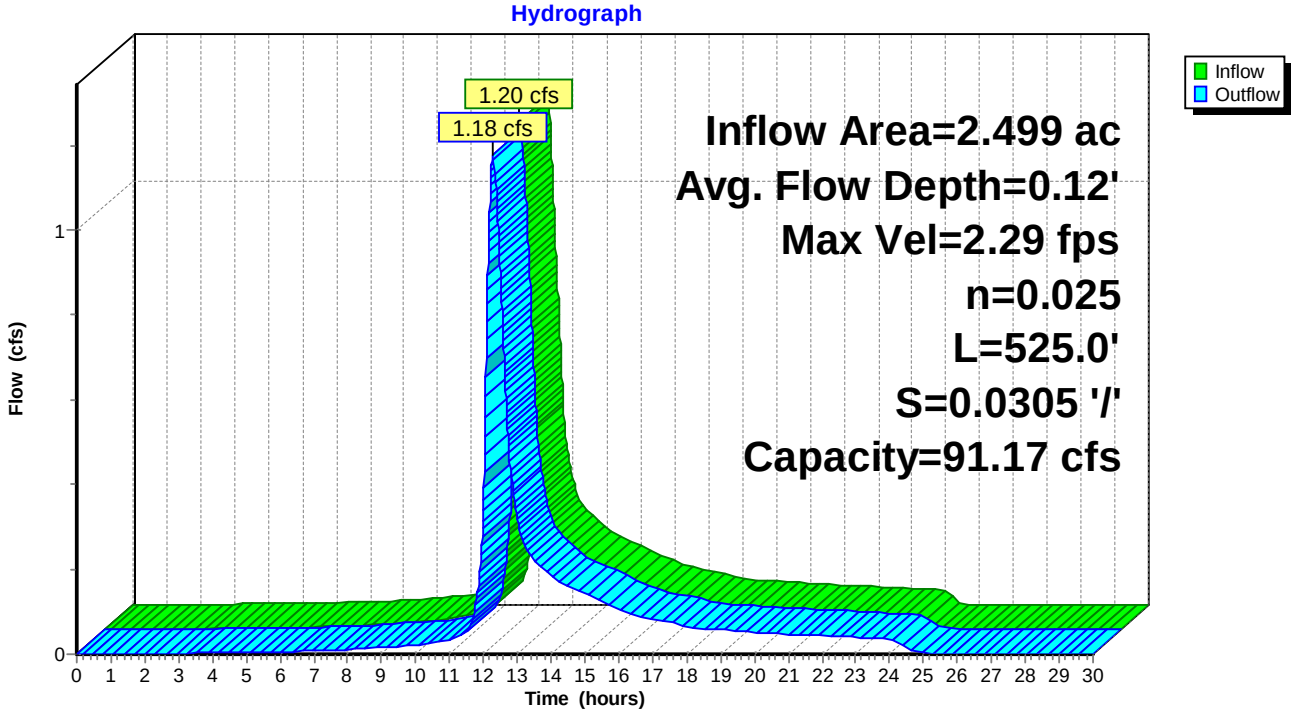
Reach 5R: SWALE



Summary for Pond 2P: OUTLET

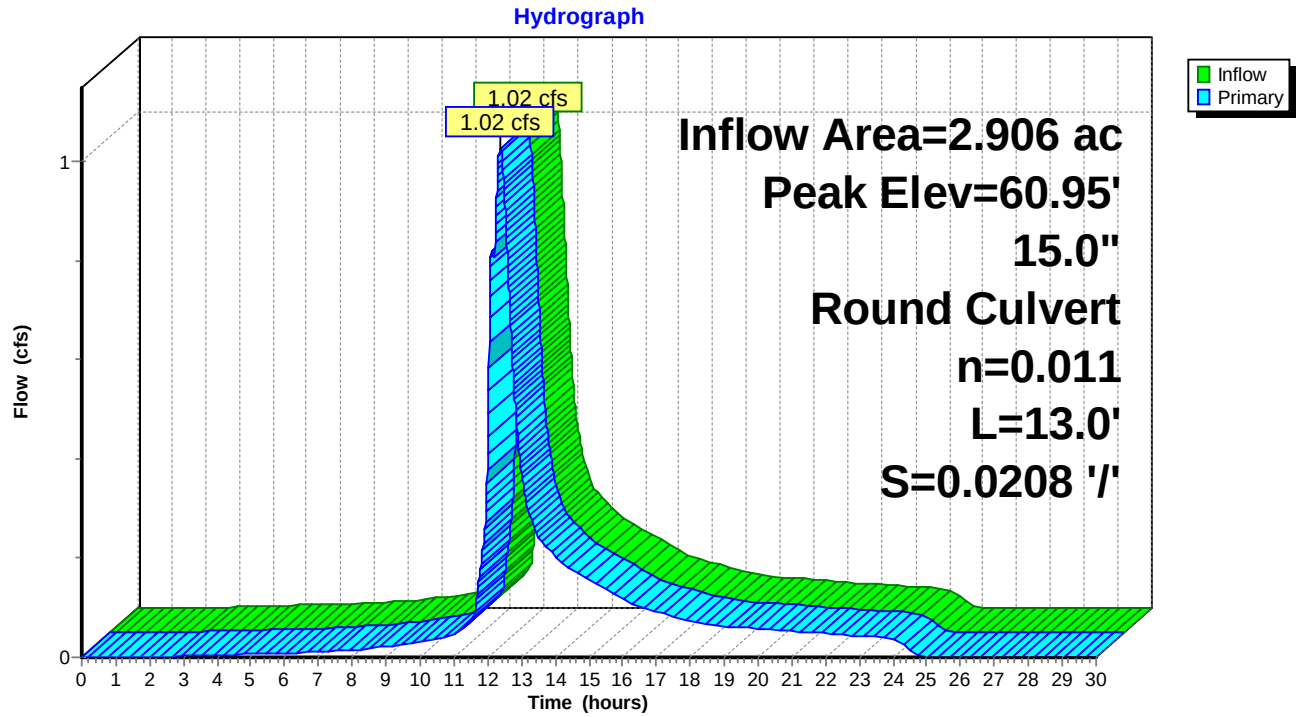
Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 0.70" for 1 YR event
Inflow = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af
Outflow = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.0 min
Primary = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 60.95' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	60.47'	**15.0" Round Culvert** L= 13.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 60.47' / 60.20' S= 0.0208 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.02 cfs @ 12.38 hrs HW=60.95' TW=60.55' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.02 cfs @ 2.36 fps)

Pond 2P: OUTLET



Summary for Pond 4P: OUTLET

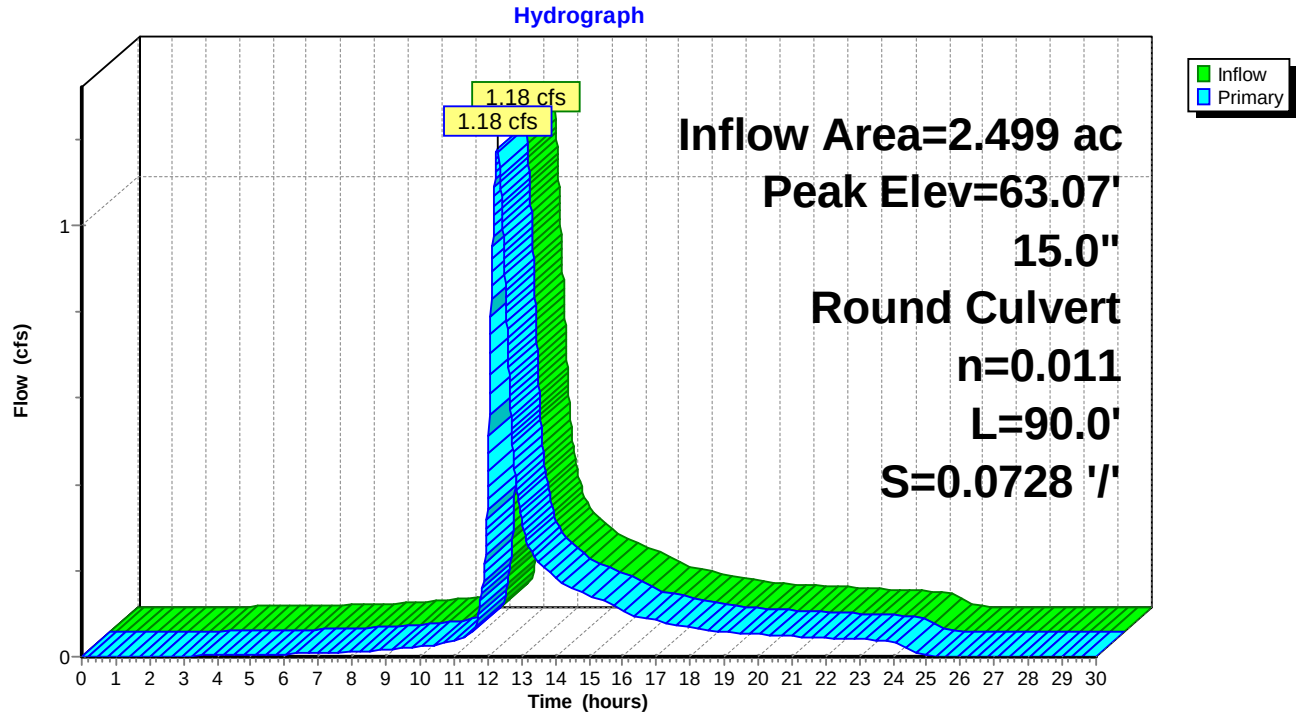
Inflow Area = 2.499 ac, 30.49% Impervious, Inflow Depth = 0.76" for 1 YR event
Inflow = 1.18 cfs @ 12.29 hrs, Volume= 0.158 af
Outflow = 1.18 cfs @ 12.29 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
Primary = 1.18 cfs @ 12.29 hrs, Volume= 0.158 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 63.07' @ 12.29 hrs
Flood Elev= 64.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**15.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 62.55' / 56.00' S= 0.0728 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.23 sf

Primary OutFlow Max=1.18 cfs @ 12.29 hrs HW=63.07' TW=55.23' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.18 cfs @ 2.45 fps)

Pond 4P: OUTLET



Summary for Pond 6P: DMH

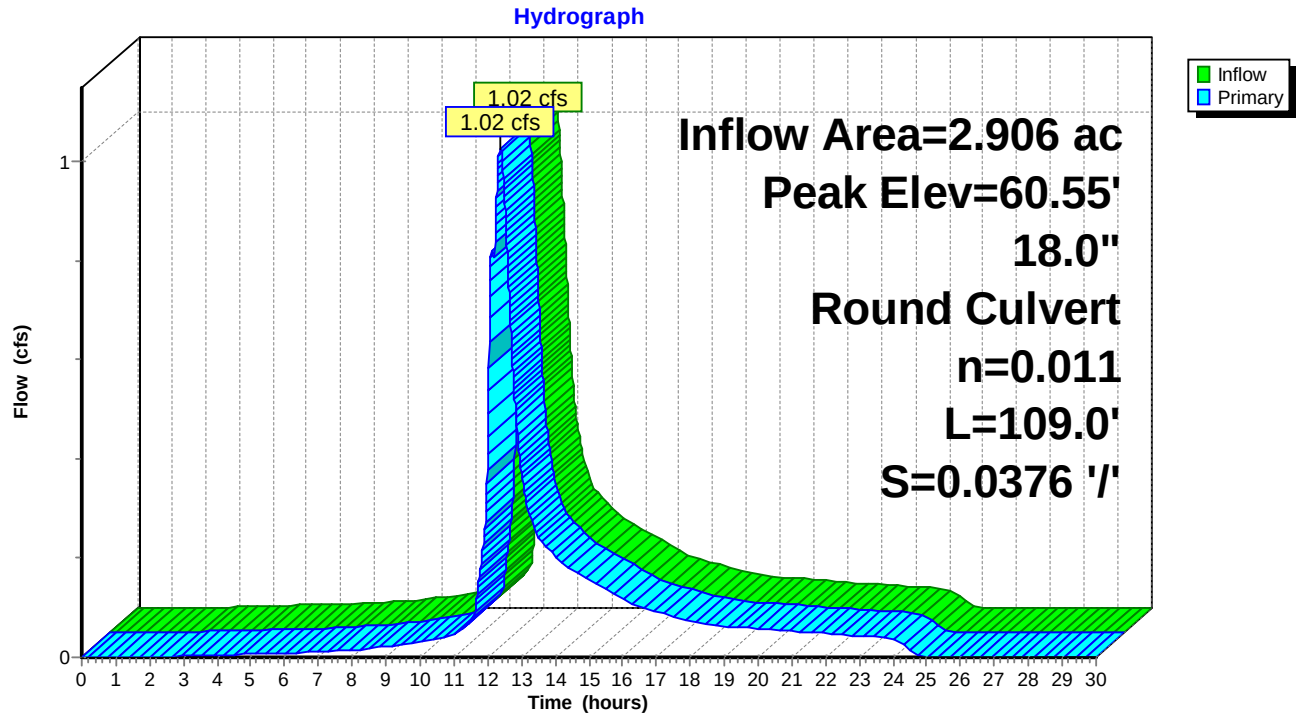
Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 0.70" for 1 YR event
Inflow = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af
Outflow = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af, Atten= 0%, Lag= 0.0 min
Primary = 1.02 cfs @ 12.38 hrs, Volume= 0.169 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 60.55' @ 12.38 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	60.10'	**18.0" Round Culvert** L= 109.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 60.10' / 56.00' S= 0.0376 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=1.02 cfs @ 12.38 hrs HW=60.55' TW=55.31' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.02 cfs @ 2.29 fps)

Pond 6P: DMH



Summary for Pond 8P: INFIL./DET. POND

Inflow Area = 8.102 ac, 19.72% Impervious, Inflow Depth = 0.70" for 1 YR event
Inflow = 3.18 cfs @ 12.35 hrs, Volume= 0.475 af
Outflow = 0.36 cfs @ 15.79 hrs, Volume= 0.475 af, Atten= 89%, Lag= 206.7 min
Discarded = 0.36 cfs @ 15.79 hrs, Volume= 0.475 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 55.74' @ 15.79 hrs Surf.Area= 15,167 sf Storage= 9,121 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 286.9 min (1,161.1 - 874.2)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	121,242 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

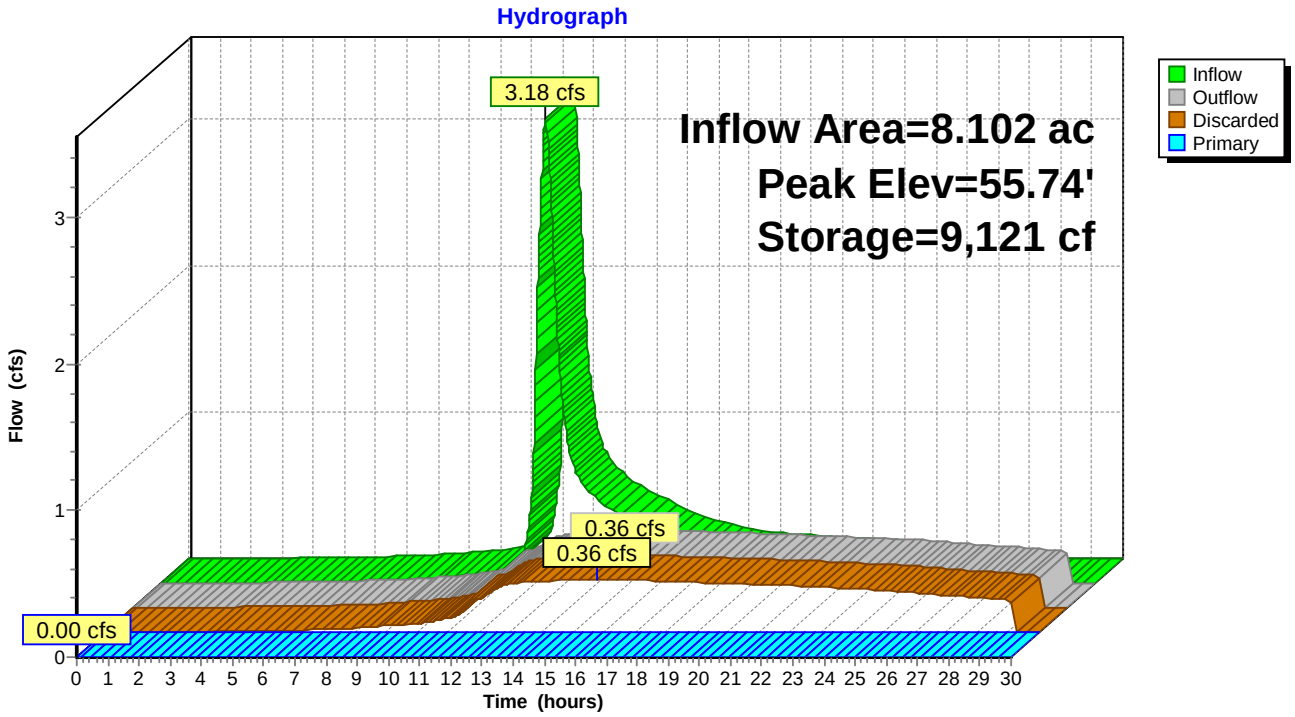
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	9,400	0	0
56.00	17,167	13,284	13,284
58.00	22,907	40,074	53,358
60.00	29,297	52,204	105,562
60.50	33,423	15,680	121,242

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	59.00'	**24.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.36 cfs @ 15.79 hrs HW=55.74' (Free Discharge)
1=Exfiltration (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.00' TW=0.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 8P: INFIL./DET. POND

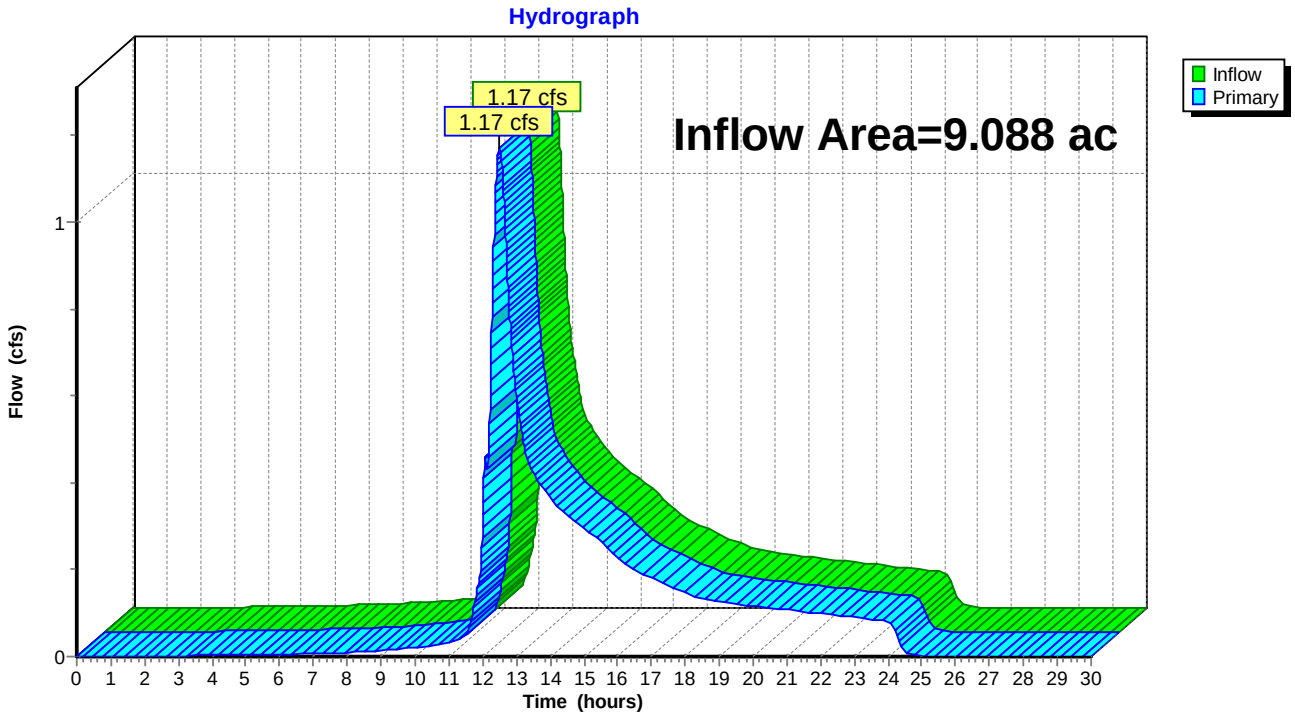


Summary for Link 1L: DRAINAGE AREA-1 TOTAL

Inflow Area = 9.088 ac, 1.96% Impervious, Inflow Depth = 0.33" for 1 YR event
Inflow = 1.17 cfs @ 12.48 hrs, Volume= 0.251 af
Primary = 1.17 cfs @ 12.48 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 1L: DRAINAGE AREA-1 TOTAL

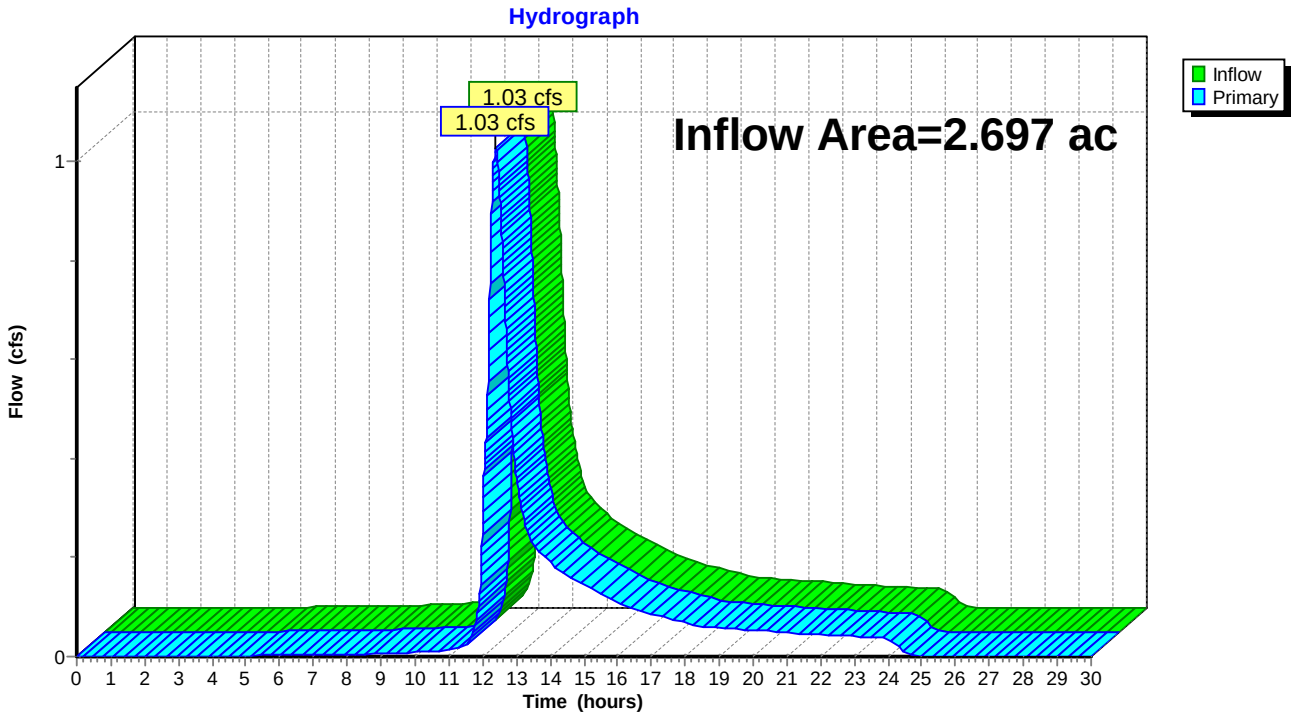


Summary for Link 2L: DRAINAGE AREA-4 TOTAL

Inflow Area = 2.697 ac, 2.60% Impervious, Inflow Depth = 0.66" for 1 YR event
Inflow = 1.03 cfs @ 12.39 hrs, Volume= 0.148 af
Primary = 1.03 cfs @ 12.39 hrs, Volume= 0.148 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 2L: DRAINAGE AREA-4 TOTAL

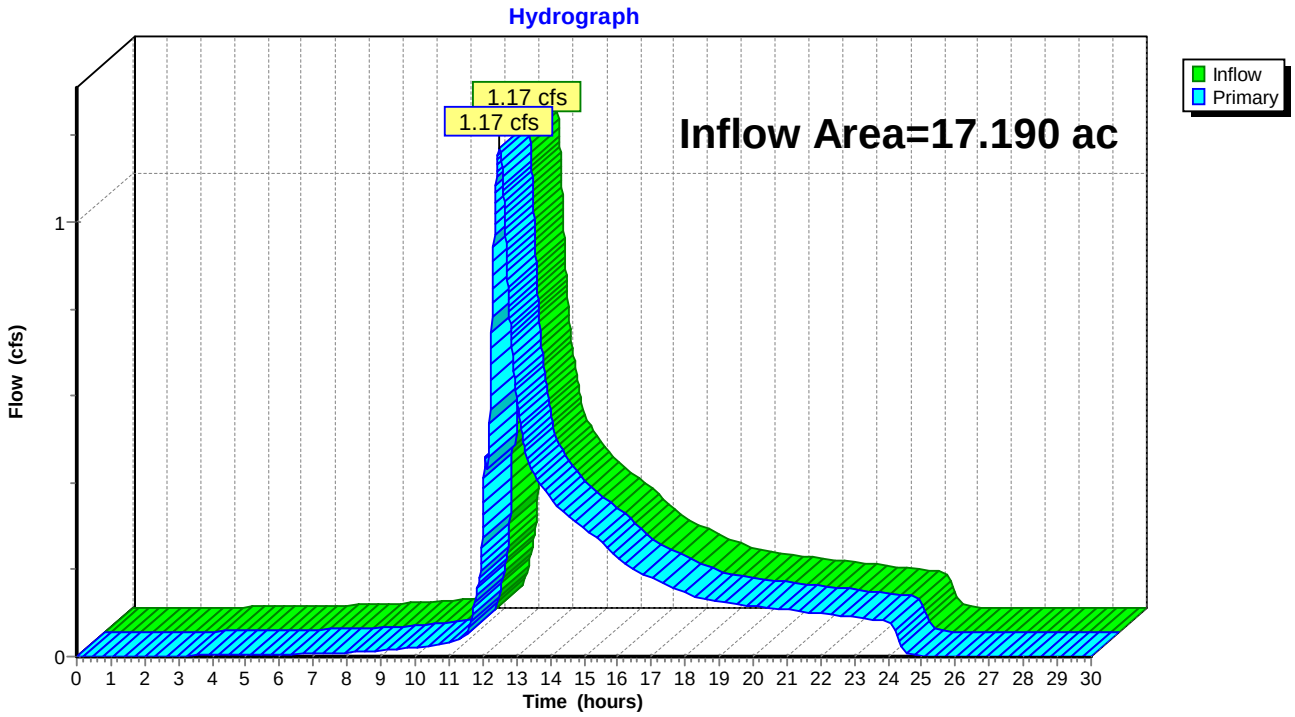


Summary for Link 3L: TOTAL DEVELOPMENT AREA

Inflow Area = 17.190 ac, 10.33% Impervious, Inflow Depth = 0.18" for 1 YR event
Inflow = 1.17 cfs @ 12.48 hrs, Volume= 0.251 af
Primary = 1.17 cfs @ 12.48 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Link 3L: TOTAL DEVELOPMENT AREA



Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 9
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 1S: DRAINAGE AREA-1 Runoff Area=8.930 ac 0.22% Impervious Runoff Depth=1.31"
Flow Length=1,201' Tc=22.6 min CN=61 Runoff=7.88 cfs 0.974 af

Subcatchment 2S: 4.5 UNITS Runoff Area=0.158 ac 100.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=98 Runoff=0.78 cfs 0.061 af

Subcatchment 3S: DRAINAGE AREA-2 Runoff Area=2.660 ac 19.55% Impervious Runoff Depth=1.81"
Flow Length=1,163' Tc=22.8 min CN=68 Runoff=3.47 cfs 0.401 af

Subcatchment 4S: 7 UNITS Runoff Area=0.246 ac 100.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=98 Runoff=1.22 cfs 0.096 af

Subcatchment 5S: DRAINAGE AREA-3 Runoff Area=2.306 ac 24.67% Impervious Runoff Depth=1.96"
Flow Length=1,213' Tc=16.7 min CN=70 Runoff=3.76 cfs 0.377 af

Subcatchment 6S: 5.5 UNITS Runoff Area=0.193 ac 100.00% Impervious Runoff Depth=4.66"
Tc=5.0 min CN=98 Runoff=0.96 cfs 0.075 af

Subcatchment 7S: DRAINAGE AREA-4 Runoff Area=2.627 ac 0.00% Impervious Runoff Depth=1.96"
Flow Length=1,362' Tc=23.9 min CN=70 Runoff=3.69 cfs 0.430 af

Subcatchment 8S: 2 UNITS Runoff Area=0.070 ac 100.00% Impervious Runoff Depth=4.66"
Tc=3.0 min CN=98 Runoff=0.37 cfs 0.027 af

Reach 4R: SWALE Avg. Flow Depth=0.22' Max Vel=3.67 fps Inflow=3.88 cfs 0.497 af
n=0.025 L=297.0' S=0.0370 '/' Capacity=100.51 cfs Outflow=3.87 cfs 0.497 af

Reach 5R: SWALE Avg. Flow Depth=0.24' Max Vel=3.51 fps Inflow=4.17 cfs 0.452 af
n=0.025 L=525.0' S=0.0305 '/' Capacity=91.17 cfs Outflow=4.11 cfs 0.452 af

Pond 2P: OUTLET Peak Elev=61.57' Inflow=3.87 cfs 0.497 af
15.0" Round Culvert n=0.011 L=13.0' S=0.0208 '/' Outflow=3.87 cfs 0.497 af

Pond 4P: OUTLET Peak Elev=63.66' Inflow=4.11 cfs 0.452 af
15.0" Round Culvert n=0.011 L=90.0' S=0.0728 '/' Outflow=4.11 cfs 0.452 af

Pond 6P: DMH Peak Elev=61.04' Inflow=3.87 cfs 0.497 af
18.0" Round Culvert n=0.011 L=109.0' S=0.0376 '/' Outflow=3.87 cfs 0.497 af

Pond 8P: INFIL./DET. POND Peak Elev=57.39' Storage=39,908 cf Inflow=11.56 cfs 1.405 af
Discarded=0.50 cfs 0.781 af Primary=0.00 cfs 0.000 af Outflow=0.50 cfs 0.781 af

Link 1L: DRAINAGE AREA-1 TOTAL Inflow=8.13 cfs 1.036 af
Primary=8.13 cfs 1.036 af

Link 2L: DRAINAGE AREA-4 TOTAL Inflow=3.79 cfs 0.457 af
Primary=3.79 cfs 0.457 af

Link 3L: TOTAL DEVELOPMENT AREA

Inflow=8.13 cfs 1.036 af
Primary=8.13 cfs 1.036 af

Total Runoff Area = 17.190 ac Runoff Volume = 2.441 af Average Runoff Depth = 1.70"
89.67% Pervious = 15.414 ac 10.33% Impervious = 1.776 ac

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 9
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 1S: DRAINAGE AREA-1 Runoff Area=8.930 ac 0.22% Impervious Runoff Depth=3.83"
Flow Length=1,201' Tc=22.6 min CN=61 Runoff=25.41 cfs 2.850 af

Subcatchment 2S: 4.5 UNITS Runoff Area=0.158 ac 100.00% Impervious Runoff Depth=8.26"
Tc=5.0 min CN=98 Runoff=1.37 cfs 0.109 af

Subcatchment 3S: DRAINAGE AREA-2 Runoff Area=2.660 ac 19.55% Impervious Runoff Depth=4.66"
Flow Length=1,163' Tc=22.8 min CN=68 Runoff=9.26 cfs 1.033 af

Subcatchment 4S: 7 UNITS Runoff Area=0.246 ac 100.00% Impervious Runoff Depth=8.26"
Tc=5.0 min CN=98 Runoff=2.13 cfs 0.169 af

Subcatchment 5S: DRAINAGE AREA-3 Runoff Area=2.306 ac 24.67% Impervious Runoff Depth=4.90"
Flow Length=1,213' Tc=16.7 min CN=70 Runoff=9.62 cfs 0.941 af

Subcatchment 6S: 5.5 UNITS Runoff Area=0.193 ac 100.00% Impervious Runoff Depth=8.26"
Tc=5.0 min CN=98 Runoff=1.67 cfs 0.133 af

Subcatchment 7S: DRAINAGE AREA-4 Runoff Area=2.627 ac 0.00% Impervious Runoff Depth=4.90"
Flow Length=1,362' Tc=23.9 min CN=70 Runoff=9.42 cfs 1.072 af

Subcatchment 8S: 2 UNITS Runoff Area=0.070 ac 100.00% Impervious Runoff Depth=8.26"
Tc=3.0 min CN=98 Runoff=0.65 cfs 0.048 af

Reach 4R: SWALE Avg. Flow Depth=0.37' Max Vel=4.97 fps Inflow=10.01 cfs 1.202 af
n=0.025 L=297.0' S=0.0370 '/' Capacity=100.51 cfs Outflow=9.99 cfs 1.202 af

Reach 5R: SWALE Avg. Flow Depth=0.39' Max Vel=4.68 fps Inflow=10.36 cfs 1.074 af
n=0.025 L=525.0' S=0.0305 '/' Capacity=91.17 cfs Outflow=10.27 cfs 1.074 af

Pond 2P: OUTLET Peak Elev=65.09' Inflow=9.99 cfs 1.202 af
15.0" Round Culvert n=0.011 L=13.0' S=0.0208 '/' Outflow=9.99 cfs 1.202 af

Pond 4P: OUTLET Peak Elev=66.19' Inflow=10.27 cfs 1.074 af
15.0" Round Culvert n=0.011 L=90.0' S=0.0728 '/' Outflow=10.27 cfs 1.074 af

Pond 6P: DMH Peak Elev=62.23' Inflow=9.99 cfs 1.202 af
18.0" Round Culvert n=0.011 L=109.0' S=0.0376 '/' Outflow=9.99 cfs 1.202 af

Pond 8P: INFIL./DET. POND Peak Elev=59.16' Storage=82,146 cf Inflow=29.33 cfs 3.396 af
Discarded=0.63 cfs 1.024 af Primary=3.99 cfs 0.866 af Outflow=4.62 cfs 1.890 af

Link 1L: DRAINAGE AREA-1 TOTAL Inflow=25.87 cfs 2.959 af
Primary=25.87 cfs 2.959 af

Link 2L: DRAINAGE AREA-4 TOTAL Inflow=9.61 cfs 1.120 af
Primary=9.61 cfs 1.120 af

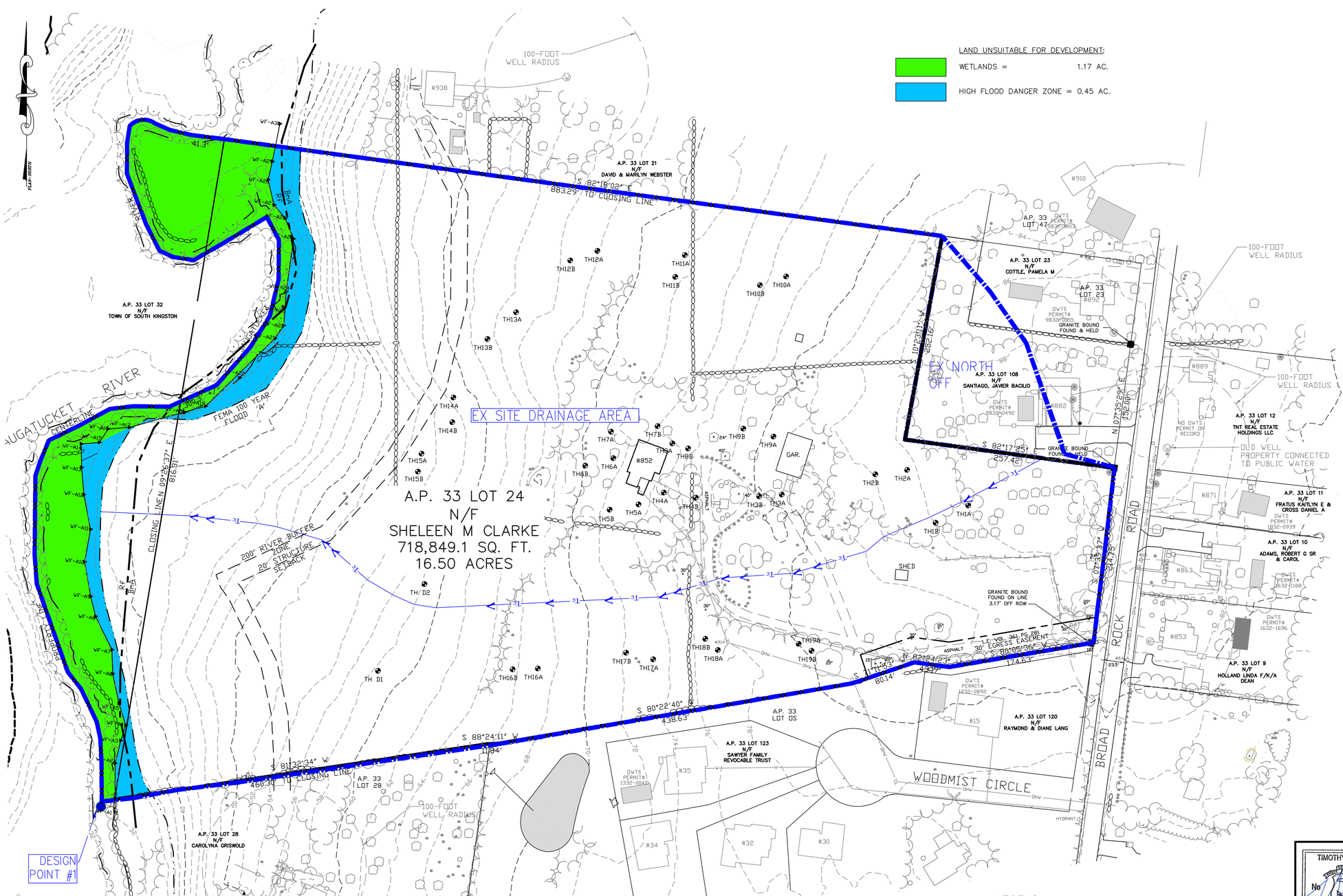
Link 3L: TOTAL DEVELOPMENT AREA

Inflow=25.87 cfs 3.825 af
Primary=25.87 cfs 3.825 af

Total Runoff Area = 17.190 ac Runoff Volume = 6.355 af Average Runoff Depth = 4.44"
89.67% Pervious = 15.414 ac 10.33% Impervious = 1.776 ac

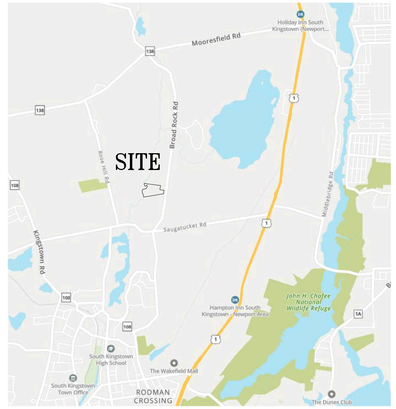
APPENDIX-2

WATERSHED MAPS



EXISTING CONDITIONS WATERSHED MAP

SCALE: 1" = 60'



LOCUS MAP

NOT TO SCALE

NOTES:

1.
2. EXISTING PARCEL, (A.P. 33 LOT 24) CONSIST OF 16.50±ACRES THAT ARE ZONED R-40.
3. WETLAND FLAGS DELINEATED BY AVIZINIS ENVIRONMENTAL SERVICES, INC. 2022.
4. OFF SITE BUILDING LOCATIONS ARE APPROXIMATE AND HAVE BEEN TAKEN FROM AERIAL PHOTOGRAPHY.
5. ABUTTING PROPERTY OWTS' TAKEN FROM PLANS OF RECORD.
6. ELEVATIONS BASED ON NAVD88 VERTICAL DATUM.
7. A SMALL PORTION OF SUBJECT SITE IS SITUATED IN FEMA 100-YR FLOOD ZONE 'A' AS DEPICTED ON MAP 44009C0201J, EFFECTIVE 4/3/2020. THE REMAINING PORTION OF THE SITE IS SITUATED IN ZONE 'X' WHICH IS AREA OF MINIMAL FLOOD HAZARD.
8. THE BmA SOIL TYPE IS CONSIDERED A 'PRIME AGRICULTURAL SOIL'..
9. THIS IS NOT A SURVEY BOUNDARY PLAN, REFER TO SURVEY PLAN AT THE REAR OF THE PLAN SET. SURVEY INFORMATION PROVIDED BY COMMONWEALTH LAND SURVEYORS, INC.

DRAWING ISSUE:

- ☐ *CONCEPT*
- ☐ *CUSTOMER APPROVAL*
- ☒ *PERMITTING*
- ☐ *CONSTRUCTION*
- ☐ *AS-BUILT*
- ☐ *OTHER:*

ONLY PLANS ISSUED FOR CONSTRUCTION SHALL BE USED FOR CONSTRUCTION

OWNER:
SHELEEN CLARKE
96 DUCK COVE ROAD
NORTH KINGSTOWN, RI 02852

APPLICANT:
NEW ENGLAND PROPERTIES, LLC
257 WICKFORD CT.
NORTH KINGSTOWN, RI 02852

LEGEND

ABUTTER LINE		BUILDING SETBACK LINE	
LOT LINE		EXISTING CONTOUR	122
EDGE OF ROAD PAVEMENT		EXISTING SPOT GRADE	x123.0
RIGHT OF WAY CENTERLINE		PROPOSED LOT CONTOUR	82
ROADWAY STATION	2+00	PROPOSED SPOT GRADE	x63.50
TEST HOLE	TH	DRAINAGE MANHOLE	DMH
PERC TEST	PT	HYDRANT	
LEDGE TEST	LT	DRAIN LINE	D
UTILITY POLE		WATERLINE	W
WETLAND EDGE	WF-A6 WF-A7	OVERHEAD WIRES	OHW
200' RIVER BUFFER ZONE		UNDERGROUND ELECTRIC/TELE.	E
20' STRUCTURE SETBACK		SOIL BOUNDARY LINE	
EXISTING STONEWALL		FEMA 100-YR FLOOD ZONE	
UNDERGROUND TELE/COMM	T	CURB STOP	
		WATER VALVE	WV
		PROPOSED STONE WALL	

TIMOTHY J. BEHAN
No 6278
REGISTERED PROFESSIONAL ENGINEER
10/21/2024

REVISIONS

No.	DATE	DRWN	CHKD
1	4/2/24	TB	TB
2	4/18/24	TB	TB
3	9/6/24	SMA	TB
4	9/30/24	SMA	TB
5	10/21/24	SMA	TB

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RHODE ISLAND 02908
(401) 273-6600

PERMIT AGENCY REVIEW PLAN
FOR
VILLAGE AT BROAD ROCK
PLAT 33, LOT 24
ON
BROAD ROCK ROAD
SOUTH KINGSTOWN, RHODE ISLAND
EXISTING WATERSHED MAP

SCALE: AS SHOWN		SHEET NO: 1 OF 2
DRAWN BY: SMA	DESIGN BY: SMA	CHECKED BY: TJB
DATE: AUGUST 2024		PROJECT NO 23011.00

LAND UNSUITABLE FOR DEVELOPMENT:

WETLANDS = 1.17 AC.

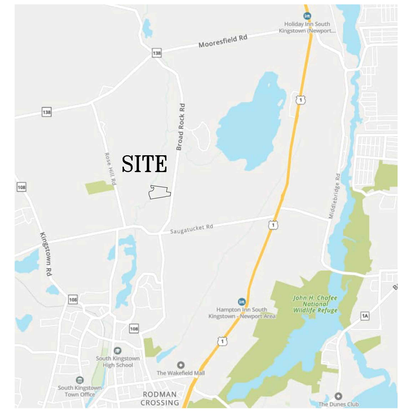
HIGH FLOOD DANGER ZONE = 0.45 AC.

ZONING TABLE:

ZONE:	R-40
A.P./LOT	33/24
LOT AREA	16.50 AC.

R-40 ZONING REGULATIONS:

AREA	40,000 SQ. FT.
FRONTAGE	150 FT.
WIDTH	150 FT.
BLDG. COVERAGE	20%
HEIGHT (PRINC.)	35 FT.
HEIGHT (ACCESS.)	20 FT.
FRONT YARD	40 FT.
CORNER SIDE	30 FT.
SIDE YARD	20 FT.
REAR YARD	40 FT.
ACCESS. BLDG. SIDE	15 FT.
ACCESS. BLDG. REAR	10 FT.
OWTS TO WETLAND	150 FT.



LOCUS MAP
NOT TO SCALE

STORMWATER MODELING NOTES:

1. FOR THE WATER QUALITY STORM, THE PROPOSED HOUSES ARE MODELED IN THE DRAINAGE AREA THAT THE INFILTRATION CHAMBERS ARE LOCATED IN, AS THAT IS THE AREA WHERE THE INFILTRATION WILL TAKE PLACE. FOR THIS MODEL, THERE ARE THREE (3) PROPOSED UNITS IN DRAINAGE AREA-1, SEVEN (7) PROPOSED UNITS IN DRAINAGE AREA-2, NINE (9) PROPOSED UNITS IN DRAINAGE AREA-3 AND NO PROPOSED UNITS IN DRAINAGE AREA-4. THE REMAINING IMPERVIOUS AREAS FLOW TO THE INFILTRATION/DETENTION BASIN.

2. FOR THE 1, 10, 25 AND 100-YEAR STORMS, THE INFILTRATION CHAMBERS HAVE BEEN REMOVED AND THE MODEL ASSUMES THE ROOFS WILL DRAIN TO THE GROUND SURFACE AND FOLLOW THE GRADING. AS SUCH, FOR SOME UNITS, HALF THE ROOF WILL DISCHARGE TO ONE DRAINAGE AREA AND HALF THE ROOF TO ANOTHER DRAINAGE AREA. FOR THIS MODEL, THE UNITS HAVE BEEN MODELED AS FOLLOWS:

DRAINAGE AREA-1 WILL RECEIVE ALL THE ROOF RUNOFF FROM UNITS 13, 14 AND 15 AND RECEIVE HALF THE ROOF RUNOFF FROM UNITS 10, 11 AND 12 FOR A TOTAL OF 4.5 UNITS.

DRAINAGE AREA-2 WILL RECEIVE ALL THE ROOF RUNOFF FROM UNITS 6, 7, 8 AND 9 AND RECEIVE HALF THE ROOF RUNOFF FROM UNITS 3, 4, 5, 10, 11, AND 12 FOR A TOTAL OF 7 UNITS.

DRAINAGE AREA-3 WILL RECEIVE ALL THE ROOF RUNOFF FROM UNITS 1 AND 2 AND RECEIVE HALF THE ROOF RUNOFF FROM UNITS 3, 4, 5, 16, 17, 18 AND 19 FOR A TOTAL OF 5.5 UNITS.

DRAINAGE AREA-4 WILL RECEIVE HALF THE ROOF RUNOFF FROM UNITS 16, 17, 18 AND 19 FOR A TOTAL OF 2 UNITS.

THE STORMWATER FLOW FROM DRAINAGE AREA-1 WILL DISCHARGE DIRECTLY TO THE EXISTING WETLAND AREA. THE STORMWATER FLOW FROM DRAINAGE AREAS-2 AND 3 WILL DISCHARGE TO THE GRASSED SWALES WHICH DISCHARGE TO THE INFILTRATION/DETENTION POND. THE STORMWATER FLOW FROM DRAINAGE AREA-4 WILL DISCHARGE DIRECTLY TO THE INFILTRATION/DETENTION POND.

OWNER:
SHELEEN CLARKE
96 DUCK COVE ROAD
NORTH KINGSTOWN, RI 02852

APPLICANT:
NEW ENGLAND PROPERTIES, LLC
257 WICKFORD CT.
NORTH KINGSTOWN, RI 02852

NOTES:
1. WETLAND FLAGS DELINEATED BY AVIZINIS ENVIRONMENTAL SERVICES, INC. 2022.
2. OFF SITE BUILDING LOCATIONS ARE APPROXIMATE AND HAVE BEEN TAKEN FROM AERIAL PHOTOGRAPHY.
3. ELEVATIONS BASED ON NAVD88 VERTICAL DATUM.
4. A SMALL PORTION OF SUBJECT SITE IS SITUATED IN FEMA 100-YR FLOOD ZONE 'A' AS DEPICTED ON MAP 44009C0201J, EFFECTIVE 4/3/2020. THE REMAINING PORTION OF THE SITE IS SITUATED IN ZONE 'X' WHICH IS AREA OF MINIMAL FLOOD HAZARD.

LAND UNSUITABLE FOR DEVELOPMENT:

WETLANDS	1.17 AC.
COASTAL WETLANDS	0.00 AC.
HIGH FLOOD DANGER ZONE	0.45 AC.
EASEMENTS (ABOVE GRND. UTILITY)	0.00 AC.

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

PROPOSED CONDITIONS STORMWATER PLAN

SCALE: 1" = 60'

LEGEND

ABUTTER LINE	BUILDING SETBACK LINE
LOT LINE	EXISTING CONTOUR
EDGE OF ROAD PAVEMENT	EXISTING SPOT GRADE
ROADWAY CENTERLINE	PROPOSED LOT CONTOUR
ROADWAY STATION	PROPOSED SPOT GRADE
TEST HOLE	DRAINAGE MANHOLE
PERC TEST	HYDRANT
LEDGE TEST	DRAIN LINE
UTILITY POLE	WATERLINE
WETLAND EDGE	OVERHEAD WIRES
200' RIVER BUFFER ZONE	UNDERGROUND ELECTRIC/TELE.
20' STRUCTURE SETBACK	SOIL BOUNDARY LINE
EXISTING STONEWALL	FEMA 100-YR FLOOD ZONE
UNDERGROUND TELE/COMM	CURB STOP
	WATER VALVE
	PROPOSED STONE WALL

TIMOTHY J. BEHAN
No. 6278
REGISTERED PROFESSIONAL ENGINEER
10/21/2024

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RHODE ISLAND 02908
(401) 273-6600

REVISIONS

No.	DATE	DRWN	CHKD
1	4/2/24	TB	TB
2	4/18/24	TB	TB
3	9/6/24	SMA	TB
4	9/30/24	SMA	TB
5	10/21/24	SMA	TB

PERMIT AGENCY REVIEW PLAN
FOR
VILLAGE AT BROAD ROCK
PLAT 33, LOT 24
ON
BROAD ROCK ROAD
SOUTH KINGSTOWN, RHODE ISLAND

PROPOSED WATERSHED MAP

SCALE: AS SHOWN	SHEET NO: 2 OF 2
DRAWN BY: SMA / DESIGN BY: SMA	CHECKED BY: TJB
DATE: AUGUST 2024	PROJECT NO 23011.00

APPENDIX-3

USDA SOILS MAP

Custom Soil Resource Report
Soil Map

Map Scale: 1:2,990 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

APPENDIX-4

STORMWATER WORK SHEETS

COMMONWEALTH Engineers & Consultants, Inc.
►400 Smith Street
Providence, RI 02908
►Tele. 401·273·6600
Fax: 401·273·6674

VILLAGE AT BROAD ROCK 9/4/2024
A.P. 33, LOT 24
BROAD ROCK ROAD
SOUTH KINGSTOWN, RI

MINIMUM STANDARD 2 GROUNDWATER RECHARGE (Rev)

Rev= (1") (F) (I)/12

Rev= GROUNDWATER RECHARGE VOLUME (AC-FT)
F= RECHARGE FACTOR
I = IMPERVIOUS AREA IN ACRES

TOTAL PROPOSED IMPERVIUOS AREA=	76521	SF
	1.757	ACRES
PROPOSED IMPERVIOUS AREA-B SOILS	76521	S.F
	1.757	ACRES

I = HSG TYPE D = 0.35

Rev =	0.051	AC-FT
	2232	CF
TOTAL INFILTRATION REQUIRED=	2232	CF
INFILTRATION PROVIDED=	6534	CF

VOLUME INFILTRATED GREATER THAN VOLUME REQUIRED (6534>2232), SO OKAY

VILLAGE AT BROAD ROCK 9/4/2024
A.P. 33, LOT 24
BROAD ROCK ROAD
SOUTH KINGSTOWN, RI

MINIMUM STANDARD 3: WATER QUALITY VOLUME (WQv)

WQv= (1") (I)/12

WQv= WATER QUALITY VOLUME (AC-FT)
I = IMPERVIOUS AREA IN ACRES

PROPOSED ASPHALT/ROOFS IMPERVIOUS AREA	76521	S.F
	1.757	ACRES
WQv =	0.146	AC-FT
	6377	CF

VOLUME REQUIRED	6377	CF
INFILTRATION VOLUME PROVIDED	6534	CF

VOLUME INFILTRATED GREATER THAN VOLUME REQUIRED (6534>6377), SO OKAY

COMMONWEALTH Engineers & Consultants, Inc.
►400 Smith Street
Providence, RI 02908
►Tele. 401·273·6600
Fax: 401·273·6674

VILLAGE AT BROAD ROCK 9/4/2024
A.P. 33, LOT 24
BROAD ROCK ROAD
SOUTH KINGSTOWN, RI

MINIMUM STANDARD 4: CHANNEL PROTECTION VOLUME (CPv)
COLD WATER FISHERY: NO
CPv= Vs= (0.65) (Vr)

CPv=Vs= CHANNEL PROTECTION VOLUME (AC-FT)
Vr = RUNOFF VOLUME FROM 1-YEAR, TYPE III STORM (AC-FT)

RUNOFF FROM 1-YEAR
TYPE III STORM (Vr) 0.727 (AC-FT)

CPv = 0.473 AC-FT
20584 CF

INFILTRATION PROVIDED= 26441 CF 1-YEAR STORM VOLUME INFILTRATED ON SITE

VOLUME INFILTRATED GREATER THAN VOLUME REQUIRED (26,441>20,584), SO OKAY

MINIMUM STANDARD 5 : OVERBANK FLOOD PROTECTION
EVALUATED FOR TOTAL SITE
STORMWATER POST-DEVELOPMENT FLOW RATES (C.F.S.)

	10-YEAR			100-YEAR		
	Q_{10X}	Q_{10P}	Δ	Q_{100X}	Q_{100P}	Δ
	11.17	8.20	-2.97	38.28	26.01	-12.27
10-YEAR MITIGATION REQUIRED:				NO		
100-YEAR MITIGATION REQUIRED:				NO		

VILLAGE AT BROAD ROCK
A.P. 33, LOT 24
BROAD ROCK ROAD
SOUTH KINGSTOWN, RI

9/4/2024
Revised 10/24/2024

PRE-POST STORMWATER SUMMARY TABLE						
	1-YEAR PEAK DISCHARGE	1-YEAR PEAK VOLUME	10-YEAR PEAK DISCHARGE	10-YEAR PEAK VOLUME	100-YEAR PEAK DISCHARGE	100-YEAR PEAK VOLUME
	(CFS)	(ACRE-FEET)	(CFS)	(ACRE-FEET)	(CFS)	(ACRE-FEET)
PRE-DEVELOPMENT CONDITIONS	1.25	0.341	11.17	1.688	38.28	5.151
POST-DEVELOPMENT CONDITIONS	1.17	0.251	8.13	1.036	25.87	3.825
REDUCTION	0.08	0.090	3.04	0.652	12.41	1.326

APPENDIX-5

TEST PIT LOGS

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 1A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0 – 8	A	S	10YR 4/3	-	-	SL	1 F GR	VFR	3
Bw	8 – 36	A	W	10YR 5/4	-	-	FSL	1 F SBK	FR	4
2Cd	36 – 120+	C	W	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 1B 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 4/3	-	-	SL	1 F GR	VFR	3
Bw	10 – 40	G	W	-	-	-	FSL	1 F SBK	FR	4
C	40 - 65	A	W	2.5Y 5/2	7.5YR 5/6	F, 2, P	VFSL	0 MA	FR	7
2Cd	65 – 120+	-	-	2.5Y 4/3	-	-	GR, ST S	0 MA	FI	8M

TH 1A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 1B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site:

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
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Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 2A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0 – 8	A	S	10YR 4/3	-	-	SL	1 F GR	VFR	3
Bw	8 – 38	A	W	10YR 5/4	2.5Y 6/2	@ 36 F, 3, P	FSL	1 F SBK	FR	4
2Cd	38 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 2B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0 – 8	A	S	10YR 4/3	-	-	SL	1 F GR	VFR	3
Bw	8 – 41	A	W	10YR 5/4	2.5Y 6/3 7.5YR 5/6	@36 C, 3, P @36 C, 4, P	FSL	1 F SBK	FR	4
2Cd	41 – 120+	-	-	2.5Y 4/3	-	-	GR, ST S	0 MA	FI	8M

TH 2A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 2B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%

2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch.	NO ☒	YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above.	NO ☒	YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42?	NO ☒	YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch.	NO ☒	YES ☐

8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site:

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 3A 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 4/3	-	-	SL	1 M GR	VFR	3
Bw	15 – 42	G	W	10YR 5/4	2.5Y 6/2	@36 C, 3, P	VFSL	1 F SBK	FR	5
C	42 – 52	C	W	2.5Y 6/2	7.5YR 5/6	C, 3, P	SIL	0 MA	FR	7
2Cd	52 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 3B 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 4/3	-	-	SL	1 F GR	VFR	3
Bw	12 – 46	A	W	10YR 5/4	2.5Y 6/3	@36 C, 3, P	VFSL	1 F SBK	FR	5
C	46 – 96+	-	-	2.5Y 4/3	-	-	GR, ST S	0 MA	FI	8M

TH 3A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 3B Soil Class G/B Total Depth 96 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 84 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site:

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 4A 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	9 – 48	A	W	10YR 5/4	-	-	VFSL	1 M SBK	FR	5
2Cd	48 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 4B 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	2.5Y 2.5/1	-	-	SL	2 F GR	VFR	3
Bw	16 – 42	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	42 – 72	A	W	2.5Y 6/2	-	-	SIL	0 MA	FR	5
2Cd	72 – 114+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 4A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 4B Soil Class G/B Total Depth 114 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

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_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 5A 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	12 – 37	A	W	10YR 5/4	-	-	VFSL	1 M SBK	FR	5
2Cd	37 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 5B 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 4/3	-	-	SL	2 M GR	VFR	3
Bw	13 – 45	A	W	10YR 5/4	-	-	SIL	1 M SBK	FR	5
2Cd	45 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 5A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 5B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%

2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch.	NO ☒	YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above.	NO ☒	YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42?	NO ☒	YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch.	NO ☒	YES ☐

8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

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_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 6A 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 4/3	-	-	SL	1 M GR	VFR	3
Bw	10 – 36	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2Cd	36 – 108+	-	-	2.5Y 5/3	7.5YR 5/6	Ring @50-52	GRS	0 MA	FI	8M

TH 6B 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	15 – 40	A	W	10YR 5/4	7.5YR 5/6	Ring @38-40	VFSL	1 M SBK	FR	5
2Cd	40 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 6A Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 84 (og)

TH 6B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%

2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch.	NO ☒	YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above.	NO ☒	YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42?	NO ☒	YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch.	NO ☒	YES ☐

8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

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_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 7A 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	10 – 45	A	W	10YR 5/4	-	-	VFSL	1 M SBK	FR	5
2Cd	45 – 120+	-	-	2.5Y 5/3	-	-	GRLS	0 MA	FI	8M

TH 7B 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	13 – 42	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	42 – 62	A	W	2.5Y 6/2	7.5YR 5/6	F, 3, P	SIL	0 MA	FR	7
2Cd	62 – 120+	-	-	2.5Y 5/2	-	-	GRS	0 MA	FI	8M

TH 7A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 7B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%

2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch.	NO ☒	YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above.	NO ☒	YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42?	NO ☒	YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch.	NO ☒	YES ☐

8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

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_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 8A 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	12 – 42	A	W	10YR 5/4	7.5YR 5/6	@20 C, 2, P	VFSL	1 M SBK	FR	5
2Cd	42 – 108+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 8B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A	0 – 4	A	S	2.5YR 2.5/1	-	-	FSL	2 M GR	FR	4
Bw	4 – 53	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2Cd	53 – 108+	-	-	2.5Y 5/2	-	-	GRS	0 MA	FI	8M

TH 8A Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 8B Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 9A 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 4/3	-	-	SL	1 F GR	VFR	3
Bw	15 – 49	A	W	10YR 5/4	2.5Y 6/2 7.5YR 5/6	@30 C, 4, P @30 C, 4, P	LVFS	1 M SBK	FR	5
2Cd	49 – 108+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 9B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 11	A	S	2.5YR 2.5/1	-	-	SL	2 M GR	VFR	3
Bw	11 – 36	A	W	10YR 5/4	2.5Y 6/3 7.5YR 5/6	@31 F, 2, D @31 F, 3, P	VFSL	1 M SBK	FR	5
2Cd	36 – 120+	-	-	2.5Y 5/3	-	-	GR, ST S	0 MA	FI	8M

TH 9A Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 9B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%

2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch.	NO ☒	YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above.	NO ☒	YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch.	NO ☐	YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42?	NO ☒	YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch.	NO ☒	YES ☐

8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 10A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 10	A	S	2.5YR 2.5/1	-	-	SL	2 M GR	VFR	3
Bw	10 – 42	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	42 – 66	A	W	2.5Y 6/1	7.5YR 5/6	@45 C, 3, P	SIL	0 MA	FR	7
2Cd	66 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 10B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 12	A	S	2.5YR 2.5/1	-	-	SL	2 M GR	VFR	3
Bw	12 – 46	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	46 – 57	A	W	2.5Y 6/1	7.5YR 5/6	Ring @55-57	SIL	0 MA	FR	7
2Cd	57 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 10A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 10B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 11A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
Ap	0 – 8	A	S	10YR 4/3	-	-	SL	1 M GR	VFR	3
Bw	8 – 39	A	W	10YR 5/4	7.5YR 5/6	@32 C, 4, P	VFSL	1 C SBK	FR	5
2Cd	39 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 11B 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 4/3	-	-	SL	1 M GR	VFR	3
Bw	12 – 46	G	W	10YR 5/4	-	-	FSL	1 C SBK	FR	5
C	46 – 60	A	W	2.5Y 6/1	7.5YR 5/6	C, 3, P	SIL	0 MA	FR	7
2Cd	60 – 108+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 11A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 11B Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 12A 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 4/3	-	-	FSL	1 M GR	VFR	4
Bw	10 – 44	A	W	10YR 5/4	7.5YR 5/6	@32 C, 3, P @40 M, 4, P	VFSL	1 C SBK	FR	5
2Cd	44 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M
TH 12B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 9	A	S	2.5Y 2.5/1	-	-	SL	1 M GR	VFR	3
Bw	9 – 42	G	W	10YR 5/4	-	-	FSL	1 C SBK	FR	5
C	42 – 55	A	W	2.5Y 6/1	7.5YR 5/6	C, 3, P	SIL	0 MA	FR	7
2Cd	55 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 12A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 12B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 13A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 8	A	S	2.5Y 2.5/1	-	-	SL	1 M GR	VFR	3
Bw	8 – 33	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2Cd	33 – 108+	-	-	2.5Y 5/3	7.5YR 5/6	@39 F, 3, P	GRS	0 MA	FI	8M
TH 13B Horizon	**Depth**	**Horizon Boundaries**		**Soil Colors**		**Re-Dox**	**Texture**	**Structure**	**Consistence**	**Soil Category**
		Dist	**Topo**	**Matrix**	**Re-Dox Features**	**Ab. S. Contr.**				
A/Ap	0 – 9	A	S	2.5Y 2.5/1	-	-	FSL	1 M GR	VFR	4
Bw	9 – 43	A	W	10YR 5/4	-	-	FSL	1 C SBK	FR	4
2Cd	43 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 13A Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 13B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

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Part A prepared by: _____ License #D4098
Signature

Part B prepared by: _____ License # D4098
Signature

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____
Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 14A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 9	A	S	2.5Y 2.5/1	-	-	SL	2 C GR	VFR	3
Bw	9 – 44	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2C	44 – 64	A	W	2.5Y 6/3	-	-	S	0 MA	FR	6
2Cd	64 – 108+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 14B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 10	A	S	2.5Y 2.5/1	-	-	FSL	2 F GR	VFR	4
Bw	10 – 40	G	W	10YR 5/3	-	-	FSL	1 M SBK	FR	4
2C	40 – 68	A	W	2.5Y 5/3	-	-	S	0 MA	FR	6
2Cd	64 – 114+	-	-	2.5Y 5/2	-	-	GRS	0 MA	FI	8M

TH 14A Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 14B Soil Class G/B Total Depth 114 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 7, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 15A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A	0 – 6	A	S	10YR 4/3	-	-	SL	2 C GR	VFR	3
Bw	6 – 34	G	W	10YR 4/4	-	-	FSL	1 F SBK	FR	4
C	34 – 68	A	W	2.5Y 6/3	7.5YR 5/6	C, 2, P	VFSL	0 MA	FR	6M
2Cd	68 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 15B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 9	A	S	2.5Y 2.5/1	-	-	SL	2 F GR	VFR	3
Bw	9 – 40	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	40 – 68	A	W	2.5Y 5/3	7.5YR 5/6	C, 2, P	VFSL	0 MA	FR	6M
2Cd	68 – 114+	-	-	2.5Y 5/2	-	-	GRS	0 MA	FI	8M

TH 15A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 15B Soil Class G/B Total Depth 114 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 16A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/Ap	0 – 14	A	S	10YR 4/3	-	-	FSL	2 M GR	FR	4
Bw	14 – 44	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	44 – 60	-	-	2.5Y 6/2	7.5YR 5/6	C, 2, P	SIL	0 MA	FR	7
2Cd	60 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 16B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/E	0 – 4	A	S	2.5YR 2.5/1	-	-	FSL	2 C GR	FR	4
Bw	4 – 42	G	W	7.5YR 4/4	-	-	VFSL	1 M SBK	FR	5
C	42 – 64	A	W	2.5Y 6/2	-	-	SIL	0 MA	FR	7
2Cd	64 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 16A Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 16B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 17A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/E	0 – 4	A	S	2.5YR 2.5/1	-	-	FSL	2 C GR	FR	4
Bw	4 – 51	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2Cd	51 – 132+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 17B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/E	0 – 4	A	S	2.5YR 2.5/1	-	-	FSL	2 C GR	FR	4
Bw	4 – 45	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2Cd	45 – 132+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 17A Soil Class G/B Total Depth 132 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 17B Soil Class G/B Total Depth 132 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 18A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/E	0 – 12	A	S	10YR 4/3	-	-	SL	1 M GR	FR	3
Bw	12 – 47	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
2Cd	47 – 132+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 18B Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/E	0 – 12	A	S	10YR 4/3	-	-	SL	1 M GR	FR	3
Bw	12 – 45	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	5
C	45 – 65	-	-	2.5Y 6/2	-	-	SIL	0 MA	FR	7
2Cd	65 – 132+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 18A Soil Class G/B Total Depth 132 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 18B Soil Class G/B Total Depth 132 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder. 18B had many boulders.

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 2332-0114

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

TH 19A Horizon	Depth	Horizon Boundaries		Soil Colors		Re-Dox	Texture	Structure	Consistence	Soil Category
		Dist	Topo	Matrix	Re-Dox Features	Ab. S. Contr.				
A/E	0 – 4	A	S	2.5Y 2.5/1	-	-	SL	1 M GR	FR	3
Bw	4 – 29	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	29 – 55	-	-	2.5Y 6/2	7.5YR 5/6	C, 2, P	VFSL	0 MA	FR	7
2Cd	55 – 144+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 19B 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 4/3	-	-	SL	1 M GR	FR	3
Bw	10 – 32	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	5
C	32 – 64	A	W	2.5Y 6/2	7.5YR 5/6	C, 2, P	VFSL	0 MA	FR	7
2Cd	64 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH 19A Soil Class G/B Total Depth 144 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH 19B Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

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Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

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 drainage only

Property Owner: Sheleen M. Clarke
Property Location: 852 Broad Rock Road (A.P. 33, Lot 24), South Kingstown, Rhode Island
Date of Test Hole: May 8, 2024
Soil Evaluator: Amber K. Hardy, M.S. License Number: D4098
Weather: Partly cloudy, 70° F, recent rain Shaded: Yes ☐ No ☒ Time: 8:00 am

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 – 12	A	S	2.5Y 2.5/1	-	-	SL	1 M GR	FR	3
Bw	12 – 42	A	W	10YR 5/4	-	-	FSL	1 M SBK	FR	4
C	42 – 53	-	-	2.5Y 6/2	7.5YR 5/6	C, 2, P	VFSL	0 MA	FR	7
2Cd	53 – 108+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	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 – 11	A	S	10YR 4/3	-	-	SL	1 M GR	FR	3
Bw	10 – 42	G	W	10YR 5/4	-	-	FSL	1 M SBK	FR	5
C	42 – 57	A	W	2.5Y 6/2	7.5YR 5/6	C, 2, P	VFSL	0 MA	FR	7
2Cd	57 – 120+	-	-	2.5Y 5/3	-	-	GRS	0 MA	FI	8M

TH D1 Soil Class G/B Total Depth 108 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

TH D2 Soil Class G/B Total Depth 120 Impervious/Limiting Layer Depth none obs (og) GW Seepage Depth none obs SHWT 96 (og)

Comments: Occasional boulder

Part B

Site Evaluation – to be completed by Soil Evaluator or Class II or III Designer

Please use the area below to locate:

1. Test holes and bedrock test holes,
2. Approximate direction of due north,
3. Offsets from all test holes to fixed points such as street, utility pole, or other permanent, marked object.*
   *OFFSETS MUST BE SHOWN

Key:
- Approximate location of test holes
- Approximate location of bedrock test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Bedrock THs	
TH	Depth

1. Relief and Slope: 3 - 8%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes? If yes, locate on above sketch. NO ☒ YES ☐
3. Restrictive Layer or Bedrock within 4' below original ground within 25 feet of test hole? Provide all test hole locations & depths above. NO ☒ YES ☐
4. Presence of existing or proposed private drinking water wells within 200 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
5. Public drinking water wells within 500 feet of test holes? If yes, locate on above sketch. NO ☐ YES ☐
6. Is site within the watershed of a public drinking water reservoir or other critical area defined in Rule 6.42? NO ☒ YES ☐
7. Has soil been excavated from or fill deposited on site? If yes, locate on above sketch. NO ☒ YES ☐
8. Site's potential for flooding or ponding: NONE ☒ SLIGHT ☐ MODERATE ☐ SEVERE ☐
9. Landscape position: Backslope
10. Vegetation: About 50% mixed deciduous woodland and 50% house yard area, one area of orchard trees
11. Indicate approximate location of property lines and roadways.
12. Additional comments, site constraints or additional information regarding site: One area near the apple orchard appears cut and filled, but no HTM was seen in test holes

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature License #D4098

Part B prepared by: _____ Signature License # D4098

DO NOT WRITE IN THIS SPACE

Witnessed Soil Evaluation Decision: Concur ☐ Inconclusive ☐ Disclaim ☐

Unwitnessed Soil Evaluations Decision: Accept ☐ Inconclusive ☐ Disclaim ☐

Wet Season Determination required ☐ Additional Field Review Required ☐

Explanation: _____

_____

_____

_____ _____

Signature Authorized Agent Date

AVIZINIS
ENVIRONMENTAL
SERVICES INC

2023 AERIAL MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

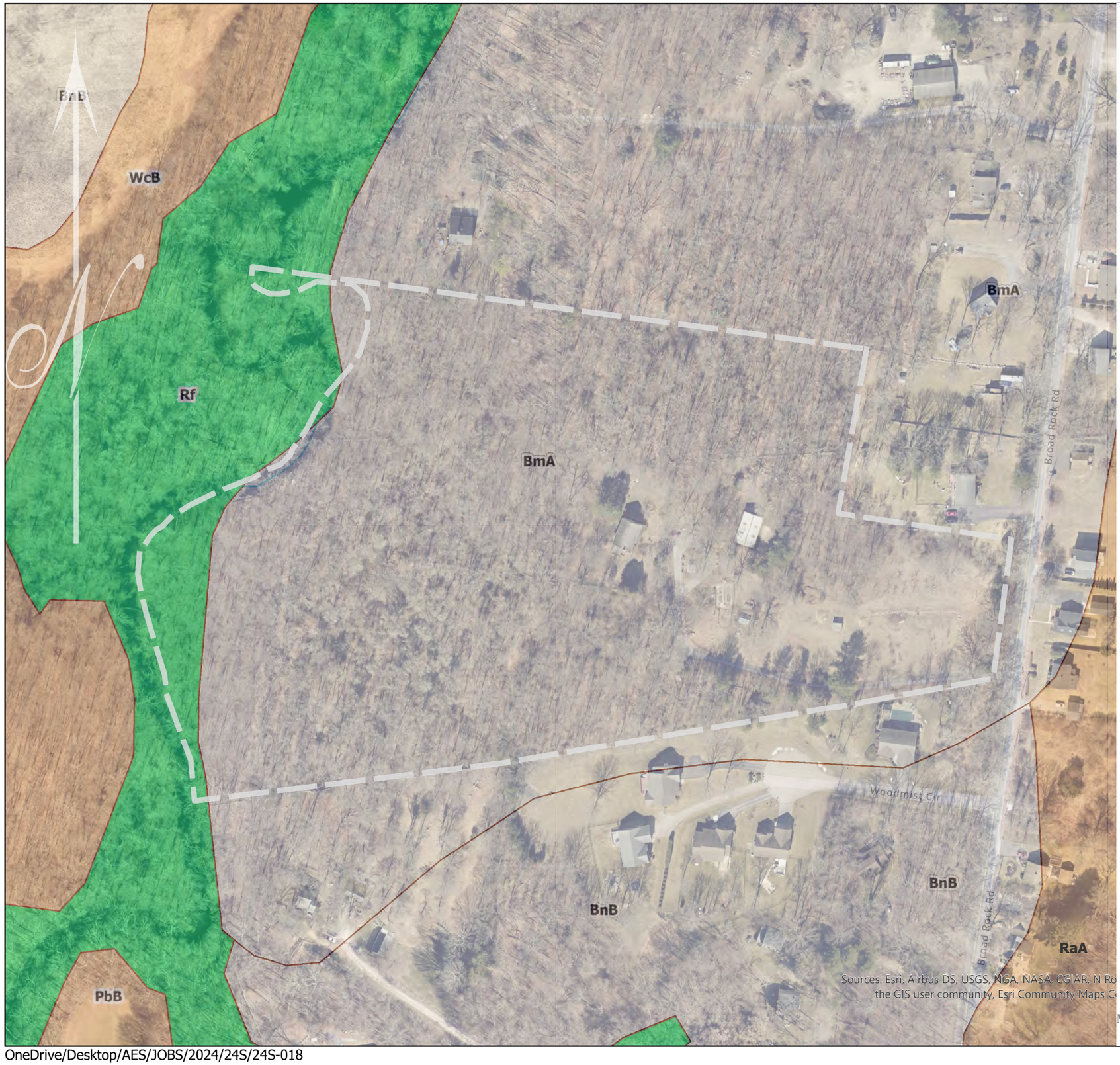
Property Line

150 75 0 150 300 450
Feet

General Notes:
1. This map should not be interpreted as a survey quality graphic. It is designed for preliminary planning purposes only. AES recommends consultation with a Professional Land Surveyor for accurate site feature locations.
2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.

Map created by: Patrick J. Loveland, GIS Specialist 03/04/2024

OneDrive/Desktop/AES/JOBS/2024/24S/24S-018



AVIZINIS
ENVIRONMENTAL
SERVICES INC

USDA - NRCS SOIL SURVEY MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

BmA - Bridgehampton silt loam, till substratum, 0 to 3 percent slopes
BnB - Bridgehampton-Charlton complex, very stony, 0 to 8 percent slopes
RaA - Rainbow silt loam, 0 to 3 percent slopes
Rf - Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony
WcB - Wapping very stony silt loam, 0 to 8 percent slopes

150 75 0 150 300 450
Feet

General Notes:
1. This map should not be interpreted as a survey quality graphic. It is designed for preliminary planning purposes only. AES recommends consultation with a Professional Land Surveyor for accurate site feature locations.
2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.

Map created by: Patrick J. Loveland, GIS Specialist 03/04/2024

AVIZINIS
ENVIRONMENTAL
SERVICES INC

USGS TOPOGRAPHIC MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

Property Line

500 250 0 500 1,000 1,500
Feet

General Notes:
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3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.

Map created by: Patrick J. Loveland, GIS Specialist 03/04/2024

OneDrive/Desktop/AES/JOBS/2024/24S/24S-018

AVIZINIS
ENVIRONMENTAL
SERVICES INC

2024 SOIL EVALUATION MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

- Property Line
- Soil Evaluation
- Wetland Feature
- River

150 75 0 150 300
Feet

General Notes:
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2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.
4. Soil test holes located with a Juniper Geode Submetric GNSS receiver with SWmaps data collection software.

Delineation performed by:
Amber K. Hardy, M.S., Soil Evaluator D4098 05/08/2024

Map created by:
Patrick J. Loveland, GIS Specialist 05/20/2024

OneDrive/Desktop/AES/JOBS/2024/24S/24S-018

APPENDIX-6

WETLAND REPORT BY AVIZINIS ENVIRONMENTAL SERVICES, INC.

AND RIDEM WETLAND EDGE VERIFICATION LETTER

APPLICATION NO. 24-0115

AVIZINIS
ENVIRONMENTAL
SERVICES INC

WETLAND REPORT

SITE LOCATION:
A.P. 33, Lot 24
852 Broad Rock Road
South Kingstown, Rhode Island

PREPARED FOR:
Curt Nunes, PLS
Commonwealth Land Surveyors
cnunes@commonwealthlandsurveyors.com

PREPARED (July 15, 2022) BY:

Edward J. Avizinis, CPSS, PWS | President

INTRODUCTION

Avizinis Environmental Services, Inc., (AES), has completed the requested field work at the identified project site at 852 Broad Rock Road in South Kingstown, Rhode Island. AES staff visited the site on July 14, 2022 to delineate the regulated wetlands that occur along the project site.

Wetlands in Rhode Island are regulated by two agencies, the Department of Environmental Management (DEM), or the Coastal Resources Management Council (CRMC). The State of Rhode Island has created predetermined maps that identify which properties are under which regulatory agency. These maps identify that the subject property is within DEM jurisdiction. Therefore, AES has delineated all onsite wetland features on the lot to meet the standards outlined in Appendix 2 of the Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act (250-RICR-150-15-3, effective July 1).

EXISTING CONDITIONS

The is located extending west from Broad Rock Road to the banks of the Saugatucket River in a residential section of South Kingstown, Rhode Island. The property consists of a residential structure with an associated yard, driveway, and other ancillary structures. The Saugatucket River is categorized as a warm-water fishery by the DEM and runs along the western edge of the property. The length of the Saugatucket River running through this region has been designated as a wildlife corridor and High Value / High Vulnerability Habitat by the DEM. All limits of wetland impacting the property have been delineated by AES.

A review of historic aerial photographs available from the DEM – Environmental Resource Maps, shows that as of the earliest available photographs taken in 1939, this property and much of the surrounding area were cleared for agricultural use between Broad Rock Road and the Saugatucket River. By the time of the next available imagery from 1951-1952, much of this cleared land had been left to revegetate. The imagery from 1962 reveals that a portion of the eastern portion of this property had been recleared, but as of the next available imagery from 1972 had been left to revegetate once more. The imagery from 1981 shows that the eastern portion of the property had once again been cleared, and the first structure on the lot had been erected towards the center of the property. As of the time of the

1997 imagery, the second structure present on the lot had been constructed. No additional changes can be seen in the remaining successive images.

WETLAND FEATURES

AES has established one wetland flag series on the property. Flagging labeled **A1 – A30** delineates the closest limit of a swamp surrounding Saugatucket River along the western edge of the property and extending well off the lot, following the course of the river off to the north and south.

REGULATORY SETBACKS

In accordance with wetland regulations (250-RICR-150-15-3), all freshwater wetlands will require a 100-foot Jurisdictional Area, and all rivers, streams, and intermittent streams require a 200-foot jurisdictional area. Any proposed alterations with this zone will require some degree of application and review by the DEM. This jurisdictional area has not been depicted on the attached maps.

Furthermore, a separate buffer zone and construction setback will be required for the wetland. The buffer zone is a naturally vegetated or planted area left to naturalize that is immediately contiguous with the wetland. The setback is a separate zone that limits the placement of structures.

The size of the buffer zone is based on numerous factors including wetland vegetative type, subtype, position within the watershed, and habitat types among other factors. The project area lies within River Protection Region 2. The wetland feature delineated by the A-series is a deciduous-dominated swamp that is greater than 10 acres in size and is not within a drinking water supply watershed. This wetland will therefore receive a 75-foot buffer zone per section 2.23.H.3.e. In accordance with 2.23.H.5., Saugatucket River shall require the application of a 200-foot buffer zone.

In addition, a 20-foot construction setback shall be applied to the landward limit of the farthest-reaching buffer zone. Certain construction activities are limited within the setback related to primary structures. Only a 5-foot construction setback pertains to accessory structures (section 2.71.C.1.). It is unclear in the regulations whether or not stormwater

features are subject to the setback requirements, nor are they listed under the definition for accessory structures.

Flag Series	Classification	Jurisdictional Area (ft)	Buffer Zone (ft)	Setback (ft)
A1 – A30	Swamp	100	75	20
Not flagged	River (Saugatucket River)	200	200	20

CLOSING

Thank you for giving AES the opportunity to assist you with this project. Please review the attached wetland delineation map which represents the finding of my field work. I have located the wetland flags and other pertinent site features with a Spectra SP20 submetric GPS/GNSS. Although this is not survey quality it is useful for preliminary planning. This data has also been forwarded to you in conjunction with this report and is in the NAD 1983 RI State Plane format in case this information is useful to you. Please do not hesitate to contact AES should you have any questions on this report.

ATTACHMENTS

1) 2021 AERIAL MAP
2) USDA – NRCS SOIL SURVEY MAP
3) USGS TOPOGRAPHIC MAP
4) WETLAND DELINEATION MAP

AVIZINIS
ENVIRONMENTAL
SERVICES INC

2021 AERIAL MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

Property Line

150 75 0 150 300 450
Feet

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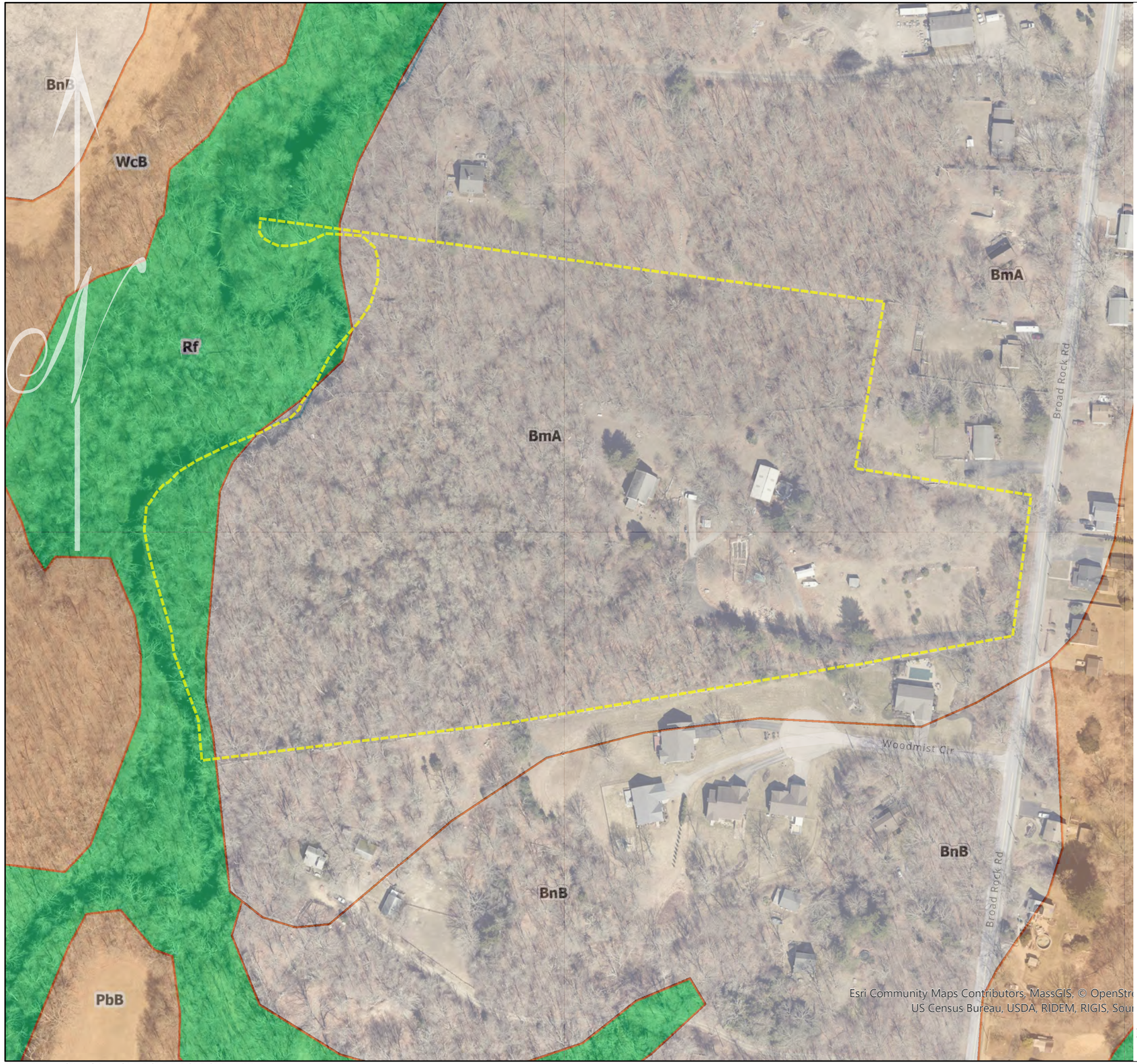
2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.

Map created by: Patrick J. Loveland, GIS Specialist 07/07/2022

OneDrive/Desktop/AES/JOBS/22/22-163



AVIZINIS
ENVIRONMENTAL
SERVICES INC

USDA - NRCS SOIL SURVEY MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

BmA - Bridgehampton silt loam, till substratum, 0 to 3 percent slopes
BnB - Bridgehampton-Charlton complex, very stony, 0 to 8 percent slopes
PbB - Paxton very stony fine sandy loam, 0 to 8 percent slopes
Rf - Ridgebury, Whitman, and Leicester extremely stony fine sandy loams
WcB - Wapping very stony silt loam, 0 to 8 percent slopes

150 75 0 150 300 450
Feet

General Notes:
1. This map should not be interpreted as a survey quality graphic. It is designed for preliminary planning purposes only. AES recommends consultation with a Professional Land Surveyor for accurate site feature locations.
2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.

Map created by: Patrick J. Loveland, GIS Specialist 07/07/2022

OneDrive/Desktop/AES/JOBS/22/22-163

AVIZINIS
ENVIRONMENTAL
SERVICES INC

USGS TOPOGRAPHIC MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

Property Line

400 200 0 400 800 1,200
Feet

General Notes:
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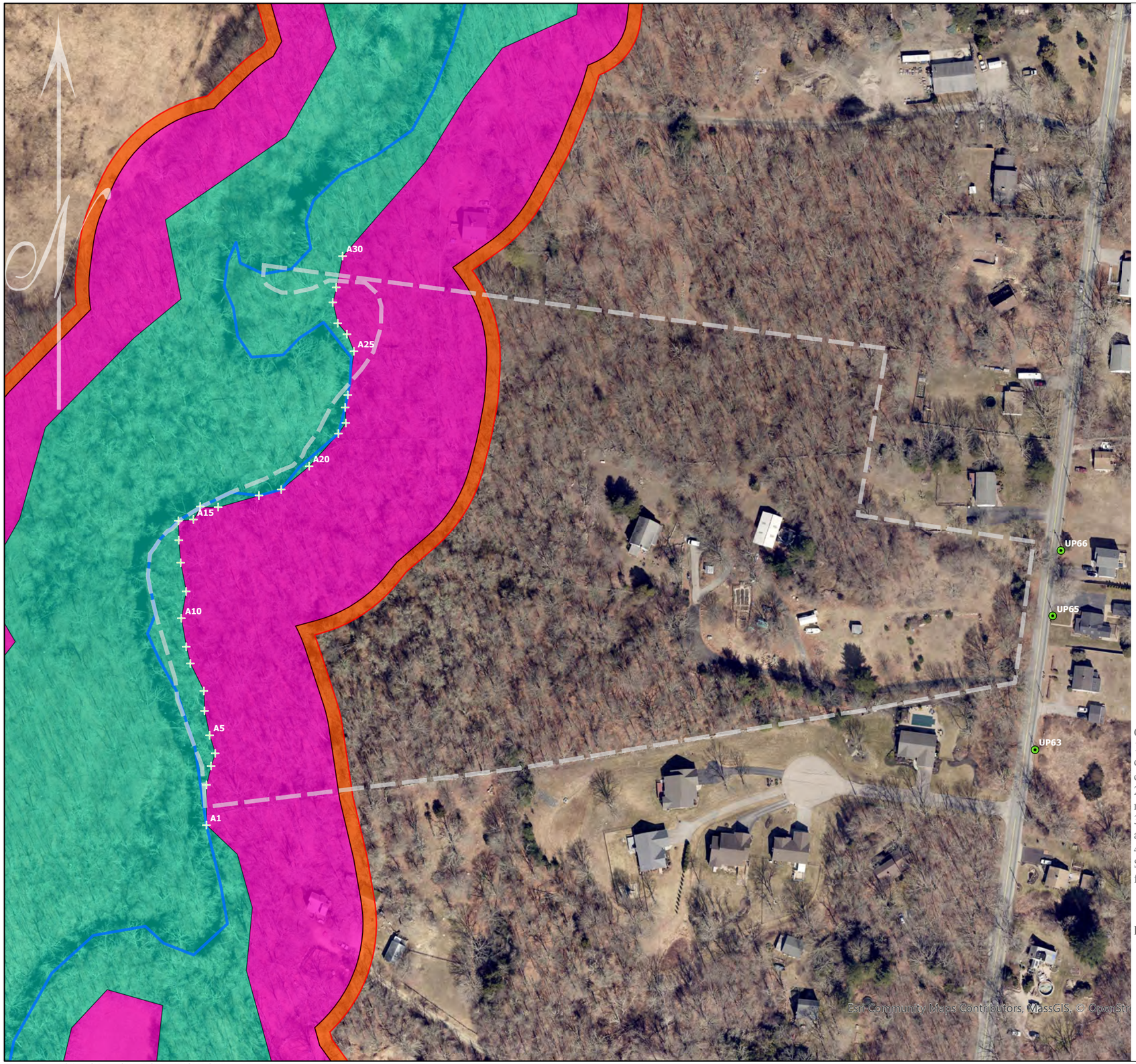
2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.

Map created by: Patrick J. Loveland, GIS Specialist 07/07/2022

OneDrive/Desktop/AES/JOBS/22/22-163



AVIZINIS
ENVIRONMENTAL
SERVICES INC

2022 WETLAND DELINEATION MAP
A.P. 33, Lot 24 | 852 Broad Rock Road
South Kingstown, Rhode Island

LEGEND

- Property Line
- GPS Benchmark Location
- AES Wetland Flag
- Wetland Feature
- Buffer Zone
- Construction Setback
- River

150 75 0 150 300
Feet

General Notes:
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2. Property lines as depicted on this map have been approximated from plat maps available from the town assessor's online database.
3. Aerial photograph base map and other data layers acquired from the RI DEM and RIGIS database.
4. Site features located with a Juniper Geode Submetric GNSS receiver with SWmaps data collection software. Non-delineated wetland edges have not been field verified and are depicted for graphic purposes only.

Delineation performed by:
Edward J. Avizinis, CPSS, PWS **07/14/2022**

Map created by:
Patrick J. Loveland, GIS Specialist **07/15/2022**

OneDrive/Desktop/AES/JOBS/22/22-163

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 Promenade Street
Providence, Rhode Island 02908

August 22, 2024

Sheleen M. Clark Revocable Living Trust
c/o Steven Clark
257 Wickford Court
North Kingstown, RI 02852

RE: Application No. 24-0115 in reference to the location below:

Approximately 600 feet west of Broad Rock Road (at House No.852), opposite Utility Pole No.65, and approximately 280 feet north of its intersection with Woodmist Circle, Assessor's Plat 33, Lot 24, South Kingstown, RI.

Dear Mr. Clark,

Kindly be advised that the Department of Environmental Management's ("DEM") Freshwater Wetlands Program ("Program") has completed its review of your Request to verify freshwater wetland edges. This review included an inspection of the above referenced property ("subject property") as described by the site plans submitted with your application and received on May 14, 2024.

Per Rule 250-RICR-150-15-3.23, the **Statewide Buffer Zone Designation, your property falls within:**

- River Protection Region 2.

Based upon the Program's observations and review, it is our determination that freshwater wetlands are present on or are in close proximity to the subject property. These freshwater wetlands and other jurisdictional areas are regulated by this Department and include, but are not limited to, at least the following types:

Jurisdictional Areas:

- Freshwater Wetlands (see below)
- Buffer: All areas of undeveloped vegetated land adjacent to a freshwater wetland that is to be retained in its natural undisturbed condition or is to be created to resemble a naturally occurring vegetated area. For the purpose of defining buffer in these Rules, "adjacent to" means land area within the buffer zone.
- Floodplain.
- Contiguous areas that extend outward two-hundred feet (200') from the edge of a river.
- Contiguous areas that extend one-hundred feet (100') from the edge of all other freshwater wetlands.

Freshwater Wetlands and associated Statewide Buffer Zone Designation include at least the following types:

- Deciduous forested swamp greater than 10 acres = 75-foot Buffer zone plus 25 feet due to the Saugatucket River within 50 feet of the swamp edge resulting in a 100-foot Buffer zone.

- Saugatucket River = 200-foot Buffer zone.

The DEM has completed an inspection and review of the wetland edges delineated by you on-site and referenced as flag numbers A2 – A29. It is our determination that the wetland edges delineated on-site are accurate. The wetland edge has been shown on the site plan submitted with your application and is referenced as Flag Nos. A2 to A29.

Please note that the depicted "FEMA 100 Year Flood 'A'" elevation has not been verified by this Program.

This letter does not constitute an approval or permit for any proposed project on the subject property. Pursuant to R.I. Gen. Laws § 2-1-21(a) of the Freshwater Wetlands Act and the Rules and Regulations Governing the Administration and Enforcement of the Freshwater Wetlands Act, 250-RICR150-15-3, a permit is required from this Program prior to the commencement of any activity which impacts or alters freshwater wetlands.

This Program assumes that the edges of freshwater wetlands, as flagged or marked on site, have been accurately surveyed and portrayed on site plans submitted in support of your application. This Program makes no guarantee or representation that such survey is accurate.

In addition, you should note that freshwater wetlands are present on this property which may be regulated under Section 404 of the Clean Water Act (Federal Water Pollution Control Act, as amended 33 U.S.C. 1344). Accordingly, a permit may be required from the U.S. Army Corps of Engineers for alteration of these wetland areas.

In accordance with 250-RICR-150-15-3.9.3(H), this verification of the delineated edge of freshwater wetlands is valid for a limited period of five (5) years from the date of issue.

Please contact Hunter Trowbridge of this Office by telephone at (401)-537-4363 or email at Edward.trowbridge@dem.ri.gov should you have any questions regarding this letter.

Sincerely,

Andy Charpentier, Environmental Scientist III
Office of Water Resources
Freshwater Wetlands Program
AC/EHT/eht

Ec: Timothy Behan, P.E., Commonwealth Engineers and Consultants
Edward J. Avizinis, Avizinis Environmental Services, Inc.
Curt A. Nunes, PLS, Commonwealth Land Surveyors, Inc.

APPENDIX-7

RECORDED MASTER PLAN APPROVAL DATED JULY 2, 2024

Town of South Kingstown, Rhode Island

PLANNING DEPARTMENT
180 High Street
Wakefield, RI 02879
Tel (401) 789-9331 x1244
Fax (401) 789-9792

July 2, 2024

New England Properties, LLC
c/o Steven M. Clarke
257 Wickford Court
North Kingstown, RI 02852

RE: Village at Broad Rock – Conceptual Master Plan Approval
852 Broad Rock Road
South Kingstown Tax Assessor's Plat 33, Lot 24

Dear Mr. Clarke:

At the meeting of the South Kingstown Planning Board held on June 11, 2024 the Board voted as follows:

"The South Kingstown Planning Board hereby grants conditional Conceptual Master Plan approval for Village at Broad Rock, a nineteen (19) lot major subdivision – flexible residential design project, subject to the conditions stated herein limiting the project to nineteen (19) single-family dwellings, with sixteen (16) units being market-rate housing units and the remaining three (3) units being deed-restricted low- and moderate-income housing units in accordance with the Inclusionary Zoning requirements of the South Kingstown Zoning Ordinance. The project site is located at 852 Broad Rock Road, the applicant is New England Properties, LLC, the owner is the Shellen Clarke Revocable Living Trust AGMT.

This approval is based upon a plan set entitled: *"Flexible Desing Residential Project, Village at Broad Rock for Plat 33, Lot 24, Zoned R-40 in South Kingstown, Rhode Island,"*, containing ten (10) sheets identified as sheets 1 – 7, Yield Plan, Yield Plan with Incentive Lots and Survey Plan as revised through 4/18/2024 and prepared by Timothy J. Behan, Commonwealth Engineers & Consultants, 400 Smith Street, Providence, Rhode Island, 02908. This approval is based on the following Findings of Fact and Conditions of Approval:

Findings of Fact

A. The Planning Board finds that the project application for a nineteen (19) unit subdivision, as proposed by the applicant satisfies the density requirements for a Major Subdivision under the requirements for Inclusionary Zoning within a Flexible Design Residential Project under Sections 502.5 and 502.6 of the South Kingstown Zoning Ordinance.

B. Accordingly, subject to the conditions set forth below, the Planning Board finds that:
   i. The subdivision/flexible design residential project is consistent with the requirements of the Comprehensive Plan.
   ii. The subdivision/flexible design residential project design conforms to the standards and provisions of the South Kingstown Zoning Ordinance.
   iii. No lot is designed and located in such a manner as to require relief from Article 5, Section 504.1 of the Zoning Ordinance, as amended.

iv. There will be no significant negative environmental impacts from the proposed development if the plans are revised consistent with the required conditions of approval.

v. The subdivision/flexible design residential project is consistent with the conditions set forth herein such that it will not result in the creation of individual lots with such physical constraints to development that building on these lots according to pertinent regulations and building standards would be impracticable.

vi. All lots have adequate and permanent physical access to a public street, namely Broad Rock Road, via a private road proposed to be constructed as part of the project.

vii. With the required conditions of approval, the subdivision/flexible design residential project will provide for adequate surface water runoff, for suitable building sites and for the preservation of natural, historical, or cultural features that contribute to the attractiveness of the community.

viii. The design and location of building lots, utilities, drainage improvements, and other improvements in this subdivision/flexible design residential project minimize flooding and soil erosion.

ix. The flexible design plan presented for consideration better promotes the objectives of the Planning Board's Subdivision and Land Development Regulations and Design Manual than would a conventional development after considering all of the criteria set forth at Article III, Section A of the Regulations.

Findings of Fact, Inclusionary Zoning & Affordable Units

x. Pursuant to Article 5, Section 502.6 E. of the Zoning Ordinance, the Planning Board hereby accepts the yield plan presented by the applicant which demonstrates the ability of the development parcel to support a 'basic maximum number' of thirteen (13) lots.

xi. The applicant has affirmatively represented that three (3) lots out of the basic maximum number of thirteen (13) lots will be deed restricted affordable to 'low and/or moderate income households' as defined under Rhode Island General Laws §45-53 and the South Kingstown Zoning Ordinance.

xii. The Planning Board finds that the affordable units are susceptible to being integrated within the development and that the design of the affordable lots can be made consistent with the design of the market rate lots within the development at the Preliminary Plan phase of development. Based on this finding, the Planning Board has determined that the project site is capable of supporting a project design meeting the intent of Article IV.I of the Town's Subdivision and Land Development Regulations.

Findings of Fact, Requested Relief

In accordance with Article VIII, Section B (1) of the Subdivision and Land Development Regulations with regard to waivers, the Planning Board hereby ***grants*** the following waivers:

Section	***Waiver***
Conceptual Master Plan Checklist – Section D.6. Soil evaluations for lots served by OWTS	The requested waiver to defer the requirement for soil evaluations on all lots to Preliminary Plan is granted.

In doing so, the Planning Board finds that:

xiii. The waiver(s) or modification(s) is/are reasonable and within the general purposes and intents of these regulations; and that

xiv. Literal enforcement of the regulations is impracticable and will exact undue hardship because of the peculiar conditions pertaining to the land in question; or waiver or modification of the regulations is in the best interest of good planning practice or design as evidenced by consistency will the Comprehensive Community Plan and the Zoning Ordinance.

Conditions of Approval

1. The use of the property shall be limited to Use Code 10 (single-household detached structure) for residential development as proposed unless further amended by the South Kingstown Planning Board during the Preliminary Plan stage of review.
2. This approval is limited to nineteen (19) building lots in total.
3. This approval is further limited to sixteen (16) market rate units and three (3) affordable units for a total of nineteen (19) units.
4. The subdivision shall satisfy its affordable housing requirement under Section 502.6.D. of the Zoning Ordinance with the dedication of three (3) lots for affordable housing, as defined under Rhode Island General Laws §45-53 and the South Kingstown Zoning Ordinance.
5. Fair Share Development Fees as required in the Zoning Ordinance and as amended annually in the Capital Improvement Program shall be required for all market rate units in this project.
6. All lots to be developed with affordable units shall be eligible for an exemption from the payment of Fair Share Development Fees pursuant to Section 1101.D.1 of the Zoning Ordinance and Section II, Element 5, III of the Town's Capital Improvement Program.
7. All lots to be developed with affordable units shall be exempt from the Town's Pacing and Phasing requirements consistent with Section 502.6.J. of the Zoning Ordinance.
8. All lots designated for affordable housing units shall be deed-restricted to remain affordable to low- or moderate-income households for a period of 30 years.
9. All lots developed with affordable units must meet the criteria for subsidy and deed restrictions such that the units count toward the low- and moderate-income housing stock within the Town.
10. Per Rhode Island Law all lots to be developed with low- and moderate-income affordable housing units shall be: integrated throughout the development; compatible in scale, architectural style and materials to the market rate units within the project; and built and offered for occupancy simultaneously with the construction and occupancy of the market rate units. The applicant shall submit architectural plans for both proposed market rate units and deed restricted affordable units that include representative exterior elevations and material choices (i.e., windows, siding, roofing, fenestration, etc) for both types of units.
11. As part of the Preliminary Plan submittal, the applicant shall identify the specific lots that will contain the affordable housing units and shall propose the schedule according to which the affordable housing units will be constructed. Said schedule shall not exceed the construction of four (4) market-rate units for every one (1) affordable housing unit.

12. As part of the Preliminary Plan submittal, the applicant shall include a Letter of Eligibility from Rhode Island Housing for the project as proposed.
13. As part of the Preliminary Plan submittal, the applicant shall identify a monitoring agent to supervise occupancy requirements at the lots that will be developed with affordable housing units and provide drafts of a 'Monitoring Agreement' and a 'Deed Restriction' that will ensure that affordability guidelines will be met. Such documents shall be subject to the review and approval of the Town's Special Legal Counsel and the Planning Board.
14. The monitoring agent for the project shall be certified and qualified by the Rhode Island Housing and Mortgage Finance Corporation.
15. As part of the Preliminary Plan submittal, the applicant shall specify whether each affordable unit will be available for owner-occupancy (home ownership) or rental occupancy and shall specify the area median income (AMI), as determined by the U.S. Department of Housing and Urban Development (HUD), that will be used by the monitoring agent to qualify buyers or renters for occupancy.
16. The monitoring agreement between the developer and the monitoring agent shall require notification to the Town of South Kingstown, as a party with a vested interest, of the availability of affordable housing units for purchase or lease. Any such notification shall be directed to the Director of Planning.
17. As part of the Preliminary submittal, the applicant shall provide a traffic report detailing the anticipated traffic impacts from the proposed development and the adequacy of the existing and proposed roadways to safely accommodate existing and projected traffic.
18. Individual homes in the subdivision shall be served by on-site wastewater treatment systems designed to minimize potential water quality impacts from nitrogen loading.
19. The project design for the Preliminary Plan phase shall include a detailed erosion and sedimentation control plan including any proposed stockpile containment. The plan shall clearly identify the proposed limits of disturbance and incorporate best management practices as outlined in the Rhode Island Soil Erosion and Sedimentation Control Handbook.
20. Electric, telephone and cable services shall be installed underground.
21. Final design of the cul-de-sac shall conform to the requirements of the Union Fire District.
22. The applicant shall utilize low impact drainage methodologies in conformance with the Rhode Island Stormwater Design and Installation Standards Manual or other best management practices.
23. The Open Space Easement shall name the Town of South Kingstown as a grantee for the purposes of enforcing the covenants of the easement. The Easement shall include language that the open space is intended to be left in its natural state, however provisions may be included to allow for the removal of dead fall and the control of invasive plant material.
24. The applicant shall be required to submit a plan depicting where the stone walls that are to be disturbed as part of the development of the proposed 19 lot residential development will be rebuilt including estimated amount of stone that will be disturbed (i.e., cubic yards/tons). All onsite stone disturbed shall be used to construct new stone walls on site in the same linear footage (type and quantity of wall) on a one (1) for one (1) basis. The applicant shall submit a plan depicting

how the onsite stone walls will be rebuilt on site (i.e., location(s), specification for wall type/size). A detail associated with the reconstruction of the stone walls shall be added to the plan set at preliminary.

25. The applicant shall depict a plan to provide appropriate monumentation of the open space associated with the proposed development (ie. grant bounds/landscape boulders) in consultation with DPS.
26. The applicant shall submit a detailed landscape plan associated with the construction of the private drive and how the construction of the new private road will utilize new landscaping in a manner to minimize the visual impact of this new piece of infrastructure from Broad Rock Road and surrounding residential properties.
27. The applicant shall provide a plan depicting buffer landscaping along the southerly property line in the area of the old residential driveway that is planned to be abandoned.
28. The applicant shall evaluate the impact of invasive species impact on site and how the development.
29. The applicant shall clarify limits of proposed disturbance and areas of proposed protection as it relates to single lot development.
30. The Home Owners Association shall include a provision within their ownership documents for the open space that contains a provision that no motorized vehicles shall be allowed within the opens space area, with the exception of approved (Town Authorized with a plan) removal of deadfall and/or invasion plant material.

Said motion, made by Mr. Murphy, duly seconded by Mr. DiStefano, passed unanimously 6-0 (S. Axelrod; P. DiStefano; P. Jordan; M. Mack; J. Murphy; R. Pothier).

Respectfully,

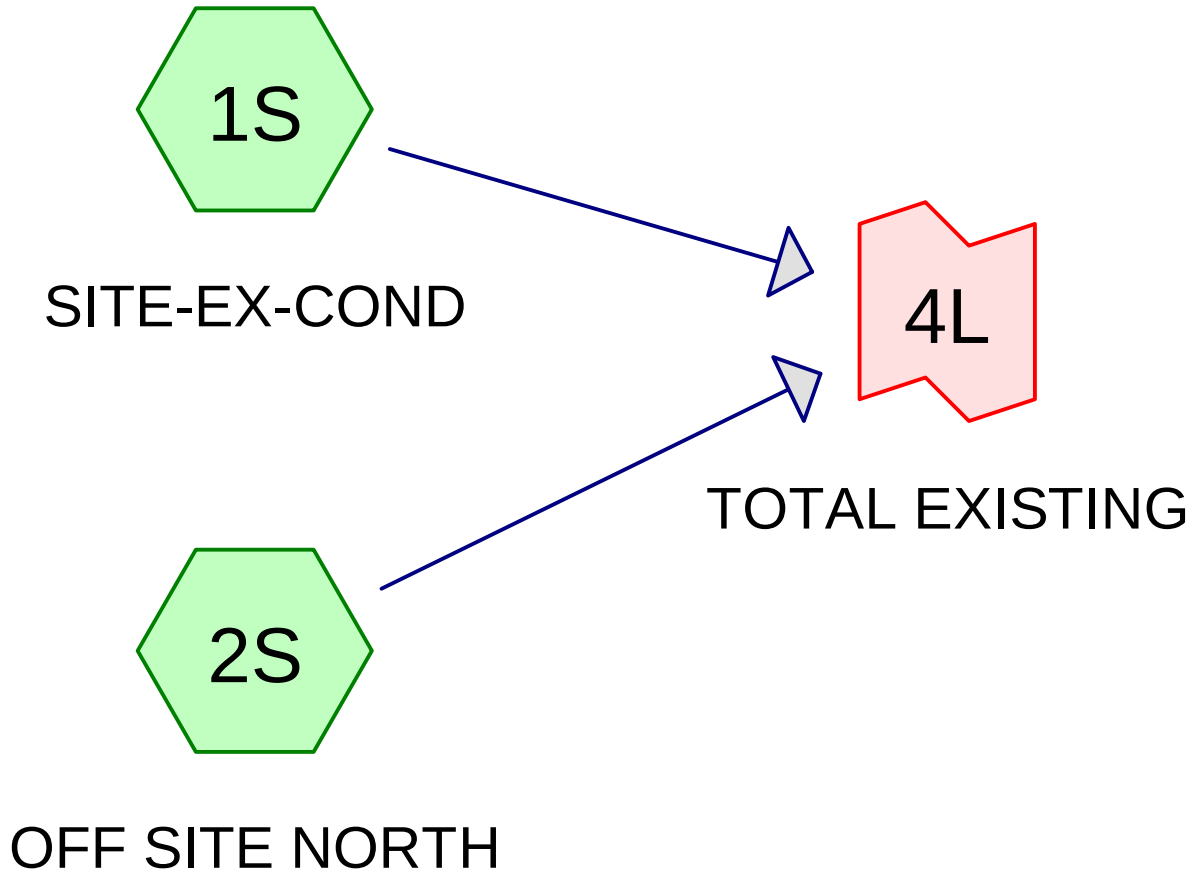
Maria H. Mack, Chair
Planning Board

APPENDIX-8

HYDROCAD PRINTOUTS

25-YEAR STORM

EXISTING & PROPOSED CONDITIONS



Subcat Reach Pond Link

Routing Diagram for 23011.00 EX-BROAD ROCK ROAD-1-29-2025 Town comments

Prepared by HP Inc.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.290	98	Paved parking, HSG B (1S, 2S)
0.080	98	Unconnected roofs, HSG B (1S)
0.380	98	Water Surface, HSG D (1S)
11.510	55	Woods, Good, HSG B (1S)
1.120	77	Woods, Good, HSG D (1S)
3.810	58	Woods/grass comb., Good, HSG B (1S, 2S)
17.190	**59**	**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: SITE-EX-COND Runoff Area=16.500 ac 4.42% Impervious Runoff Depth=1.92"
Flow Length=1,287' Tc=33.4 min CN=57/98 Runoff=18.15 cfs 2.639 af

Subcatchment 2S: OFF SITE NORTH Runoff Area=0.690 ac 2.90% Impervious Runoff Depth=1.94"
Tc=33.4 min CN=58/98 Runoff=0.78 cfs 0.111 af

Link 4L: TOTAL EXISTING Inflow=18.93 cfs 2.751 af
Primary=18.93 cfs 2.751 af

Total Runoff Area = 17.190 ac Runoff Volume = 2.751 af Average Runoff Depth = 1.92"
95.64% Pervious = 16.440 ac 4.36% Impervious = 0.750 ac

Summary for Subcatchment 1S: SITE-EX-COND

Runoff = 18.15 cfs @ 12.51 hrs, Volume= 2.639 af, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.080	98	Unconnected roofs, HSG B
0.270	98	Paved parking, HSG B
3.140	58	Woods/grass comb., Good, HSG B
11.510	55	Woods, Good, HSG B
0.380	98	Water Surface, HSG D
1.120	77	Woods, Good, HSG D
16.500	59	Weighted Average
15.770	57	95.58% Pervious Area
0.730	98	4.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.1	342	0.0320	2.68		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
5.0	400	0.0700	1.32		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.8	445	0.0360	0.95		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.4	1,287	Total			

Summary for Subcatchment 2S: OFF SITE NORTH

Runoff = 0.78 cfs @ 12.51 hrs, Volume= 0.111 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=6.10"

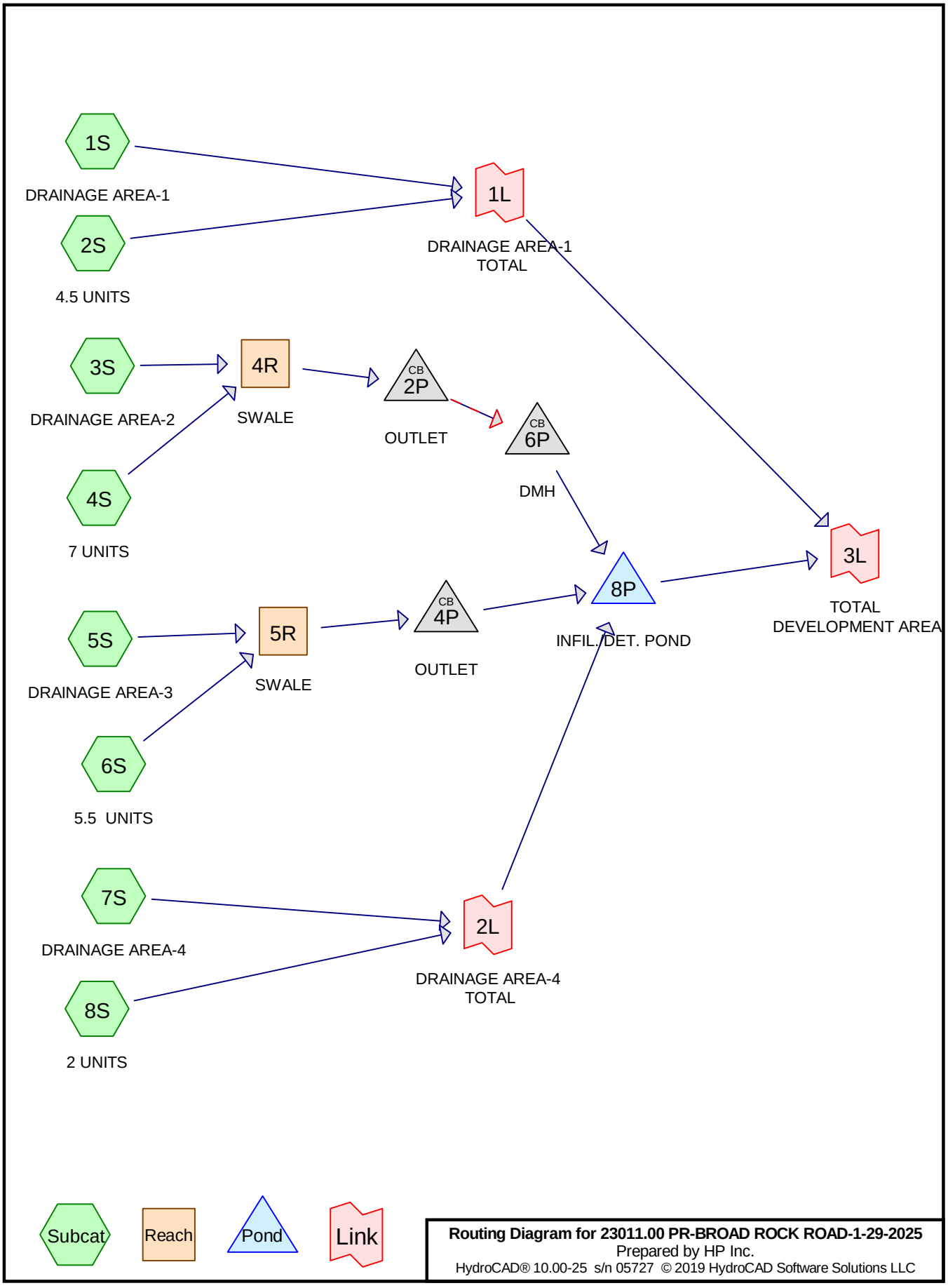
Area (ac)	CN	Description
0.020	98	Paved parking, HSG B
0.670	58	Woods/grass comb., Good, HSG B
0.690	59	Weighted Average
0.670	58	97.10% Pervious Area
0.020	98	2.90% Impervious Area

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

Summary for Link 4L: TOTAL EXISTING

Inflow Area = 17.190 ac, 4.36% Impervious, Inflow Depth = 1.92" for 25 YR event
Inflow = 18.93 cfs @ 12.51 hrs, Volume= 2.751 af
Primary = 18.93 cfs @ 12.51 hrs, Volume= 2.751 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs



Routing Diagram for 23011.00 PR-BROAD ROCK ROAD-1-29-2025
Prepared by HP Inc.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.121	61	>75% Grass cover, Good, HSG B (1S, 3S, 5S, 7S)
1.109	98	Paved parking, HSG B (1S, 3S, 5S)
0.667	98	Roofs, HSG B (2S, 4S, 6S, 8S)
0.670	98	Water Surface, 0% imp, HSG B (7S)
0.380	98	Water Surface, 0% imp, HSG D (1S)
5.800	55	Woods, Good, HSG B (1S)
1.120	77	Woods, Good, HSG D (1S)
1.323	58	Woods/grass comb., Good, HSG B (3S, 5S, 7S)
17.190	**66**	**TOTAL AREA**

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points x 9
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 1S: DRAINAGE AREA-1 Runoff Area=8.930 ac 0.22% Impervious Runoff Depth=2.07"
Flow Length=1,201' Tc=22.6 min CN=61 Runoff=13.22 cfs 1.542 af

Subcatchment 2S: 4.5 UNITS Runoff Area=0.158 ac 100.00% Impervious Runoff Depth=5.86"
Tc=5.0 min CN=98 Runoff=0.98 cfs 0.077 af

Subcatchment 3S: DRAINAGE AREA-2 Runoff Area=2.660 ac 19.55% Impervious Runoff Depth=2.70"
Flow Length=1,163' Tc=22.8 min CN=68 Runoff=5.30 cfs 0.598 af

Subcatchment 4S: 7 UNITS Runoff Area=0.246 ac 100.00% Impervious Runoff Depth=5.86"
Tc=5.0 min CN=98 Runoff=1.52 cfs 0.120 af

Subcatchment 5S: DRAINAGE AREA-3 Runoff Area=2.306 ac 24.67% Impervious Runoff Depth=2.88"
Flow Length=1,213' Tc=16.7 min CN=70 Runoff=5.62 cfs 0.554 af

Subcatchment 6S: 5.5 UNITS Runoff Area=0.193 ac 100.00% Impervious Runoff Depth=5.86"
Tc=5.0 min CN=98 Runoff=1.20 cfs 0.094 af

Subcatchment 7S: DRAINAGE AREA-4 Runoff Area=2.627 ac 0.00% Impervious Runoff Depth=2.88"
Flow Length=1,362' Tc=23.9 min CN=70 Runoff=5.52 cfs 0.632 af

Subcatchment 8S: 2 UNITS Runoff Area=0.070 ac 100.00% Impervious Runoff Depth=5.86"
Tc=3.0 min CN=98 Runoff=0.47 cfs 0.034 af

Reach 4R: SWALE Avg. Flow Depth=0.27' Max Vel=4.19 fps Inflow=5.82 cfs 0.718 af
n=0.025 L=297.0' S=0.0370 '/' Capacity=100.51 cfs Outflow=5.81 cfs 0.718 af

Reach 5R: SWALE Avg. Flow Depth=0.29' Max Vel=3.98 fps Inflow=6.15 cfs 0.649 af
n=0.025 L=525.0' S=0.0305 '/' Capacity=91.17 cfs Outflow=6.07 cfs 0.649 af

Pond 2P: OUTLET Peak Elev=61.84' Inflow=5.81 cfs 0.718 af
18.0" Round Culvert n=0.011 L=13.0' S=0.0208 '/' Outflow=5.81 cfs 0.718 af

Pond 4P: OUTLET Peak Elev=63.81' Inflow=6.07 cfs 0.649 af
18.0" Round Culvert n=0.011 L=90.0' S=0.0728 '/' Outflow=6.07 cfs 0.649 af

Pond 6P: DMH Peak Elev=61.32' Inflow=5.81 cfs 0.718 af
18.0" Round Culvert n=0.011 L=120.0' S=0.0383 '/' Outflow=5.81 cfs 0.718 af

Pond 8P: INFIL./DET. POND Peak Elev=58.39' Storage=62,438 cf Inflow=17.21 cfs 2.033 af
Discarded=0.57 cfs 0.902 af Primary=0.00 cfs 0.000 af Outflow=0.57 cfs 0.902 af

Link 1L: DRAINAGE AREA-1 TOTAL Inflow=13.55 cfs 1.620 af
Primary=13.55 cfs 1.620 af

Link 2L: DRAINAGE AREA-4 TOTAL Inflow=5.64 cfs 0.666 af
Primary=5.64 cfs 0.666 af

Link 3L: TOTAL DEVELOPMENT AREA

Inflow=13.55 cfs 1.620 af
Primary=13.55 cfs 1.620 af

Total Runoff Area = 17.190 ac Runoff Volume = 3.652 af Average Runoff Depth = 2.55"
89.67% Pervious = 15.414 ac 10.33% Impervious = 1.776 ac

Summary for Subcatchment 1S: DRAINAGE AREA-1

Runoff = 13.22 cfs @ 12.33 hrs, Volume= 1.542 af, Depth= 2.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
1.610	61	>75% Grass cover, Good, HSG B
5.800	55	Woods, Good, HSG B
0.380	98	Water Surface, 0% imp, HSG D
1.120	77	Woods, Good, HSG D
0.020	98	Paved parking, HSG B
8.930	61	Weighted Average
8.910	61	99.78% Pervious Area
0.020	98	0.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.8	483	0.0370	2.89		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.8	327	0.0430	3.11		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
3.9	291	0.0620	1.24		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
22.6	1,201	Total			

Summary for Subcatchment 2S: 4.5 UNITS

Runoff = 0.98 cfs @ 12.07 hrs, Volume= 0.077 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.158	98	Roofs, HSG B
0.158	98	100.00% Impervious Area

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

Summary for Subcatchment 3S: DRAINAGE AREA-2

Runoff = 5.30 cfs @ 12.33 hrs, Volume= 0.598 af, Depth= 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.350	58	Woods/grass comb., Good, HSG B
0.520	98	Paved parking, HSG B
1.790	61	>75% Grass cover, Good, HSG B
2.660	68	Weighted Average
2.140	61	80.45% Pervious Area
0.520	98	19.55% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
2.1	324	0.0300	2.60		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.4	281	0.0490	3.32		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.1	67	0.0450	13.73	411.75	**Channel Flow,** Area= 30.0 sf Perim= 32.0' r= 0.94' n= 0.022 Earth, clean & straight
0.1	118	0.0590	15.11	18.54	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.6	273	0.0580	7.68	245.62	**Channel Flow,** Area= 32.0 sf Perim= 62.0' r= 0.52' n= 0.030 Earth, grassed & winding
22.8	1,163	Total			

Summary for Subcatchment 4S: 7 UNITS

Runoff = 1.52 cfs @ 12.07 hrs, Volume= 0.120 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.246	98	Roofs, HSG B
0.246	98	100.00% Impervious Area

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

Summary for Subcatchment 5S: DRAINAGE AREA-3

Runoff = 5.62 cfs @ 12.23 hrs, Volume= 0.554 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.353	58	Woods/grass comb., Good, HSG B
0.569	98	Paved parking, HSG B
1.384	61	>75% Grass cover, Good, HSG B
2.306	70	Weighted Average
1.737	60	75.33% Pervious Area
0.569	98	24.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.2	57	0.0700	3.97		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
1.6	683	0.0400	7.18	84.00	**Channel Flow,** Area= 11.7 sf Perim= 30.2' r= 0.39' n= 0.022 Earth, clean & straight
0.2	100	0.0200	8.80	10.80	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
0.6	273	0.0580	7.68	245.62	**Channel Flow,** Area= 32.0 sf Perim= 62.0' r= 0.52' n= 0.030 Earth, grassed & winding
16.7	1,213	Total			

Summary for Subcatchment 6S: 5.5 UNITS

Runoff = 1.20 cfs @ 12.07 hrs, Volume= 0.094 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.193	98	Roofs, HSG B
0.193	98	100.00% Impervious Area

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

Summary for Subcatchment 7S: DRAINAGE AREA-4

Runoff = 5.52 cfs @ 12.35 hrs, Volume= 0.632 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.620	58	Woods/grass comb., Good, HSG B
0.670	98	Water Surface, 0% imp, HSG B
1.337	61	>75% Grass cover, Good, HSG B
2.627	70	Weighted Average
2.627	70	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	100	0.0100	0.09		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
4.2	658	0.0310	2.64		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.2	58	0.1700	6.18		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
0.4	273	0.0580	11.43	342.80	**Channel Flow,** Area= 30.0 sf Perim= 32.0' r= 0.94' n= 0.030 Earth, grassed & winding
0.6	273	0.0580	7.35	220.57	**Channel Flow,** Area= 30.0 sf Perim= 62.0' r= 0.48' n= 0.030 Earth, grassed & winding
23.9	1,362	Total			

Summary for Subcatchment 8S: 2 UNITS

Runoff = 0.47 cfs @ 12.04 hrs, Volume= 0.034 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25 YR Rainfall=6.10"

Area (ac)	CN	Description
0.070	98	Roofs, HSG B
0.070	98	100.00% Impervious Area

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

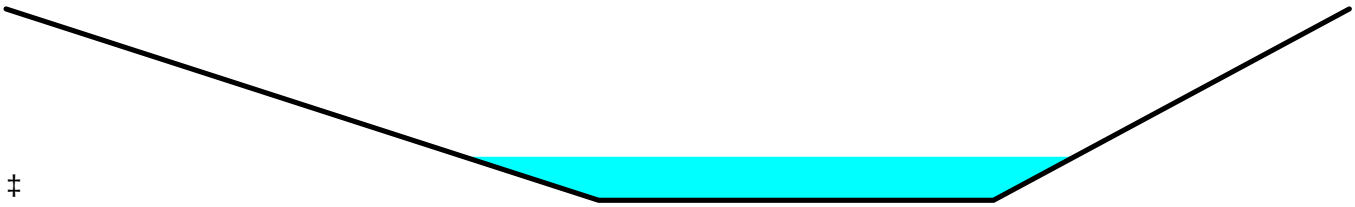
Summary for Reach 4R: SWALE

Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 2.97" for 25 YR event
Inflow = 5.82 cfs @ 12.31 hrs, Volume= 0.718 af
Outflow = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af, Atten= 0%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Max. Velocity= 4.19 fps, Min. Travel Time= 1.2 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 4.1 min

Peak Storage= 411 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.20' Flow Area= 10.6 sf, Capacity= 100.51 cfs

4.00' x 1.20' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 5.0 3.0 '/' Top Width= 13.60'
Length= 297.0' Slope= 0.0370 '/'
Inlet Invert= 72.00', Outlet Invert= 61.00'



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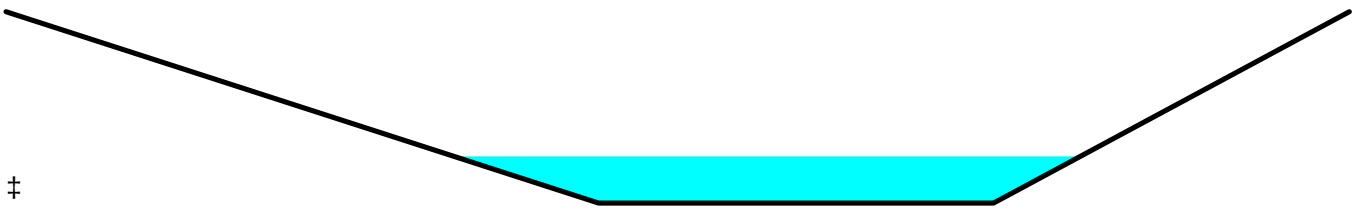
Summary for Reach 5R: SWALE

Inflow Area = 2.499 ac, 30.49% Impervious, Inflow Depth = 3.11" for 25 YR event
Inflow = 6.15 cfs @ 12.23 hrs, Volume= 0.649 af
Outflow = 6.07 cfs @ 12.25 hrs, Volume= 0.649 af, Atten= 1%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Max. Velocity= 3.98 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.07 fps, Avg. Travel Time= 8.2 min

Peak Storage= 802 cf @ 12.25 hrs
Average Depth at Peak Storage= 0.29'
Bank-Full Depth= 1.20' Flow Area= 10.6 sf, Capacity= 91.17 cfs

4.00' x 1.20' deep channel, n= 0.025 Earth, clean & winding
Side Slope Z-value= 5.0 3.0 '/' Top Width= 13.60'
Length= 525.0' Slope= 0.0305 '/'
Inlet Invert= 80.00', Outlet Invert= 64.00'



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Summary for Pond 2P: OUTLET

Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 2.97" for 25 YR event
Inflow = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af
Outflow = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af, Atten= 0%, Lag= 0.0 min
Primary = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 61.84' @ 12.33 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	60.47'	**18.0" Round Culvert** L= 13.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 60.47' / 60.20' S= 0.0208 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=5.81 cfs @ 12.33 hrs HW=61.84' TW=61.32' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.81 cfs @ 4.51 fps)

Summary for Pond 4P: OUTLET

Inflow Area = 2.499 ac, 30.49% Impervious, Inflow Depth = 3.11" for 25 YR event
Inflow = 6.07 cfs @ 12.25 hrs, Volume= 0.649 af
Outflow = 6.07 cfs @ 12.25 hrs, Volume= 0.649 af, Atten= 0%, Lag= 0.0 min
Primary = 6.07 cfs @ 12.25 hrs, Volume= 0.649 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 63.81' @ 12.25 hrs
Flood Elev= 64.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	62.55'	**18.0" Round Culvert** L= 90.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 62.55' / 56.00' S= 0.0728 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=6.07 cfs @ 12.25 hrs HW=63.81' TW=56.27' (Dynamic Tailwater)
1=Culvert (Inlet Controls 6.07 cfs @ 3.83 fps)

Summary for Pond 6P: DMH

Inflow Area = 2.906 ac, 26.36% Impervious, Inflow Depth = 2.97" for 25 YR event
Inflow = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af
Outflow = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af, Atten= 0%, Lag= 0.0 min
Primary = 5.81 cfs @ 12.33 hrs, Volume= 0.718 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 61.32' @ 12.33 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	60.10'	**18.0" Round Culvert**

L= 120.0' RCP, sq.cut end projecting, Ke= 0.500
Inlet / Outlet Invert= 60.10' / 55.50' S= 0.0383 '/' Cc= 0.900
n= 0.011 Concrete pipe, straight & clean, Flow Area= 1.77 sf

Primary OutFlow Max=5.81 cfs @ 12.33 hrs HW=61.32' TW=56.53' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.81 cfs @ 3.76 fps)

Summary for Pond 8P: INFIL./DET. POND

Inflow Area = 8.102 ac, 19.72% Impervious, Inflow Depth = 3.01" for 25 YR event
Inflow = 17.21 cfs @ 12.30 hrs, Volume= 2.033 af
Outflow = 0.57 cfs @ 19.32 hrs, Volume= 0.902 af, Atten= 97%, Lag= 421.4 min
Discarded = 0.57 cfs @ 19.32 hrs, Volume= 0.902 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs / 9
Peak Elev= 58.39' @ 19.32 hrs Surf.Area= 24,140 sf Storage= 62,438 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 356.8 min (1,198.9 - 842.1)

Volume	Invert	Avail.Storage	Storage Description
#1	55.00'	121,242 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.00	9,400	0	0
56.00	17,167	13,284	13,284
58.00	22,907	40,074	53,358
60.00	29,297	52,204	105,562
60.50	33,423	15,680	121,242

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	59.00'	**24.0' long x 2.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50
			Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Discarded OutFlow Max=0.57 cfs @ 19.32 hrs HW=58.39' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.57 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.00' TW=0.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link 1L: DRAINAGE AREA-1 TOTAL

Inflow Area = 9.088 ac, 1.96% Impervious, Inflow Depth = 2.14" for 25 YR event
Inflow = 13.55 cfs @ 12.33 hrs, Volume= 1.620 af
Primary = 13.55 cfs @ 12.33 hrs, Volume= 1.620 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link 2L: DRAINAGE AREA-4 TOTAL

Inflow Area = 2.697 ac, 2.60% Impervious, Inflow Depth = 2.96" for 25 YR event
Inflow = 5.64 cfs @ 12.34 hrs, Volume= 0.666 af
Primary = 5.64 cfs @ 12.34 hrs, Volume= 0.666 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Link 3L: TOTAL DEVELOPMENT AREA

Inflow Area = 17.190 ac, 10.33% Impervious, Inflow Depth = 1.13" for 25 YR event
Inflow = 13.55 cfs @ 12.33 hrs, Volume= 1.620 af
Primary = 13.55 cfs @ 12.33 hrs, Volume= 1.620 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

APPENDIX-9

CULVERT SIZING WORKSHEET

AND CATCHMENT AREA MAP

CULVERT SIZING WORKSHEET

Culvert ID	Runoff C Woods = 0.15 Grass = 0.15 Imperv. = 0.95	Composite C	Time of Conc. (min.)	25-YR Rainfall intensity, in/hr	Peak Runoff Rate (C*I*A) C.F.S.	Culvert Capacity at Town min. slope of 1.0%, C.F.S.	Headwater Depth for Inlet Control, HW/D
Lot 1	Woods = 0.30 ac. Grass = 0.13 ac. Imperv. = 0.10 ac Total = 0.53 ac.	0.30	10 min.	5.2	0.83	15” pipe has a capacity of 6.2	Less than 0.5
Lot 2	Woods = 0.41 ac. Grass = 0.35 ac. Imperv. = 0.21 ac Total = 0.97 ac.	0.32	10 min.	5.2	1.62	15” pipe has a capacity of 6.2	0.57
Lot 3	Woods = 0.52 ac. Grass = 0.64 ac. Imperv. = 0.32 ac Total = 1.48 ac.	0.32	10 min.	5.2	2.46	15” pipe has a capacity of 6.2	0.75
Lot 4	Woods = 0.52 ac. Grass = 0.93 ac. Imperv. = 0.43 ac Total = 1.88 ac.	0.33	15 min.	4.4	2.73	15” pipe has a capacity of 6.2	0.77
Lot 5	Woods = 0.52 ac. Grass = 1.04 ac. Imperv. = 0.48 ac Total = 2.04 ac.	0.34	15 min.	4.4	3.05	15” pipe has a capacity of 6.2	0.84
Lot 6	Woods = 0.14 ac. Grass = 1.63 ac. Imperv. = 0.59 ac Total = 2.36 ac.	0.35	10 min.	5.2	4.30	15” pipe has a capacity of 6.2	1.03
Lot 7	Woods = 0.11 ac. Grass = 0.83 ac. Imperv. = 0.39 ac	0.37	10 min.	5.2	2.63	15” pipe has a capacity of 6.2	0.76

CULVERT SIZING WORKSHEET

Culvert ID	Runoff C Woods = 0.15 Grass = 0.15 Imperv. = 0.95	Composite C	Time of Conc. (min.)	25-YR Rainfall intensity, in/hr	Peak Runoff Rate (C*I*A) C.F.S.	Culvert Capacity at Town min. slope of 1.0%, C.F.S.	Headwater Depth for Inlet Control, HW/D
	Total = 1.33 ac.						
Lot 5/6 Culvert under road	Woods = 0.52 ac. Grass = 1.36 ac. Imperv. = 0.59 ac Total = 2.47 ac.	0.34	15 min.	4.4	3.70	18" pipe has a capacity of 10.5	0.72
Lot 6 Culvert under road	Woods = 0.14 ac. Grass = 1.97 ac. Imperv. = 0.79 ac Total = 2.90 ac.	0.37	15 min.	4.4	4.72	18" pipe has a capacity of 10.5	0.83

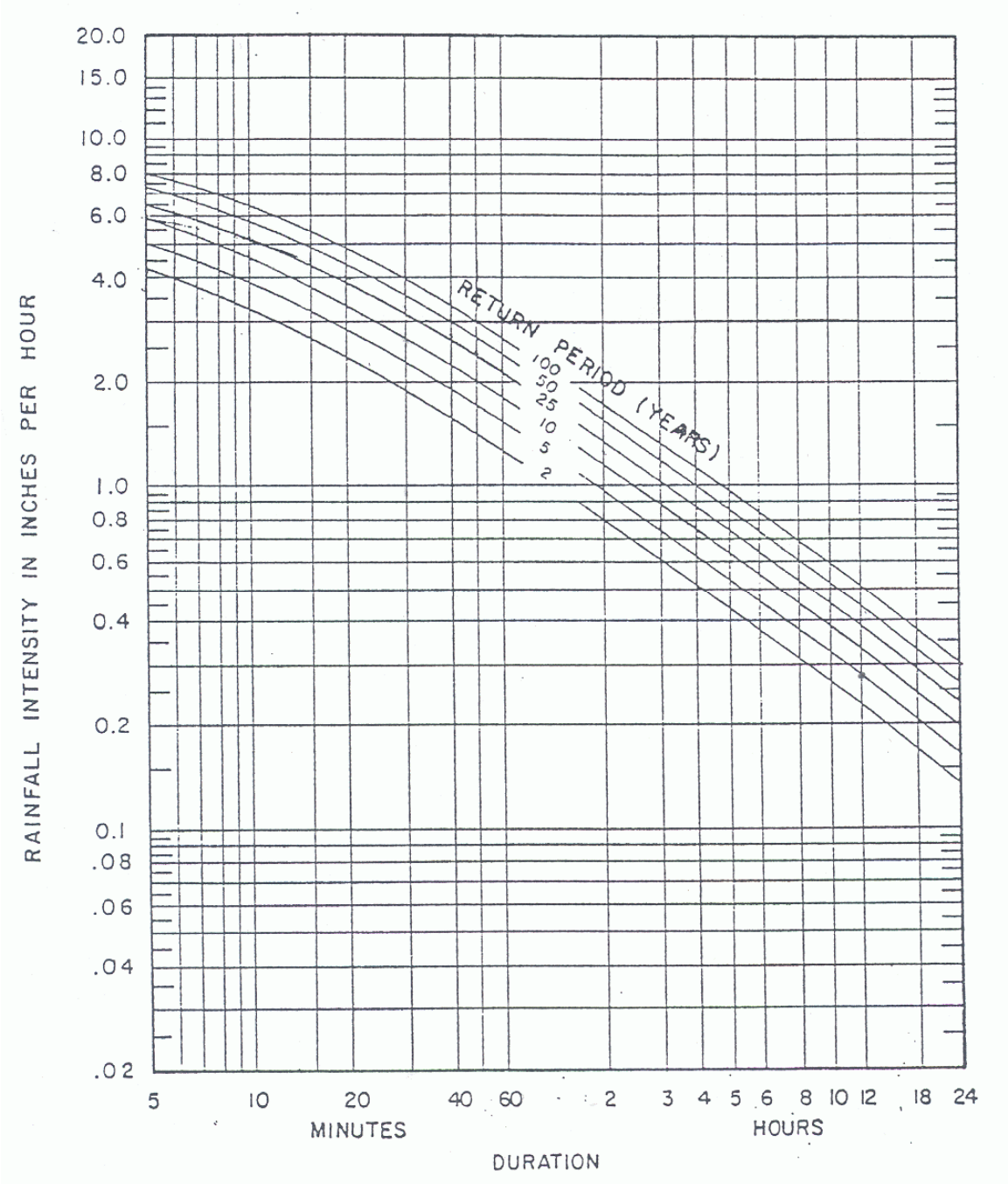
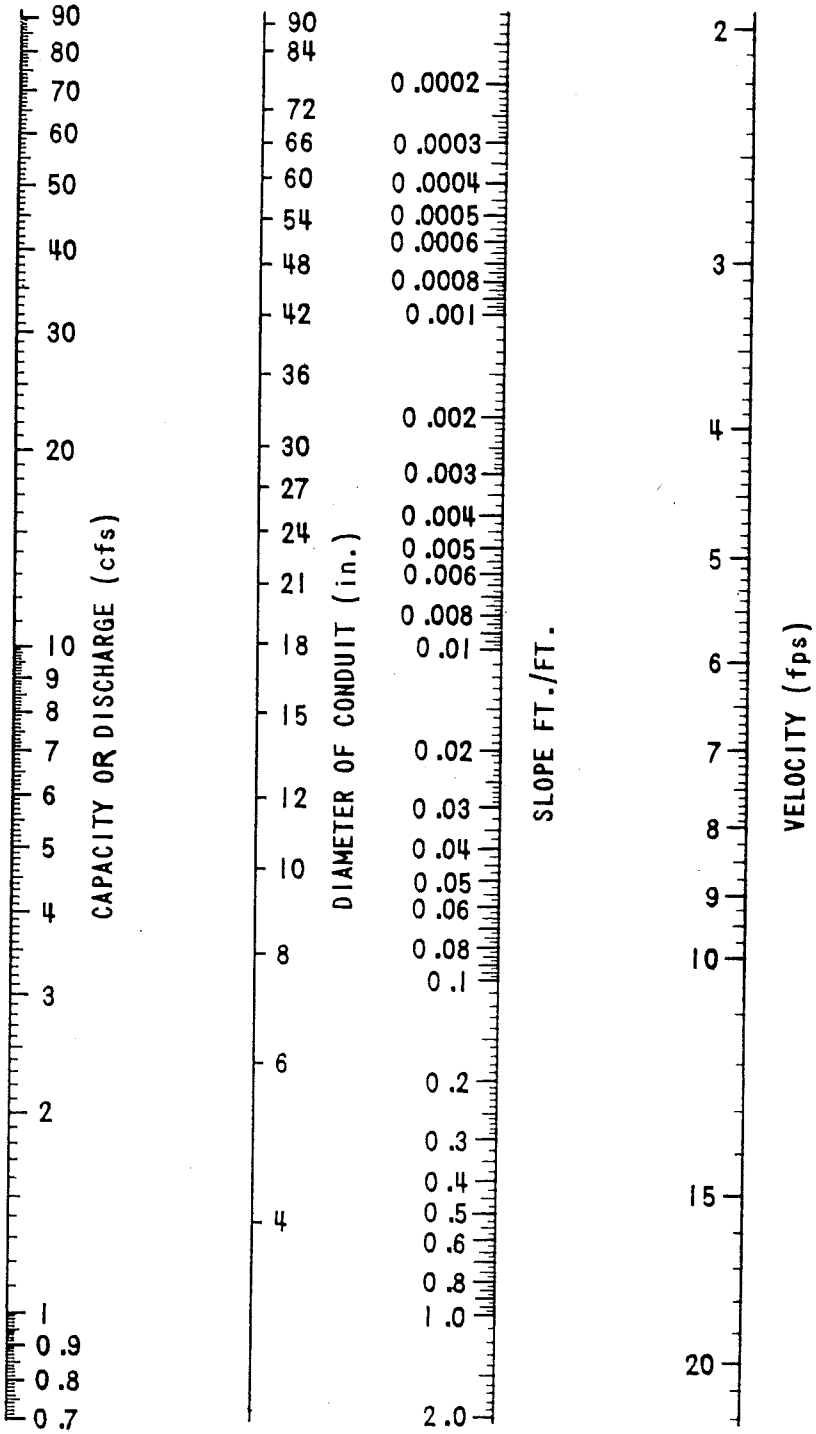


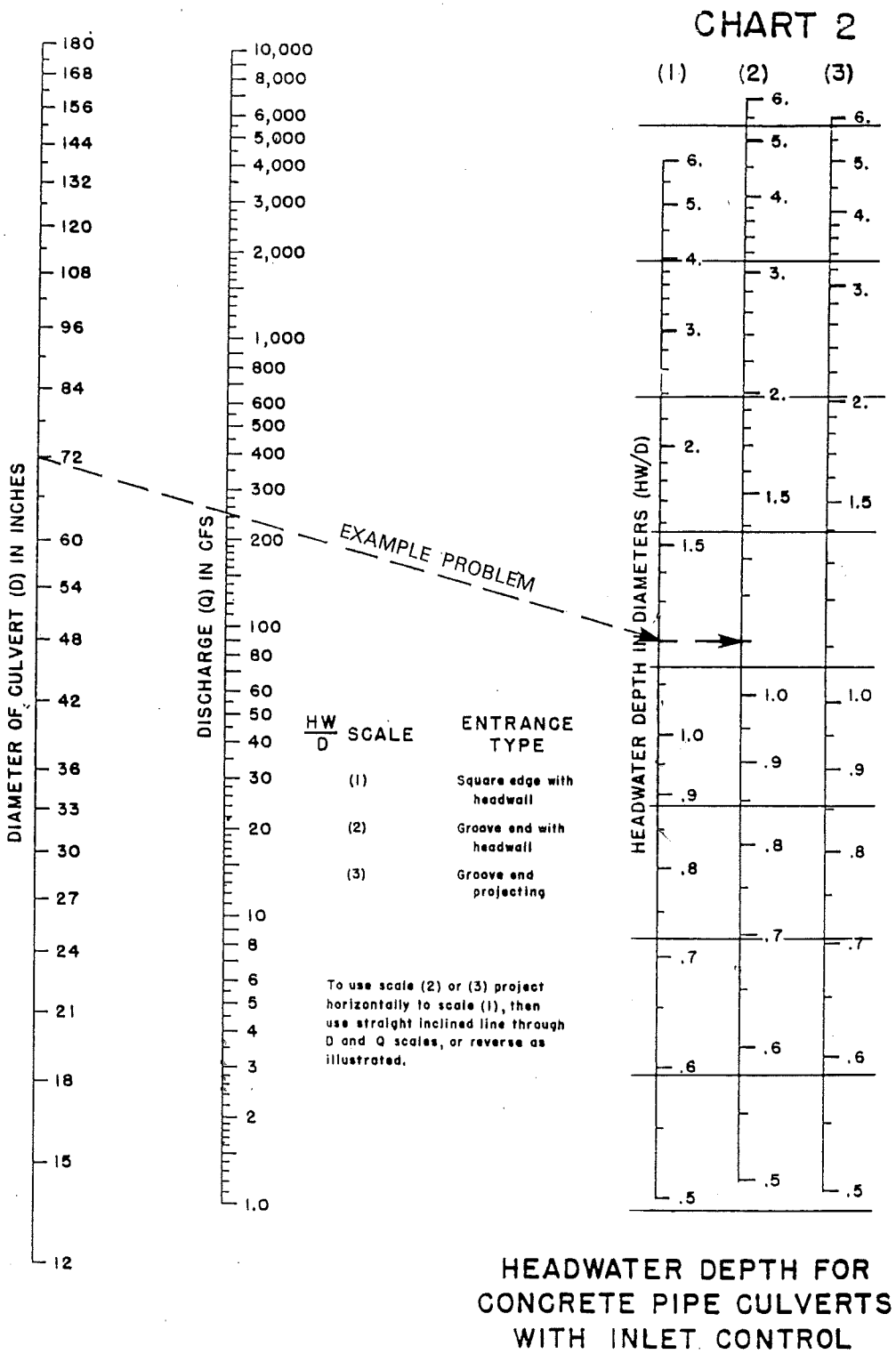
Figure 8-1. Rainfall Intensity-Duration-Frequency Graph for Providence, RI and Vicinity (derived from U.S. Department of Commerce *Technical Paper No. 40* and NOAA *Technical Memorandum NWS HYDRO-35*).



Nomograph based on Manning's formula for circular pipes flowing full in which n=0.013.

Reference: Hydraulics Manual, Oregon Department of Transportation.

Figure 10-31. Concrete Pipe Flowing Full



Reference: Hydraulic Charts for the Selection of Highway Culverts, HEC #5, FHWA.

Figure 10-25. Example 4 — HEC #5

LAND UNSUITABLE FOR DEVELOPMENT:

WETLANDS =	1.17 AC.
HIGH FLOOD DANGER ZONE =	0.45 AC.

DRAINAGE TEST HOLES:

D1 05/08/24
0"–12" SL, CAT. 3
12"–42" FSL CAT. 4
42"–53" VFLS, CAT. 7
53"–108" GRS, CAT.8M
* NO SEEPAGE
* E.S.H.W.T.=8 FEET
* NO REFUSAL

D2 05/08/24
0"–10" SL, CAT. 3
10"–42" FSL CAT. 4
42"–57" VFLS, CAT. 7
57"–120" GRS, CAT.8M
* NO SEEPAGE
* E.S.H.W.T.=8 FEET
* NO REFUSAL

NOTES:

1. EXISTING PARCEL, (A.P. 33 LOT 24) CONSIST OF 16.50±ACRES THAT ARE ZONED R–40.
2. WETLAND FLAGS DELINEATED BY AVIZINIS ENVIRONMENTAL SERVICES, INC. 2022.
3. OFF SITE BUILDING LOCATIONS ARE APPROXIMATE AND HAVE BEEN TAKEN FROM AERIAL PHOTOGRAPHY.
4. ABUTTING PROPERTY OWTS' TAKEN FROM PLANS OF RECORD.
5. ELEVATIONS BASED ON NAVD88 VERTICAL DATUM.
6. A SMALL PORTION OF SUBJECT SITE IS SITUATED IN FEMA 100–YR FLOOD ZONE 'A' AS DEPICTED ON MAP 44009C0201J, EFFECTIVE 4/3/2020. THE REMAINING PORTION OF THE SITE IS SITUATED IN ZONE 'X' WHICH IS AREA OF MINIMAL FLOOD HAZARD.
7. THE BmA SOIL TYPE IS CONSIDERED A 'PRIME AGRICULTURAL SOIL'..
8. THIS IS NOT A SURVEY BOUNDARY PLAN, REFER TO SURVEY PLAN AT THE REAR OF THE PLAN SET. SURVEY INFORMATION PROVIDED BY COMMONWEALTH LAND SURVEYORS, INC.

OWNER:
SHELEEN CLARKE
96 DUCK COVE ROAD
NORTH KINGSTOWN, RI 02852

APPLICANT:
NEW ENGLAND PROPERTIES, LLC
257 WICKFORD CT.
NORTH KINGSTOWN, RI 02852

LEGEND

ABUTTER LINE
LOT LINE
EDGE OF ROAD PAVEMENT
ROADWAY CENTERLINE
ROADWAY STATION — 2+00
TEST HOLE — TH
PERC TEST — PT
LEDGE TEST — LT
UTILITY POLE
WETLAND EDGE — WF-A6 WF-A7
200' RIVER BUFFER ZONE
20' STRUCTURE SETBACK
EXISTING STONEWALL
UNDERGROUND TELE/COMM — T
OPEN SPACE MARKER — OS

BUILDING SETBACK LINE
EXISTING CONTOUR — 122
EXISTING SPOT GRADE — x123.0
PROPOSED LOT CONTOUR — 82
PROPOSED SPOT GRADE — X63.50
DRAINAGE MANHOLE — DMH
HYDRANT
DRAIN LINE — D
WATERLINE — W
OVERHEAD WIRES — OHW
UNDERGROUND ELECTRIC/TELE. — E
SOIL BOUNDARY LINE
FEMA 100–YR FLOOD ZONE
CURB STOP
WATER VALVE — WV
PROPOSED STONE WALL

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1 inch = 60 ft.

PROPOSED GRADING & DRAINAGE PLAN

SCALE: 1" = 60'

TIMOTHY J. BEHAN
STATE OF RHODE ISLAND
No 6278
HOPE
REGISTERED PROFESSIONAL ENGINEER
1/30/2025

REVISIONS

No.	DATE	DRWN	CHKD
1	4/2/24	TB	TB
2	4/18/24	TB	TB
3	9/6/24	SMA	TB
4	9/30/24	SMA	TB
5	10/21/24	SMA	TB
6	11/24/24	SMA	TB
7	01/30/25	SMA	TB

COMMONWEALTH
ENGINEERS & CONSULTANTS, INC.
400 SMITH STREET
PROVIDENCE, RHODE ISLAND 02908
(401) 273–6600

PERMIT AGENCY REVIEW PLAN
FOR
VILLAGE AT BROAD ROCK
PLAT 33, LOT 24
ON
BROAD ROCK ROAD
SOUTH KINGSTOWN, RHODE ISLAND

PROPOSED GRADING & DRAINAGE PLAN

SCALE: AS SHOWN	SHEET NO: 5 OF 17	
DRAWN BY: SMA	DESIGN BY: SMA	CHECKED BY: TJB
DATE: FEBRUARY 2024	PROJECT NO 23011.00	