DRAINAGE ANALYSIS & SEDIMENT AND EROSION CONTROL PLAN

Prepared for:
RED BARN PROPERTY LLC
RESIDENTIAL SUBDIVISION PLAN

Prepared by:

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVENUE
STRATHAM, NH 03885

Project Number:
NH-1566
210 Portsmouth Avenue
Stratham, New Hampshire
March 11, 2026
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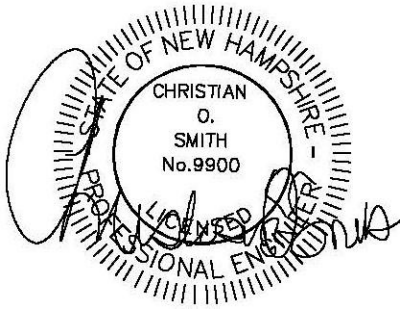


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1.0 ANALYSIS SUMMARY

Red Barn Property LLC proposes to construct a subdivision plan to construct 4 new duplexes on an 11.1+-acre parcel of land located on Portsmouth Avenue in Stratham New Hampshire. A drainage analysis of 4.8+ acres of the proposed site improvement area was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate drainage structures. Two models were compiled: one for the area in its existing (pre-construction) condition and a second for its proposed (post-construction) condition. The analysis was conducted using Extreme Precipitation data provided by Cornell University for the following 24-hour duration storm events:

Storm Event	Rainfall Depth (inches)
2-Year	3.20
10-Year	4.87
25-Year	6.19
50-Year (Ponds Only)	7.42

These storm events use the USDA NRCS TR-20 method within the HydroCAD Stormwater Modeling System environment to model the rainfall and predict stormwater runoff flows and volumes. A Type III storm pattern was used in the model. Additionally, the 50-year 24-hour storm event was analyzed for the HydroCAD proposed "ponds". The purpose of this analysis is to estimate the peak rates of run-off from the site for detention adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

Peak Rate of Discharge

		Component Peak Rate of Discharge (CFS)		
Analysis Point # Analysis Point Description	**Condition**	**2-Year**	**10-Year**	**25-Year**
Reach #100 Flow to Route 33	Existing	0.60	1.21	1.72
	Proposed	1.11	2.08	2.90
Reach #200 Flow to South/Pond	Existing	1.89	4.06	5.95
	Proposed	1.37	2.80	4.03
Reach #300 Flow to Southeast	Existing	1.18	3.73	6.19
	Proposed	1.10	3.31	5.43

Channel Protection

Analysis Point # Analysis Point Description	Condition	2-Year Storm Volume (Acre-Feet)
Reach #100 Flow to Route 33	Existing	0.047
	Proposed	0.089
Reach #200 Flow to South/Pond	Existing	0.170
	Proposed	0.112
Reach #300 Flow to Southeast	Existing	0.132
	Proposed	0.121

The proposed development includes a new paved private roadway into the site where the existing northern driveway exists. This roadway will extend into the site to provide access to 4 proposed duplexes and a reconstructed barn. The proposed improvement area includes three different subcatchments. The peak rate of runoff in the proposed conditions for the two subcatchments into the site is decreased from that of the existing conditions, due to the addition of three bioretention ponds. All paved and gravel areas in subcatchments #200 and #300 receives treatment from a forebay and bioretention pond prior to discharging overland towards the adjacent wetlands. Peak flows and storm volume for subcatchment #100 towards Portsmouth Avenue have increases due to the addition of the paved roadway. NHDOT has reviewed and approved this drainage design including the impact and capacity of the existing swale along Portsmouth Avenue. In addition, the potential for increased erosion and sedimentation is handled by way of silt barrier surrounding the disturbed areas. The use of Best Management Practices per the Rockingham Conservation District / DES Handbook have been applied to the design of these structures and will be observed during all stages of construction. All land disturbed during construction will be stabilized within 30 days of groundbreaking. Existing wetlands and abutters will suffer no adverse effects resulting from this proposed development.

2.0 EXISTING CONDITIONS ANALYSIS

The existing property is located on a parcel consisting of an existing duplex, barn, gravel driveways and parking areas, woodlands, lawns, and onsite wetlands. The existing topography is such that the site analysis is divided into three subcatchments within the area proposed to be improved. Final Reach #100 flows to the existing swale along Portsmouth Avenue, Final Reach #200 flows to the South to an existing wetland, and Reach #300 flows to an existing wetland to the southeast.

Classified by a Site-Specific Soil Mapping, the land of the site is composed of relatively flat slopes and soils categorized into the Hydrologic Soil Groups (HSG) B, C, and D (See appendix for Hiss/HSG designations).

3.0 PROPOSED CONDITIONS ANALYSIS

The addition of the impervious area and clearing of trees causes an increase in the curve number (Cn) and a decrease in the time of concentration (Tc) which results in a potential increase in peak rates of runoff from the site. To reduce these flows to pre-development conditions, various stormwater management systems will be proposed. The proposed development divides the site into several different post-construction subcatchments, but ultimately the three main subcatchments match the pre-construction analysis. The runoff is directed to offsite areas through HydroCAD “reaches” and “ponds”, consisting of three bioretention ponds.

In an effort to prevent the sedimentation of abutting properties, the paved private roadway and fire truck turn around areas will be graded to flow into a sediment forebay prior to flowing towards one of three bioretention ponds where possible. During construction, appropriate Best Management Practices (BMP's) will be applied so as to negate the potential for sediment-laden run-off to discharge off-site prior to the final stabilization of the proposed grading. The structures outlined in this proposal provide for adequate treatment of stormwater run-off for sediment control.

4.0 SEDIMENT & EROSION CONTROL PLANS BEST MANAGEMENT PRACTICES (BMP's)

The proposed site development is protected from erosion and the roadways and abutting properties are protected from sediment by the use of Best Management Practices as outlined in the New Hampshire Stormwater Manual. Any area disturbed by construction will be re-stabilized within 30 days, and abutting properties and wetlands will not be adversely affected by this development. All swales and drainage structures will be constructed and stabilized prior to having run-off directed to them.

4.1 Silt Barrier / Construction Fence

The plan set demonstrates the location of silt barriers for sediment control. Sheet E-1, Erosion and Sediment Control Details, has the specifications for installation and maintenance of the silt barriers selected for the site. In areas where the limits of construction need to be emphasized to operators, construction fence for added visibility will be installed. Orange construction fence will be VISI Perimeter Fence by Conwed Plastic Fencing, or approved equal. The four-foot construction fencing is to be installed using six-foot posts buried at least two feet into the ground spaced six to eight feet apart.

4.2 Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 30 days of disturbance. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation, unless otherwise permitted. All areas to be planted with grass for long-term cover will follow the specifications on Sheet E-1 using the seeding mixture below:

Mixture C	Pounds per Acre	Pounds per 1,000 sf
Tall Fescue	20	0.45
Creeping Red Fescue	20	0.45
Birdsfoot Trefoil	8	0.20
Total	**48**	**1.10**

4.3 Stabilized Construction Entrance/Exit

A temporary gravel construction entrance/exit provides an area where mud can be dislodged from tires before the vehicle leaves the construction site to reduce the amount of mud and sediment transported onto paved municipal and state roads. The stone size for the gravel pad should be between 1- and 2-inch coarse aggregate and the pad itself constructed to a minimum length of 50' for the full width of the access road. The aggregate should be placed at least six inches thick. Plan and profile view details are shown on the Sediment and Erosion Control Detail Plan.

4.4 Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below using seed mixture C. As a general rule, velocities in the swale should not exceed 3.0 feet per second for a vegetated swale although velocities as high as 4.5 FPS are allowed under certain soil conditions.

4.5 Vegetated Buffers

Vegetated buffers are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Vegetated buffers should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.6 Filter Strips

Filter strips are areas of land with natural or planted vegetation designed to receive sheet run-off from upgradient development. These natural areas, preferably wooded, are effective in removing sediment and sediment-laden pollutants from such run-off, although their effectiveness is severely diminished when forced to deal with concentrated flow and must therefore be equipped with a level-spreading device. Filter strips should not have a slope exceeding fifteen percent and have a minimum length of seventy-five feet.

4.7 Environmental Dust Control

Dust will be controlled on the site using multiple Best Management Practices. Mulching and temporary seeding will be the first line of protection to be utilized where problems occur. If dust problems are not solved by these applications, the use of water and calcium chloride can be applied. Calcium chloride will be applied at a rate that will keep the surface moist but not cause pollution.

4.8 Construction Sequence

1. Cut and remove trees in construction areas as directed or required.

2. Construct and/or install temporary and permanent sediment erosion and detention control facilities, as required. Erosion, sediment, and facilities shall be installed and stabilized prior to any earth moving operation, and prior to directing run-off to them.

3. Clear, cut, grub, and dispose of debris in approved facilities.

4. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.

5. Construct the roadway and its associated drainage structures.

6. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required or directed.

7. Daily, or as required, construct temporary berms, drainage ditches, sediment traps, etc. to prevent erosion on the site and prevent any siltation of abutting waters or property.

8. Inspect and maintain all erosion and sediment control measures during construction.

9. Complete permanent seeding and landscaping.

10. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.

11. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.

12. Finish paving all roadway and parking areas.

4.9 Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.

2. Erosion and sediment control measures shall be installed as shown on the plans and at locations as required, or directed by the engineer.

3. All disturbed areas shall be returned to original grades and elevations. Disturbed areas shall be loamed with a minimum of 4" of loam and seeded with not less than 1.10 pound of seed per 1,000 square feet (48 pounds per acre) of area.

4. Silt barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired and sediment deposits shall periodically be removed and properly disposed of.

5. After all disturbed areas have been stabilized, the temporary erosion control measures are to be removed and the area disturbed by the removal smoothed and revegetated.

6. Areas must be seeded and mulched within 5 days of final grading, permanently stabilized within 15 days of final grading, or temporarily stabilized within 30 days of initial disturbance of soil.

4.10 Inspection and Maintenance Schedule

Silt barriers shall be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass.

5.0 CONCLUSION

This proposed site development on Portsmouth Avenue in Stratham, NH will have no adverse effect on the abutting property owners by way of stormwater runoff or siltation. For the abutting properties, the post-construction peak rates of runoff for the site will be lower than the existing conditions for the storm events, as shown in the tables above. The peak rate of runoff towards Portsmouth Avenue is increased and has been reviewed and approved by NHDOT to verify capacity within the existing roadside swale. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of three sediment forebays with bioretention ponds. The Best Management Practices developed by the State of New Hampshire have been utilized in the design of this system and these applications will be enforced throughout the construction process.

An Alteration of Terrain Permit (RSA 485: A-17) is not required for this project due to the area of disturbance being less than 100,000 square feet.

Respectfully Submitted,

BEALS ASSOCIATES, *PLLC*.

Christian O. Smith

Christian O Smith, PE
Principal

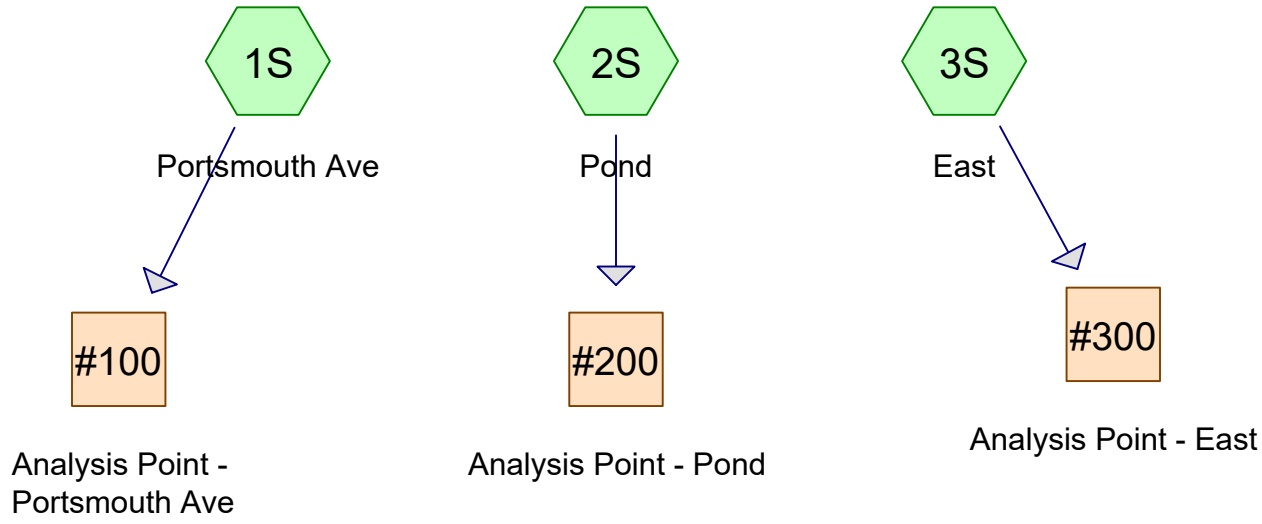
Appendix I

Existing Conditions Analysis

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Summary



Subcat Reach Pond Link

Routing Diagram for NH-1566 Existing
Prepared by Beals Associates, PLLC, Printed 3/5/2026
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.118	61	>75% Grass cover, Good, HSG B (2S, 3S)
1.348	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S)
0.068	80	>75% Grass cover, Good, HSG D (2S)
0.079	96	Gravel surface, HSG C (1S)
0.049	98	Roofs, HSG C (1S, 2S)
0.142	98	Water Surface, HSG D (2S)
1.150	55	Woods, Good, HSG B (2S, 3S)
1.859	70	Woods, Good, HSG C (1S, 2S, 3S)
0.032	77	Woods, Good, HSG D (2S)
4.845	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.268	HSG B	2S, 3S
3.335	HSG C	1S, 2S, 3S
0.242	HSG D	2S
0.000	Other	
4.845		**TOTAL AREA**

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

Subcatchment1S: PortsmouthAve Runoff Area=17,930 sf 3.03% Impervious Runoff Depth=1.37"
Tc=6.0 min CN=WQ Runoff=0.60 cfs 0.047 af

Subcatchment2S: Pond Runoff Area=75,767 sf 10.26% Impervious Runoff Depth=1.18"
Flow Length=317' Tc=10.2 min CN=WQ Runoff=1.89 cfs 0.170 af

Subcatchment3S: East Runoff Area=117,358 sf 0.00% Impervious Runoff Depth=0.59"
Flow Length=326' Tc=10.8 min CN=WQ Runoff=1.18 cfs 0.132 af

Reach#100: AnalysisPoint - PortsmouthAve Inflow=0.60 cfs 0.047 af
Outflow=0.60 cfs 0.047 af

Reach#200: AnalysisPoint - Pond Inflow=1.89 cfs 0.170 af
Outflow=1.89 cfs 0.170 af

Reach#300: AnalysisPoint - East Inflow=1.18 cfs 0.132 af
Outflow=1.18 cfs 0.132 af

Total Runoff Area = 4.845 ac Runoff Volume = 0.350 af Average Runoff Depth = 0.87"
96.06% Pervious = 4.654 ac 3.94% Impervious = 0.191 ac

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

Subcatchment1S: PortsmouthAve Runoff Area=17,930 sf 3.03% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=WQ Runoff=1.21 cfs 0.091 af

Subcatchment2S: Pond Runoff Area=75,767 sf 10.26% Impervious Runoff Depth=2.41"
Flow Length=317' Tc=10.2 min CN=WQ Runoff=4.06 cfs 0.349 af

Subcatchment3S: East Runoff Area=117,358 sf 0.00% Impervious Runoff Depth=1.51"
Flow Length=326' Tc=10.8 min CN=WQ Runoff=3.73 cfs 0.340 af

Reach#100: AnalysisPoint - PortsmouthAve Inflow=1.21 cfs 0.091 af
Outflow=1.21 cfs 0.091 af

Reach#200: AnalysisPoint - Pond Inflow=4.06 cfs 0.349 af
Outflow=4.06 cfs 0.349 af

Reach#300: AnalysisPoint - East Inflow=3.73 cfs 0.340 af
Outflow=3.73 cfs 0.340 af

Total Runoff Area = 4.845 ac Runoff Volume = 0.780 af Average Runoff Depth = 1.93"
96.06% Pervious = 4.654 ac 3.94% Impervious = 0.191 ac

Summary for Subcatchment 1S: Portsmouth Ave

Runoff = 1.21 cfs @ 12.09 hrs, Volume= 0.091 af, Depth= 2.66"
Routed to Reach #100 : Analysis Point - Portsmouth Ave

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
4,302	70	Woods, Good, HSG C
9,664	74	>75% Grass cover, Good, HSG C
3,420	96	Gravel surface, HSG C
544	98	Roofs, HSG C
17,930		Weighted Average
17,386		96.97% Pervious Area
544		3.03% Impervious Area

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

Summary for Subcatchment 2S: Pond

Runoff = 4.06 cfs @ 12.15 hrs, Volume= 0.349 af, Depth= 2.41"
Routed to Reach #200 : Analysis Point - Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
834	55	Woods, Good, HSG B
4,550	61	>75% Grass cover, Good, HSG B
12,043	70	Woods, Good, HSG C
46,212	74	>75% Grass cover, Good, HSG C
1,585	98	Roofs, HSG C
1,399	77	Woods, Good, HSG D
2,959	80	>75% Grass cover, Good, HSG D
6,185	98	Water Surface, HSG D
75,767		Weighted Average
67,997		89.74% Pervious Area
7,770		10.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0860	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.92"
2.6	248	0.0520	1.60		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.4	19	0.0320	0.89		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.2	317	Total			

Summary for Subcatchment 3S: East

Runoff = 3.73 cfs @ 12.16 hrs, Volume= 0.340 af, Depth= 1.51"
Routed to Reach #300 : Analysis Point - East

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
49,277	55	Woods, Good, HSG B
579	61	>75% Grass cover, Good, HSG B
64,644	70	Woods, Good, HSG C
2,858	74	>75% Grass cover, Good, HSG C
0	77	Woods, Good, HSG D
117,358		Weighted Average
117,358		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	50	0.0960	0.12		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.92"
3.9	276	0.0550	1.17		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	326	Total			

Summary for Reach #100: Analysis Point - Portsmouth Ave

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

Inflow Area = 0.412 ac, 3.03% Impervious, Inflow Depth = 2.66" for 10-YR event
Inflow = 1.21 cfs @ 12.09 hrs, Volume= 0.091 af
Outflow = 1.21 cfs @ 12.09 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach #200: Analysis Point - Pond

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

Inflow Area = 1.739 ac, 10.26% Impervious, Inflow Depth = 2.41" for 10-YR event
Inflow = 4.06 cfs @ 12.15 hrs, Volume= 0.349 af
Outflow = 4.06 cfs @ 12.15 hrs, Volume= 0.349 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach #300: Analysis Point - East

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

Inflow Area = 2.694 ac, 0.00% Impervious, Inflow Depth = 1.51" for 10-YR event
Inflow = 3.73 cfs @ 12.16 hrs, Volume= 0.340 af
Outflow = 3.73 cfs @ 12.16 hrs, Volume= 0.340 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment1S: PortsmouthAve Runoff Area=17,930 sf 3.03% Impervious Runoff Depth=3.78"
Tc=6.0 min CN=WQ Runoff=1.72 cfs 0.130 af

Subcatchment2S: Pond Runoff Area=75,767 sf 10.26% Impervious Runoff Depth=3.49"
Flow Length=317' Tc=10.2 min CN=WQ Runoff=5.95 cfs 0.506 af

Subcatchment3S: East Runoff Area=117,358 sf 0.00% Impervious Runoff Depth=2.40"
Flow Length=326' Tc=10.8 min CN=WQ Runoff=6.19 cfs 0.540 af

Reach#100: AnalysisPoint - PortsmouthAve Inflow=1.72 cfs 0.130 af
Outflow=1.72 cfs 0.130 af

Reach#200: AnalysisPoint - Pond Inflow=5.95 cfs 0.506 af
Outflow=5.95 cfs 0.506 af

Reach#300: AnalysisPoint - East Inflow=6.19 cfs 0.540 af
Outflow=6.19 cfs 0.540 af

Total Runoff Area = 4.845 ac Runoff Volume = 1.175 af Average Runoff Depth = 2.91"
96.06% Pervious = 4.654 ac 3.94% Impervious = 0.191 ac

Appendix II

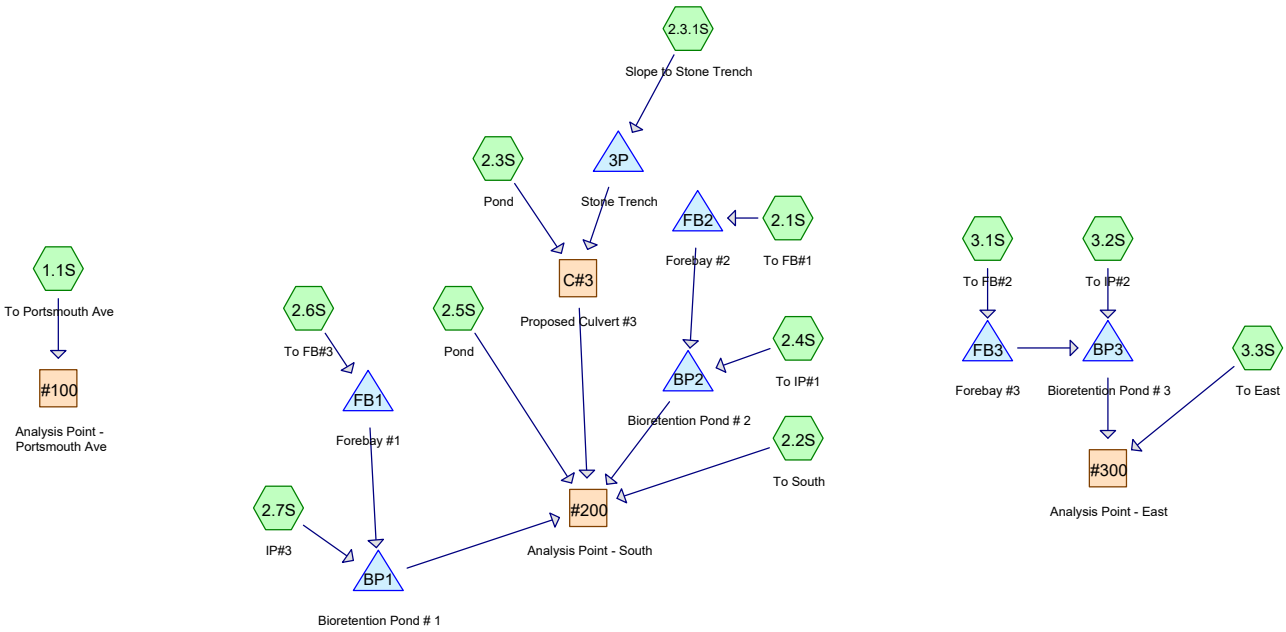
Proposed Conditions Analysis

2-Year 24-Hour Summary

10-Year 24-Hour Complete

25-Year 24-Hour Summary

50-Year 24-Hour Summary (Ponds Only)



Subcat Reach Pond Link

Routing Diagram for NH-1566 Proposed Bio
Prepared by Beals Associates, PLLC, Printed 10/21/2026
HydroCAD® 10.20-9a s/n 01754 © 2026 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.330	61	>75% Grass cover, Good, HSG B (2.5S, 2.7S, 3.1S, 3.2S, 3.3S)
1.136	74	>75% Grass cover, Good, HSG C (1.1S, 2.1S, 2.2S, 2.3.1S, 2.3S, 2.4S, 2.5S, 2.6S, 2.7S, 3.1S, 3.3S)
0.068	80	>75% Grass cover, Good, HSG D (2.5S)
0.006	96	Gravel surface, HSG B (3.1S)
0.057	96	Gravel surface, HSG C (1.1S, 2.1S, 2.3S, 2.5S, 3.1S)
0.018	98	Paved parking, HSG B (3.1S)
0.471	98	Paved parking, HSG C (1.1S, 2.1S, 2.6S, 3.1S)
0.017	98	Roofs, HSG B (3.1S, 3.3S)
0.216	98	Roofs, HSG C (1.1S, 2.1S, 2.2S, 2.4S, 2.6S, 2.7S, 3.1S, 3.3S)
0.142	98	Water Surface, HSG D (2.5S)
0.897	55	Woods, Good, HSG B (2.5S, 3.3S)
1.455	70	Woods, Good, HSG C (1.1S, 2.2S, 2.3.1S, 2.3S, 2.5S, 3.1S, 3.3S)
0.032	77	Woods, Good, HSG D (2.5S)
4.845	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1.268	HSG B	2.5S, 2.7S, 3.1S, 3.2S, 3.3S
3.335	HSG C	1.1S, 2.1S, 2.2S, 2.3.1S, 2.3S, 2.4S, 2.5S, 2.6S, 2.7S, 3.1S, 3.3S
0.242	HSG D	2.5S
0.000	Other	
4.845		**TOTAL AREA**

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

Subcatchment1.1S: To PortsmouthAve Runoff Area=28,657 sf 29.90% Impervious Runoff Depth=1.62"
Tc=6.0 min CN=WQ Runoff=1.11 cfs 0.089 af

Subcatchment2.1S: To FB#1 Runoff Area=9,912 sf 69.21% Impervious Runoff Depth=2.49"
Tc=6.0 min CN=WQ Runoff=0.58 cfs 0.047 af

Subcatchment2.2S: To South Runoff Area=9,308 sf 15.48% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=WQ Runoff=0.30 cfs 0.023 af

Subcatchment2.3.1S: Slope to Stone Trench Runoff Area=2,433 sf 0.00% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=WQ Runoff=0.06 cfs 0.005 af

Subcatchment2.3S: Pond Runoff Area=2,165 sf 0.00% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=WQ Runoff=0.05 cfs 0.004 af

Subcatchment2.4S: To IP#1 Runoff Area=3,541 sf 20.22% Impervious Runoff Depth=1.43"
Tc=6.0 min CN=WQ Runoff=0.12 cfs 0.010 af

Subcatchment2.5S: Pond Runoff Area=29,881 sf 20.70% Impervious Runoff Depth=1.39"
Tc=6.0 min CN=WQ Runoff=0.99 cfs 0.079 af

Subcatchment2.6S: To FB#3 Runoff Area=9,021 sf 70.40% Impervious Runoff Depth=2.40"
Tc=6.0 min CN=WQ Runoff=0.51 cfs 0.041 af

Subcatchment2.7S: IP#3 Runoff Area=3,145 sf 21.59% Impervious Runoff Depth=1.35"
Tc=6.0 min CN=WQ Runoff=0.10 cfs 0.008 af

Subcatchment3.1S: To FB#2 Runoff Area=10,395 sf 51.09% Impervious Runoff Depth=2.00"
Tc=6.0 min CN=WQ Runoff=0.48 cfs 0.040 af

Subcatchment3.2S: To IP#2 Runoff Area=1,909 sf 0.00% Impervious Runoff Depth=0.44"
Tc=6.0 min CN=WQ Runoff=0.01 cfs 0.002 af

Subcatchment3.3S: To East Runoff Area=100,679 sf 1.54% Impervious Runoff Depth=0.63"
Flow Length=214' Tc=10.8 min CN=WQ Runoff=1.10 cfs 0.121 af

Reach#100: AnalysisPoint - PortsmouthAve Inflow=1.11 cfs 0.089 af
Outflow=1.11 cfs 0.089 af

Reach#200: AnalysisPoint - South Inflow=1.37 cfs 0.112 af
Outflow=1.37 cfs 0.112 af

Reach#300: AnalysisPoint - East Inflow=1.10 cfs 0.121 af
Outflow=1.10 cfs 0.121 af

ReachC#3: ProposedCulvert#3 Avg. Flow Depth=0.10' Max Vel=2.02 fps Inflow=0.08 cfs 0.009 af
12.0" Round Pipe n=0.012 L=38.0' S=0.0105 '/' Capacity=3.96 cfs Outflow=0.08 cfs 0.009 af

Pond 3P: Stone Trench Peak Elev=101.13' Storage=33 cf Inflow=0.06 cfs 0.005 af
6.0" Round Culvert n=0.010 L=200.0' S=0.0050 '/' Outflow=0.04 cfs 0.005 af

Pond BP1: BioretentionPond # 1 Peak Elev=92.05' Storage=0 cf Inflow=0.61 cfs 0.047 af
Discarded=0.61 cfs 0.047 af Primary=0.00 cfs 0.000 af Outflow=0.61 cfs 0.047 af

Pond BP2: BioretentionPond # 2 Peak Elev=95.93' Storage=241 cf Inflow=0.70 cfs 0.051 af
Discarded=0.30 cfs 0.051 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.051 af

Pond BP3: BioretentionPond # 3 Peak Elev=96.75' Storage=0 cf Inflow=0.49 cfs 0.035 af
Discarded=0.49 cfs 0.035 af Primary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.035 af

Pond FB1: Forebay#1 Peak Elev=94.61' Storage=140 cf Inflow=0.51 cfs 0.041 af
Outflow=0.51 cfs 0.039 af

Pond FB2: Forebay#2 Peak Elev=97.62' Storage=289 cf Inflow=0.58 cfs 0.047 af
Outflow=0.58 cfs 0.041 af

Pond FB3: Forebay#3 Peak Elev=99.10' Storage=294 cf Inflow=0.48 cfs 0.040 af
Outflow=0.48 cfs 0.034 af

Total Runoff Area = 4.845 ac Runoff Volume = 0.469 af Average Runoff Depth = 1.16"
82.16% Pervious = 3.980 ac 17.84% Impervious = 0.865 ac

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

Subcatchment1.1S: To PortsmouthAve Runoff Area=28,657 sf 29.90% Impervious Runoff Depth=2.96"
Tc=6.0 min CN=WQ Runoff=2.08 cfs 0.162 af

Subcatchment2.1S: To FB#1 Runoff Area=9,912 sf 69.21% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=WQ Runoff=0.94 cfs 0.077 af

Subcatchment2.2S: To South Runoff Area=9,308 sf 15.48% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=WQ Runoff=0.61 cfs 0.046 af

Subcatchment2.3.1S: Slope to Stone Trench Runoff Area=2,433 sf 0.00% Impervious Runoff Depth=2.22"
Tc=6.0 min CN=WQ Runoff=0.14 cfs 0.010 af

Subcatchment2.3S: Pond Runoff Area=2,165 sf 0.00% Impervious Runoff Depth=2.15"
Tc=6.0 min CN=WQ Runoff=0.12 cfs 0.009 af

Subcatchment2.4S: To IP#1 Runoff Area=3,541 sf 20.22% Impervious Runoff Depth=2.74"
Tc=6.0 min CN=WQ Runoff=0.24 cfs 0.019 af

Subcatchment2.5S: Pond Runoff Area=29,881 sf 20.70% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=WQ Runoff=1.97 cfs 0.152 af

Subcatchment2.6S: To FB#3 Runoff Area=9,021 sf 70.40% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=WQ Runoff=0.84 cfs 0.068 af

Subcatchment2.7S: IP#3 Runoff Area=3,145 sf 21.59% Impervious Runoff Depth=2.60"
Tc=6.0 min CN=WQ Runoff=0.20 cfs 0.016 af

Subcatchment3.1S: To FB#2 Runoff Area=10,395 sf 51.09% Impervious Runoff Depth=3.39"
Tc=6.0 min CN=WQ Runoff=0.83 cfs 0.067 af

Subcatchment3.2S: To IP#2 Runoff Area=1,909 sf 0.00% Impervious Runoff Depth=1.29"
Tc=6.0 min CN=WQ Runoff=0.06 cfs 0.005 af

Subcatchment3.3S: To East Runoff Area=100,679 sf 1.54% Impervious Runoff Depth=1.57"
Flow Length=214' Tc=10.8 min CN=WQ Runoff=3.31 cfs 0.302 af

Reach#100: AnalysisPoint - PortsmouthAve Inflow=2.08 cfs 0.162 af
Outflow=2.08 cfs 0.162 af

Reach#200: AnalysisPoint - South Inflow=2.80 cfs 0.217 af
Outflow=2.80 cfs 0.217 af

Reach#300: AnalysisPoint - East Inflow=3.31 cfs 0.302 af
Outflow=3.31 cfs 0.302 af

ReachC#3: ProposedCulvert#3 Avg. Flow Depth=0.16' Max Vel=2.71 fps Inflow=0.22 cfs 0.019 af
12.0" Round Pipe n=0.012 L=38.0' S=0.0105 '/' Capacity=3.96 cfs Outflow=0.22 cfs 0.019 af

Pond 3P: Stone Trench Peak Elev=101.22' Storage=56 cf Inflow=0.14 cfs 0.010 af
6.0" Round Culvert n=0.010 L=200.0' S=0.0050 '/' Outflow=0.12 cfs 0.010 af

Pond BP1: BioretentionPond # 1 Peak Elev=92.05' Storage=0 cf Inflow=1.04 cfs 0.081 af
Discarded=1.04 cfs 0.081 af Primary=0.00 cfs 0.000 af Outflow=1.04 cfs 0.081 af

Pond BP2: BioretentionPond # 2 Peak Elev=97.45' Storage=792 cf Inflow=1.18 cfs 0.090 af
Discarded=0.30 cfs 0.090 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.090 af

Pond BP3: BioretentionPond # 3 Peak Elev=96.75' Storage=0 cf Inflow=0.88 cfs 0.066 af
Discarded=0.88 cfs 0.066 af Primary=0.00 cfs 0.000 af Outflow=0.88 cfs 0.066 af

Pond FB1: Forebay#1 Peak Elev=94.65' Storage=148 cf Inflow=0.84 cfs 0.068 af
Outflow=0.84 cfs 0.065 af

Pond FB2: Forebay#2 Peak Elev=97.66' Storage=305 cf Inflow=0.94 cfs 0.077 af
Outflow=0.94 cfs 0.071 af

Pond FB3: Forebay#3 Peak Elev=99.15' Storage=309 cf Inflow=0.83 cfs 0.067 af
Outflow=0.83 cfs 0.061 af

Total Runoff Area = 4.845 ac Runoff Volume = 0.933 af Average Runoff Depth = 2.31"
82.16% Pervious = 3.980 ac 17.84% Impervious = 0.865 ac

Summary for Subcatchment 1.1S: To Portsmouth Ave

Runoff = 2.08 cfs @ 12.09 hrs, Volume= 0.162 af, Depth= 2.96"
Routed to Reach #100 : Analysis Point - Portsmouth Ave

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
7,406	70	Woods, Good, HSG C
11,720	74	>75% Grass cover, Good, HSG C
6,133	98	Paved parking, HSG C
2,436	98	Roofs, HSG C
962	96	Gravel surface, HSG C
28,657		Weighted Average
20,088		70.10% Pervious Area
8,569		29.90% Impervious Area

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

Summary for Subcatchment 2.1S: To FB#1

Runoff = 0.94 cfs @ 12.09 hrs, Volume= 0.077 af, Depth= 4.05"
Routed to Pond FB2 : Forebay #2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
2,369	74	>75% Grass cover, Good, HSG C
5,388	98	Paved parking, HSG C
1,472	98	Roofs, HSG C
683	96	Gravel surface, HSG C
9,912		Weighted Average
3,052		30.79% Pervious Area
6,860		69.21% Impervious Area

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

Summary for Subcatchment 2.2S: To South

Runoff = 0.61 cfs @ 12.09 hrs, Volume= 0.046 af, Depth= 2.59"
Routed to Reach #200 : Analysis Point - South

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
989	70	Woods, Good, HSG C
6,878	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
1,441	98	Roofs, HSG C
9,308		Weighted Average
7,867		84.52% Pervious Area
1,441		15.48% Impervious Area

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

Summary for Subcatchment 2.3.1S: Slope to Stone Trench

Runoff = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af, Depth= 2.22"
Routed to Pond 3P : Stone Trench

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
0	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
327	70	Woods, Good, HSG C
2,106	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
0	98	Roofs, HSG C
0	77	Woods, Good, HSG D
0	80	>75% Grass cover, Good, HSG D
0	98	Water Surface, HSG D
2,433		Weighted Average
2,433		100.00% Pervious Area

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

Summary for Subcatchment 2.3S: Pond

Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 2.15"
Routed to Reach C#3 : Proposed Culvert #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
0	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
1,310	70	Woods, Good, HSG C
771	74	>75% Grass cover, Good, HSG C
84	96	Gravel surface, HSG C
0	98	Roofs, HSG C
0	77	Woods, Good, HSG D
0	80	>75% Grass cover, Good, HSG D
0	98	Water Surface, HSG D
2,165		Weighted Average
2,165		100.00% Pervious Area

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

Summary for Subcatchment 2.4S: To IP#1

Runoff = 0.24 cfs @ 12.09 hrs, Volume= 0.019 af, Depth= 2.74"
Routed to Pond BP2 : Bioretention Pond # 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
0	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
0	70	Woods, Good, HSG C
2,825	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
716	98	Roofs, HSG C
0	77	Woods, Good, HSG D
0	80	>75% Grass cover, Good, HSG D
0	98	Water Surface, HSG D
3,541		Weighted Average
2,825		79.78% Pervious Area
716		20.22% Impervious Area

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

Summary for Subcatchment 2.5S: Pond

Runoff = 1.97 cfs @ 12.09 hrs, Volume= 0.152 af, Depth= 2.66"
Routed to Reach #200 : Analysis Point - South

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
834	55	Woods, Good, HSG B
3,993	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
724	70	Woods, Good, HSG C
13,530	74	>75% Grass cover, Good, HSG C
257	96	Gravel surface, HSG C
0	98	Roofs, HSG C
1,399	77	Woods, Good, HSG D
2,959	80	>75% Grass cover, Good, HSG D
6,185	98	Water Surface, HSG D
29,881		Weighted Average
23,696		79.30% Pervious Area
6,185		20.70% Impervious Area

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

Summary for Subcatchment 2.6S: To FB#3

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.068 af, Depth= 3.93"
Routed to Pond FB1 : Forebay #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
0	61	>75% Grass cover, Good, HSG B
0	98	Roofs, HSG B
0	70	Woods, Good, HSG C
2,670	74	>75% Grass cover, Good, HSG C
5,845	98	Paved parking, HSG C
506	98	Roofs, HSG C
9,021		Weighted Average
2,670		29.60% Pervious Area
6,351		70.40% Impervious Area

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

Summary for Subcatchment 2.7S: IP#3

Runoff = 0.20 cfs @ 12.09 hrs, Volume= 0.016 af, Depth= 2.60"
Routed to Pond BP1 : Bioretention Pond # 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
556	61	>75% Grass cover, Good, HSG B
0	98	Paved parking, HSG B
0	70	Woods, Good, HSG C
1,910	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
679	98	Roofs, HSG C
0	77	Woods, Good, HSG D
0	80	>75% Grass cover, Good, HSG D
0	98	Water Surface, HSG D
3,145		Weighted Average
2,466		78.41% Pervious Area
679		21.59% Impervious Area

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

Summary for Subcatchment 3.1S: To FB#2

Runoff = 0.83 cfs @ 12.09 hrs, Volume= 0.067 af, Depth= 3.39"
Routed to Pond FB3 : Forebay #3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
2,283	61	>75% Grass cover, Good, HSG B
800	98	Paved parking, HSG B
266	96	Gravel surface, HSG B
384	98	Roofs, HSG B
886	70	Woods, Good, HSG C
1,166	74	>75% Grass cover, Good, HSG C
3,164	98	Paved parking, HSG C
483	96	Gravel surface, HSG C
963	98	Roofs, HSG C
10,395		Weighted Average
5,084		48.91% Pervious Area
5,311		51.09% Impervious Area

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

Summary for Subcatchment 3.2S: To IP#2

Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 1.29"
Routed to Pond BP3 : Bioretention Pond # 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
0	55	Woods, Good, HSG B
1,909	61	>75% Grass cover, Good, HSG B
0	70	Woods, Good, HSG C
0	74	>75% Grass cover, Good, HSG C
0	77	Woods, Good, HSG D
1,909		Weighted Average
1,909		100.00% Pervious Area

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

Summary for Subcatchment 3.3S: To East

Runoff = 3.31 cfs @ 12.16 hrs, Volume= 0.302 af, Depth= 1.57"
Routed to Reach #300 : Analysis Point - East

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YR Rainfall=4.87"

Area (sf)	CN	Description
38,226	55	Woods, Good, HSG B
5,630	61	>75% Grass cover, Good, HSG B
358	98	Roofs, HSG B
51,747	70	Woods, Good, HSG C
3,527	74	>75% Grass cover, Good, HSG C
0	98	Paved parking, HSG C
1,191	98	Roofs, HSG C
100,679		Weighted Average
99,130		98.46% Pervious Area
1,549		1.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0680	0.11		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 2.92"
2.9	164	0.0365	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
10.8	214	Total			

Summary for Reach #100: Analysis Point - Portsmouth Ave

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

Inflow Area = 0.658 ac, 29.90% Impervious, Inflow Depth = 2.96" for 10-YR event
Inflow = 2.08 cfs @ 12.09 hrs, Volume= 0.162 af
Outflow = 2.08 cfs @ 12.09 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach #200: Analysis Point - South

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

Inflow Area = 1.593 ac, 32.03% Impervious, Inflow Depth = 1.64" for 10-YR event
Inflow = 2.80 cfs @ 12.09 hrs, Volume= 0.217 af
Outflow = 2.80 cfs @ 12.09 hrs, Volume= 0.217 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach #300: Analysis Point - East

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

Inflow Area = 2.594 ac, 6.07% Impervious, Inflow Depth = 1.40" for 10-YR event
Inflow = 3.31 cfs @ 12.16 hrs, Volume= 0.302 af
Outflow = 3.31 cfs @ 12.16 hrs, Volume= 0.302 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach C#3: Proposed Culvert #3

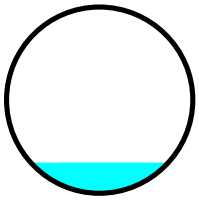
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 0.106 ac, 0.00% Impervious, Inflow Depth = 2.19" for 10-YR event
Inflow = 0.22 cfs @ 12.12 hrs, Volume= 0.019 af
Outflow = 0.22 cfs @ 12.12 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.2 min
Routed to Reach #200 : Analysis Point - South

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Max. Velocity= 2.71 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 0.8 min

Peak Storage= 3 cf @ 12.12 hrs
Average Depth at Peak Storage= 0.16' , Surface Width= 0.74'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 3.96 cfs

12.0" Round Pipe
n= 0.012 Concrete pipe, finished
Length= 38.0' Slope= 0.0105 '/'
Inlet Invert= 96.20', Outlet Invert= 95.80'



Summary for Pond 3P: Stone Trench

Inflow Area = 0.056 ac, 0.00% Impervious, Inflow Depth = 2.22" for 10-YR event
Inflow = 0.14 cfs @ 12.10 hrs, Volume= 0.010 af
Outflow = 0.12 cfs @ 12.16 hrs, Volume= 0.010 af, Atten= 19%, Lag= 3.9 min
Primary = 0.12 cfs @ 12.16 hrs, Volume= 0.010 af
Routed to Reach C#3 : Proposed Culvert #3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 101.22'@ 12.16 hrs Surf.Area= 644 sf Storage= 56 cf
Flood Elev= 104.00' Surf.Area= 644 sf Storage= 812 cf

Plug-Flow detention time=26.9 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time=27.7 min (867.7 - 840.0)

Volume	Invert	Avail.Storage	Storage Description
#1	101.00'	773 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
#2	102.00'	39 cf	**6.0" Round Pipe Storage** L= 200.0' S= 0.0050 '/'
		812 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
101.00	644	0.0	0	0	644
104.00	644	40.0	773	773	914

Device	Routing	Invert	Outlet Devices
#1	Primary	101.00'	**6.0" Round Culvert** L= 200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 101.00' / 100.00' S= 0.0050 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.11 cfs @ 12.16 hrs HW=101.22' TW=96.36' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.11 cfs @ 2.07 fps)

Summary for Pond BP1: Bioretention Pond # 1

Inflow Area = 0.279 ac, 57.78% Impervious, Inflow Depth = 3.47" for 10-YR event
Inflow = 1.04 cfs @ 12.10 hrs, Volume= 0.081 af
Outflow = 1.04 cfs @ 12.10 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.0 min
Discarded = 1.04 cfs @ 12.10 hrs, Volume= 0.081 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach #200 : Analysis Point - South

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 92.05' @ 12.10 hrs Surf.Area= 472 sf Storage= 0 cf
Flood Elev= 95.00' Surf.Area= 833 sf Storage= 950 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (789.8 - 789.8)

Volume	Invert	Avail.Storage	Storage Description
#1	92.05'	950 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
92.05	472	0.0	0	0
93.05	472	40.0	189	189
94.05	472	30.0	142	330
95.00	833	100.0	620	950

Device	Routing	Invert	Outlet Devices
#1	Primary	94.75'	**6.0' long x 4.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68

2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2 Discarded 92.05' **1.88 cfs Exfiltration at all elevations**

Discarded OutFlow Max=1.88 cfs @ 12.10 hrs HW=92.05' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 1.88 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=92.05' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond BP2: Bioretention Pond # 2

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=104)

Inflow Area = 0.309 ac, 56.31% Impervious, Inflow Depth = 3.48" for 10-YR event
Inflow = 1.18 cfs @ 12.10 hrs, Volume= 0.090 af
Outflow = 0.30 cfs @ 11.85 hrs, Volume= 0.090 af, Atten= 75%, Lag= 0.0 min
Discarded = 0.30 cfs @ 11.85 hrs, Volume= 0.090 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach #200 : Analysis Point - South

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 97.45' @ 12.48 hrs Surf.Area= 936 sf Storage= 792 cf
Flood Elev= 98.00' Surf.Area= 1,246 sf Storage= 1,395 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 13.3 min (811.8 - 798.5)

Volume	Invert	Avail.Storage	Storage Description
#1	95.15'	1,395 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
95.15	769	0.0	0	0
96.15	769	40.0	308	308
97.15	769	30.0	231	538
98.00	1,246	100.0	856	1,395

Device	Routing	Invert	Outlet Devices
#1	Primary	97.75'	**6.0' long x 4.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	95.15'	**0.30 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.30 cfs @ 11.85 hrs HW=95.19' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=95.15' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond BP3: Bioretention Pond # 3

Inflow Area = 0.282 ac, 43.16% Impervious, Inflow Depth = 2.81" for 10-YR event
Inflow = 0.88 cfs @ 12.10 hrs, Volume= 0.066 af
Outflow = 0.88 cfs @ 12.10 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.88 cfs @ 12.10 hrs, Volume= 0.066 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Reach #300 : Analysis Point - East

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 96.75' @ 0.00 hrs Surf.Area= 991 sf Storage= 0 cf
Flood Elev= 99.50' Surf.Area= 1,349 sf Storage= 1,571 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (814.9 - 814.9)

Volume	Invert	Avail.Storage	Storage Description
#1	96.75'	1,571 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.75	991	0.0	0	0
97.75	991	40.0	396	396
98.75	991	30.0	297	694
99.50	1,349	100.0	878	1,571

Device	Routing	Invert	Outlet Devices
#1	Primary	99.25'	**6.0' long x 4.0' 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 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Discarded	96.75'	**3.00 cfs Exfiltration at all elevations**

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=96.75' (Free Discharge)
↑—**2=Exfiltration** (Passes 0.00 cfs of 3.00 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=96.75' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB1: Forebay #1

Inflow Area = 0.207 ac, 70.40% Impervious, Inflow Depth = 3.93" for 10-YR event
Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.068 af
Outflow = 0.84 cfs @ 12.10 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.5 min
Primary = 0.84 cfs @ 12.10 hrs, Volume= 0.065 af
Routed to Pond BP1 : Bioretention Pond # 1

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

Peak Elev= 94.65' @ 12.10 hrs Surf.Area= 197 sf Storage= 148 cf
Flood Elev= 95.00' Surf.Area= 262 sf Storage= 228 cf

Plug-Flow detention time=46.0 min calculated for 0.065 af (96% of inflow)
Center-of-Mass det. time=21.8 min (785.6 - 763.8)

Volume	Invert	Avail.Storage	Storage Description
#1	93.00'	228 cf	**Custom Stage Data (Conid)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
93.00	17	0	0	17
94.00	101	53	53	105
95.00	262	175	228	272

Device	Routing	Invert	Outlet Devices
#1	Primary	94.50'	**6.0' long x 4.0' 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 4.00 4.50 5.00 5.50
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.83 cfs @ 12.10 hrs HW=94.65' TW=92.05' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.83 cfs @ 0.92 fps)

Summary for Pond FB2: Forebay #2

Inflow Area = 0.228 ac, 69.21% Impervious, Inflow Depth = 4.05" for 10-YR event
Inflow = 0.94 cfs @ 12.09 hrs, Volume= 0.077 af
Outflow = 0.94 cfs @ 12.10 hrs, Volume= 0.071 af, Atten= 0%, Lag= 0.7 min
Primary = 0.94 cfs @ 12.10 hrs, Volume= 0.071 af
Routed to Pond BP2 : Bioretention Pond # 2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 97.66' @ 12.10 hrs Surf.Area= 353 sf Storage= 305 cf
Flood Elev= 98.00' Surf.Area= 444 sf Storage= 438 cf

Plug-Flow detention time=74.6 min calculated for 0.071 af (92% of inflow)
Center-of-Mass det. time=34.5 min (796.1 - 761.6)

Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	438 cf	**Custom Stage Data (Conid)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
96.00	56	0	0	56
98.00	444	438	438	457

Device	Routing	Invert	Outlet Devices
#1	Primary	97.50'	**6.0' long x 4.0' 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 4.00 4.50 5.00 5.50
Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68
2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.94 cfs @ 12.10 hrs HW=97.66' TW=96.40' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.94 cfs @ 0.96 fps)

Summary for Pond FB3: Forebay #3

Inflow Area = 0.239 ac, 51.09% Impervious, Inflow Depth = 3.39" for 10-YR event
Inflow = 0.83 cfs @ 12.09 hrs, Volume= 0.067 af
Outflow = 0.83 cfs @ 12.10 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.7 min
Primary = 0.83 cfs @ 12.10 hrs, Volume= 0.061 af
Routed to Pond BP3 : Bioretention Pond # 3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 99.15' @ 12.10 hrs Surf.Area= 333 sf Storage= 309 cf
Flood Elev= 99.50' Surf.Area= 412 sf Storage= 439 cf

Plug-Flow detention time=84.7 min calculated for 0.061 af (91% of inflow)
Center-of-Mass det. time=38.3 min (810.3 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	439 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
97.50	69	0	0	69
98.00	133	50	50	135
99.50	412	390	439	427

Device	Routing	Invert	Outlet Devices
#1	Primary	99.00'	**6.0' long x 4.0' 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 4.00 4.50 5.00 5.50
			Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68
			2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.82 cfs @ 12.10 hrs HW=99.15' TW=96.75' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.82 cfs @ 0.92 fps)

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

Subcatchment1.1S: To PortsmouthAve Runoff Area=28,657 sf 29.90% Impervious Runoff Depth=4.10"
Tc=6.0 min CN=WQ Runoff=2.90 cfs 0.225 af

Subcatchment2.1S: To FB#1 Runoff Area=9,912 sf 69.21% Impervious Runoff Depth=5.31"
Tc=6.0 min CN=WQ Runoff=1.23 cfs 0.101 af

Subcatchment2.2S: To South Runoff Area=9,308 sf 15.48% Impervious Runoff Depth=3.71"
Tc=6.0 min CN=WQ Runoff=0.88 cfs 0.066 af

Subcatchment2.3.1S: Slope to Stone Trench Runoff Area=2,433 sf 0.00% Impervious Runoff Depth=3.29"
Tc=6.0 min CN=WQ Runoff=0.21 cfs 0.015 af

Subcatchment2.3S: Pond Runoff Area=2,165 sf 0.00% Impervious Runoff Depth=3.20"
Tc=6.0 min CN=WQ Runoff=0.18 cfs 0.013 af

Subcatchment2.4S: To IP#1 Runoff Area=3,541 sf 20.22% Impervious Runoff Depth=3.87"
Tc=6.0 min CN=WQ Runoff=0.35 cfs 0.026 af

Subcatchment2.5S: Pond Runoff Area=29,881 sf 20.70% Impervious Runoff Depth=3.76"
Tc=6.0 min CN=WQ Runoff=2.81 cfs 0.215 af

Subcatchment2.6S: To FB#3 Runoff Area=9,021 sf 70.40% Impervious Runoff Depth=5.18"
Tc=6.0 min CN=WQ Runoff=1.10 cfs 0.089 af

Subcatchment2.7S: IP#3 Runoff Area=3,145 sf 21.59% Impervious Runoff Depth=3.69"
Tc=6.0 min CN=WQ Runoff=0.29 cfs 0.022 af

Subcatchment3.1S: To FB#2 Runoff Area=10,395 sf 51.09% Impervious Runoff Depth=4.55"
Tc=6.0 min CN=WQ Runoff=1.12 cfs 0.090 af

Subcatchment3.2S: To IP#2 Runoff Area=1,909 sf 0.00% Impervious Runoff Depth=2.13"
Tc=6.0 min CN=WQ Runoff=0.10 cfs 0.008 af

Subcatchment3.3S: To East Runoff Area=100,679 sf 1.54% Impervious Runoff Depth=2.47"
Flow Length=214' Tc=10.8 min CN=WQ Runoff=5.43 cfs 0.475 af

Reach#100: AnalysisPoint - PortsmouthAve Inflow=2.90 cfs 0.225 af
Outflow=2.90 cfs 0.225 af

Reach#200: AnalysisPoint - South Inflow=4.03 cfs 0.313 af
Outflow=4.03 cfs 0.313 af

Reach#300: AnalysisPoint - East Inflow=5.43 cfs 0.475 af
Outflow=5.43 cfs 0.475 af

ReachC#3: ProposedCulvert#3 Avg. Flow Depth=0.20' Max Vel=3.09 fps Inflow=0.35 cfs 0.029 af
12.0" Round Pipe n=0.012 L=38.0' S=0.0105 '/' Capacity=3.96 cfs Outflow=0.35 cfs 0.029 af

Pond 3P: Stone Trench Peak Elev=101.28' Storage=71 cf Inflow=0.21 cfs 0.015 af
6.0" Round Culvert n=0.010 L=200.0' S=0.0050 '/' Outflow=0.18 cfs 0.015 af

Pond BP1: BioretentionPond # 1 Peak Elev=92.05' Storage=0 cf Inflow=1.39 cfs 0.109 af
Discarded=1.39 cfs 0.109 af Primary=0.00 cfs 0.000 af Outflow=1.39 cfs 0.109 af

Pond BP2: BioretentionPond # 2 Peak Elev=97.80' Storage=1,158 cf Inflow=1.58 cfs 0.121 af
Discarded=0.30 cfs 0.119 af Primary=0.16 cfs 0.003 af Outflow=0.46 cfs 0.122 af

Pond BP3: BioretentionPond # 3 Peak Elev=96.75' Storage=0 cf Inflow=1.22 cfs 0.092 af
Discarded=1.22 cfs 0.092 af Primary=0.00 cfs 0.000 af Outflow=1.22 cfs 0.092 af

Pond FB1: Forebay#1 Peak Elev=94.68' Storage=155 cf Inflow=1.10 cfs 0.089 af
Outflow=1.10 cfs 0.087 af

Pond FB2: Forebay#2 Peak Elev=97.80' Storage=356 cf Inflow=1.23 cfs 0.101 af
Outflow=1.23 cfs 0.095 af

Pond FB3: Forebay#3 Peak Elev=99.18' Storage=320 cf Inflow=1.12 cfs 0.090 af
Outflow=1.11 cfs 0.084 af

Total Runoff Area = 4.845 ac Runoff Volume = 1.346 af Average Runoff Depth = 3.33"
82.16% Pervious = 3.980 ac 17.84% Impervious = 0.865 ac

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

Pond BP1: BioretentionPond # 1 Peak Elev=92.05' Storage=0 cf Inflow=1.73 cfs 0.136 af
Discarded=1.72 cfs 0.136 af Primary=0.00 cfs 0.000 af Outflow=1.72 cfs 0.136 af

Pond BP2: BioretentionPond # 2 Peak Elev=97.87' Storage=1,236 cf Inflow=1.95 cfs 0.151 af
Discarded=0.30 cfs 0.136 af Primary=0.58 cfs 0.015 af Outflow=0.88 cfs 0.151 af

Pond BP3: BioretentionPond # 3 Peak Elev=96.75' Storage=0 cf Inflow=1.54 cfs 0.118 af
Discarded=1.54 cfs 0.118 af Primary=0.00 cfs 0.000 af Outflow=1.54 cfs 0.118 af

Appendix III

Charts, Graphs, and Calculations

GROUNDWATER RECHARGE VOLUME (GRV)
(Env-Wq 1504.12)

	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
0.04	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
0.62	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.11	inches	Rd = Weighted groundwater recharge depth	
0.0719	ac-in	GRV = AI * Rd	
261	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	
	← Y/N	Is a stage-storage table attached showing that the GRV can be stored below the lowest invert of the outlet structure (if applicable)? Multiple stormwater control measures may be used to meet the GRV requirements.	

Provide calculations/discussion below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

Bioretention Pond #1: 2-Year Storm Contributing Volume = 0.047 af = 2,047 cf

Bioretention Pond #2: 2-Year Storm Contributing Volume = 0.051 af = 2,221 cf

Bioretention Pond #3: 2-Year Storm Contributing Volume = 0.035 af = 1,525 cf

Recharge Volume Provided = 5,793 cf (> 261 cf required)

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Bioretention Pond #1 / BP#1**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.28	ac	A = Area draining to the practice	
0.16	ac	A_I = Impervious area draining to the practice	
0.58	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.57	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.16	ac-in	WQV= 1" x Rv x A	
577	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
144	cf	25% x WQV (check calc for sediment forebay volume)	
433	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
121	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
472	sf	A_{SA} = Surface area of the practice	
1.88	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
7.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
93.05	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
91.02	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
90.58	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
93.05	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
2.47	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
2.03	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
92.05	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
95.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
11,400	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
12.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet 10A		Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet 10A		Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

* Note* Although stated above, pretreatment area (sediment forebay) is not allowed to be included in storage volume per KDT 2/4/2026.

Volume Above Filter Media (but below lowest outlet):

- Volume Elev 94.75 (Spillway Outlet) = 754 cf
- Less Volume Elev 94.05 (Btm Pond) = 330 cf
- Available Volume Above Filter Media = 424 cf

Volume In Filter Media Voids:

- Volume Elev 94.05 (Top of Filter Media) = 424 cf
- Less Volume Elev 93.05 (Btm of Filter Media) = 189 cf
- Available Volume In Filter Media Voids = 235 cf

Total Available Volume = 424 + 235 = 659 cf > 577 cf WQV

Stage-Area-Storage for Pond BP1: Bioretention Pond # 1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
92.05	472	0
92.10	472	9
92.15	472	19
92.20	472	28
92.25	472	38
92.30	472	47
92.35	472	57
92.40	472	66
92.45	472	76
92.50	472	85
92.55	472	94
92.60	472	104
92.65	472	113
92.70	472	123
92.75	472	132
92.80	472	142
92.85	472	151
92.90	472	160
92.95	472	170
93.00	472	179
93.05	472	189
93.10	472	196
93.15	472	203
93.20	472	210
93.25	472	217
93.30	472	224
93.35	472	231
93.40	472	238
93.45	472	245
93.50	472	253
93.55	472	260
93.60	472	267
93.65	472	274
93.70	472	281
93.75	472	288
93.80	472	295
93.85	472	302
93.90	472	309
93.95	472	316
94.00	472	323
94.05	472	330
94.10	491	354
94.15	510	379
94.20	529	405
94.25	548	432
94.30	567	460
94.35	586	489
94.40	605	519
94.45	624	550
94.50	643	581
94.55	662	614
94.60	681	647
94.65	700	682
94.70	719	717
94.75	738	754
94.80	757	791
94.85	776	830
94.90	795	869
94.95	814	909
95.00	**833**	**950**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Bioretention Pond #2 / BP#2**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.31	ac	A = Area draining to the practice	
0.17	ac	A_I = Impervious area draining to the practice	
0.56	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.56	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.17	ac-in	WQV= 1" x Rv x A	
625	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
156	cf	25% x WQV (check calc for sediment forebay volume)	
468	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
250	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
769	sf	A_{SA} = Surface area of the practice	
0.30	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
32.5	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
96.15	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
94.15	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
90.65	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
96.15	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
5.50	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
2.00	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
97.87	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
98.00	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
783	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
12.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	10A	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	10A	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

* Note* Although stated above, pretreatment area (sediment forebay) is not allowed to be included in storage volume per KDT 2/4/2026.

Volume Above Filter Media (but below lowest outlet):

Volume Elev 97.75 (Spillway Outlet)	= 1,101 cf
Less Volume Elev 97.15 (Btm Pond)	= 538 cf
Available Volume Above Filter Media	= 563 cf

Volume In Filter Media Voids:

Volume Elev 97.15 (Top of Filter Media)	= 538 cf
Less Volume Elev 96.15 (Btm of Filter Media)	= 308 cf
Available Volume In Filter Media Voids	= 230 cf

Total Available Volume = 563 + 230 = 783 cf > 625 cf WQV

Stage-Area-Storage for Pond BP2: Bioretention Pond # 2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
95.15	769	0
95.20	769	15
95.25	769	31
95.30	769	46
95.35	769	62
95.40	769	77
95.45	769	92
95.50	769	108
95.55	769	123
95.60	769	138
95.65	769	154
95.70	769	169
95.75	769	185
95.80	769	200
95.85	769	215
95.90	769	231
95.95	769	246
96.00	769	261
96.05	769	277
96.10	769	292
96.15	769	308
96.20	769	319
96.25	769	331
96.30	769	342
96.35	769	354
96.40	769	365
96.45	769	377
96.50	769	388
96.55	769	400
96.60	769	411
96.65	769	423
96.70	769	434
96.75	769	446
96.80	769	458
96.85	769	469
96.90	769	481
96.95	769	492
97.00	769	504
97.05	769	515
97.10	769	527
97.15	769	538
97.20	797	577
97.25	825	618
97.30	853	660
97.35	881	703
97.40	909	748
97.45	937	794
97.50	965	842
97.55	993	891
97.60	1,022	941
97.65	1,050	993
97.70	1,078	1,046
97.75	1,106	1,101
97.80	1,134	1,157
97.85	1,162	1,214
97.90	1,190	1,273
97.95	1,218	1,333
98.00	**1,246**	**1,395**

FILTRATION PRACTICE DESIGN CRITERIA
(Env-Wq 1508.08)

Type/Node Name: **Bioretention Pond #3 / BP#3**

Enter the type of filtration practice (e.g., bioretention system) and the node name in the drainage analysis, if applicable.

Yes		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.08(a).	
0.28	ac	A = Area draining to the practice	
0.12	ac	A_I = Impervious area draining to the practice	
0.43	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.44	unitless	Rv = Runoff coefficient = 0.05 + (0.9 x I)	
0.12	ac-in	WQV= 1" x Rv x A	
449	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
112	cf	25% x WQV (check calc for sediment forebay volume)	
337	cf	75% x WQV (check calc for surface sand filter volume)	
Sediment Forebay		Method of Pretreatment? (not required for clean or roof runoff)	
261	cf	V_{SED} = Sediment forebay volume, if used for pretreatment	**≥ 25%WQV**
Calculate time to drain if system IS NOT underdrained:			
991	sf	A_{SA} = Surface area of the practice	
3.00	iph	$Ksat_{DESIGN}$ = Design infiltration rate[1]	
		If Ksat (prior to factor of safety) is < 0.50 iph, has an underdrain been provided?	
	Yes/No	(Use the calculations below)	
1.8	hours	T_{DRAIN} = Drain time = V / (A_{SA} * I_{DESIGN})	**≤ 72-hrs**
Calculate time to drain if system IS underdrained:			
	ft	E_{WQV} = Elevation of WQV (attach stage-storage table)	
	cfs	Q_{WQV} = Discharge at the E_{WQV} (attach stage-discharge table)	
-	hours	T_{DRAIN} = Drain time = 2WQV/Q_{WQV}	**≤ 72-hrs**
97.75	feet	E_{FC} = Elevation of the bottom of the filter course material[2]	
	feet	E_{UD} = Invert elevation of the underdrain (UD), if applicable	
95.72	feet	E_{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
93.83	feet	E_{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
97.75	feet	$D_{FC\ to\ UD}$ = Depth to UD from the bottom of the filter course	**≥ 1'**
3.92	feet	$D_{FC\ to\ ROCK}$ = Depth to bedrock from the bottom of the filter course	**≥ 1'**
2.03	feet	$D_{FC\ to\ SHWT}$ = Depth to SHWT from the bottom of the filter course	**≥ 1'**
96.75	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
99.50	ft	Elevation of the top of the practice	
YES		50 peak elevation ≤ Elevation of the top of the practice	**← yes**
If a surface sand filter or underground sand filter is proposed:			
YES	ac	Drainage Area check.	**< 10 ac**
	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ 75%WQV**
	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet		Note what sheet in the plan set contains the filter course specification.	
	Yes/No	Access grate provided?	**← yes**

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	**← yes**
853	cf	V = Volume of storage[3] (attach a stage-storage table)	**≥ WQV**
12.0	inches	D_{FC} = Filter course thickness	**18", or 24" if within GPA**
Sheet	10A	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	**≥ 3:1**
Sheet	10A	Note what sheet in the plan set contains the planting plans and surface cover	
If porous pavement is proposed:			
		Type of pavement proposed (Concrete? Asphalt? Pavers? Etc.)	
	acres	A_{SA} = Surface area of the pervious pavement	
	:1	Ratio of the contributing area to the pervious surface area	**≤ 5:1**
	inches	D_{FC} = Filter course thickness	**12", or 18" if within GPA mod. 304.1 (see spec)**
Sheet		Note what sheet in the plan set contains the filter course spec.	

1. Rate of the limiting layer (either the filter course or the underlying soil). $Ksat_{design}$ includes factor of safey. See Env-Wq 1504.14 for guidance on determining the infiltration rate.

2. See lines 34, 40 and 48 for required depths of filter media.

3. Volume without depending on infiltration. The volume includes the storage above the filter (but below the invert of the outlet stucture, if any), the filter media voids, and the pretreatment area. The storage above the filter media shall not include the volume above the outlet structure, if any.

Designer's Notes:

* Note* Although stated above, pretreatment area (sediment forebay) is not allowed to be included in storage volume per KDT 2/4/2026.

Volume Above Filter Media (but below lowest outlet):

Volume Elev 99.25 (Spillway Outlet)	=	1,249 cf
Less Volume Elev 98.75 (Btm Pond)	=	694 cf
Available Volume Above Filter Media	=	555 cf

Volume In Filter Media Voids:

Volume Elev 98.75 (Top of Filter Media)	= 694 cf
Less Volume Elev 97.75 (Btm of Filter Media)	= 396 cf
Available Volume In Filter Media Voids	= 298 cf

Total Available Volume = 555 + 298 = 853 cf > 449 cf WQV

Stage-Area-Storage for Pond BP3: Bioretention Pond # 3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
96.75	991	0
96.80	991	20
96.85	991	40
96.90	991	59
96.95	991	79
97.00	991	99
97.05	991	119
97.10	991	139
97.15	991	159
97.20	991	178
97.25	991	198
97.30	991	218
97.35	991	238
97.40	991	258
97.45	991	277
97.50	991	297
97.55	991	317
97.60	991	337
97.65	991	357
97.70	991	377
97.75	991	396
97.80	991	411
97.85	991	426
97.90	991	441
97.95	991	456
98.00	991	471
98.05	991	486
98.10	991	500
98.15	991	515
98.20	991	530
98.25	991	545
98.30	991	560
98.35	991	575
98.40	991	590
98.45	991	605
98.50	991	619
98.55	991	634
98.60	991	649
98.65	991	664
98.70	991	679
98.75	991	694
98.80	1,015	744
98.85	1,039	795
98.90	1,063	848
98.95	1,086	901
99.00	1,110	956
99.05	1,134	1,012
99.10	1,158	1,070
99.15	1,182	1,128
99.20	1,206	1,188
99.25	1,230	1,249
99.30	1,254	1,311
99.35	1,277	1,374
99.40	1,301	1,439
99.45	1,325	1,504
99.50	**1,349**	**1,571**

Mission Wetland & Ecological Services, LLC
P.O. Box 4028
Portsmouth, NH 03802
(603) 361-3204

MEMORANDUM

To	Eric Salovitch, LLS – Northam Survey	Page 1
CC		
Subject	Wetland Delineation – 210 Portsmouth Avenue (Tax Map 21, Lot 81) Stratham, NH	
From	Sergio Bonilla, PWS, CWS	
Date	January 15, 2025	

Mission Wetland & Ecological Services, LLC (Mission) delineated the project-relevant boundaries of the freshwater wetlands associated with the above-referenced project locus on January 14, 2025. The wetland delineation was conducted by Sergio Bonilla, New Hampshire Certified Wetland Scientist (CWS) #261 (the State of Maine reciprocates the New Hampshire wetland scientist certification), in accordance with the *United States Army Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (January 1987), and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2 – TR-12-1, January 2012.* The boundaries of the freshwater wetlands are demarcated in the field using solid pink, blue, and pin flagging, alpha-numerically labeled **SB-1 (start open)** through **SB-9 (stop open)**, **A-1 (start open)** through **A-9 (stop open)**, **B-1 (start open)** through **B-16 (stop open)**, **C-1 (start open)** through **C-14 (stop open)**, and **D-1 (start)** through **D-5 (connect)**. Per Chapter 5 of the above-referenced document, Difficult Wetland Situations in the Northcentral and Northeast Region, in this case the limit of disturbed, poorly-drained hydric soils within a maintained lawn scenario underlain with hydric soil is included within the boundary (approximately C-4 through C-7, and D-1 through D-5). In addition, there are wetlands present on the easterly portion of the parcel that were not delineate as part of this scope.

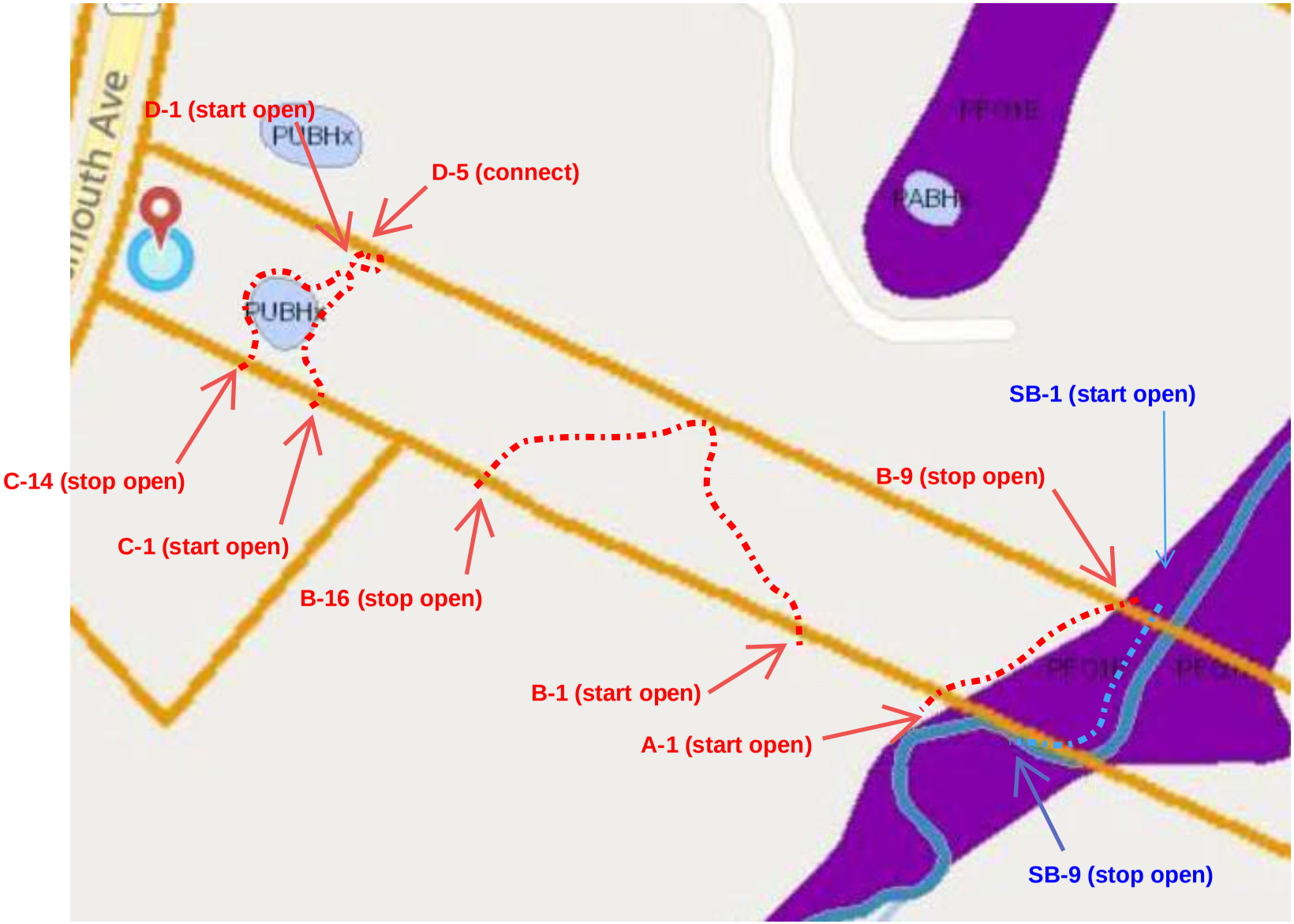
The wetlands were classified in accordance with the *US Fish & Wildlife Service Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, 1979) as palustrine emergent and forested wetland systems with deciduous vegetation that are seasonally flooded/saturated/intermittently exposed (PFO1E, PFO1G), and a permanently-flooded palustrine unconsolidated bottom and excavated pond system (PUBHx). Mission utilized *The National Wetland Plant List, ERDC/CRREL TR-12-11, Hanover, NH: U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory* (Lichvar, R.W. 2012, 2016) and referenced the *Field Indicators for Identifying Hydric Soils in New England, Version 4* (2019) *and/or Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 8.2* (2018) to determine the presence of hydric soils.

The wetlands are located in drainage saddle configurations associated with the site at topographically lower elevations and supported by a high seasonal groundwater table and fine sandy loam soils with a depleted matrix that exhibit redoximorphic features. In addition, the “A-series” wetland extension is supported hydrologically by Jewitt Hill Brook, a perennial stream at the rear portion of the parcel. The vegetation in the wetlands includes, but is not limited to, red maple (*Acer rubrum*), white ash (*Fraxinus americana*), winterberry (*Ilex verticillata*), spicebush (*Lindera benzoin*), speckled alder (*Alnus rugosa*),

silky dogwood (*Cornus amomum)*, glossy buckthorn (*Frangula alnus*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), poison ivy (*Toxicodendron radicans*), royal fern (*Osmunda regalis*), purple loosestrife (*Lythrum salicaria*), soft rush, (*Juncus effusus*), fringed sedge (*Carex crinita*), and sphagnum moss (*Shagnum* spp.).

Attached, please find a wetland delineation sketch to facilitate any future instrument survey. Please call me with any questions or if you require additional information.

23-050 -- Northam Survey 210 Portsmouth - Avenue Stratham, NH



SB-1 (start open) through SB-9 (stop open) - MAHW of Jewitt Hill Brook (perennial stream)
A-1 (start open) through A-9 (stop open) - PFO1G
B-1 (start open) through B-16 (stop open) - PFO1E
C-1 (start open) through C-14 (stop open) - PUBHx/PEMIE
D-1 (start open) through D-5 (connect) - PEMIE

* sketch only
** not to scale
*** to facilitate survey location

***any potential wetlands associated with the easterly side of Jewitt Hill Brook and beyond have not been delineated as part of this scope.**

SITE-SPECIFIC SOIL SURVEY REPORT
210 Portsmouth Ave
Stratham

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 7.0, July 2021. This map product is within the technical standards of the National Cooperative Soil Survey. It is a special product, intended for the submission to NH DES Alteration of Terrain. It was produced by a professional soil scientist and is not a product of the USDA Natural Resource Conservation Service.

Hydrologic Soil Group was determined using SSSNNE Special Publication No. 5.
Scale of soil map:
Approximately 1" equals 60'
Contours:
Intervals of 2 foot

2. DATE SOIL MAP PRODUCED

Date(s) of on-site fieldwork:11/24/25
Date(s) of test pits: 3/26/2024, Test pits 4-9 & D1-D3 9/10/2025
Test pits recorded by: Joseph Nichols Designer # 1451

3. GEOGRAPHIC LOCATION AND SIZE OF SITE

City or town where soil mapping was conducted: Stratham
Location: 210 Portsmouth Ave, Map 21, Lot 81
Size of area: Approximately 6 acres
Was the map for the entire lot? No
The area where the soil mapping was performed is an existing residential lot, with house, driveway and barn, as well as open fields, wooded hillsides and wetlands. The mapping area was only for the proposed development area.

4. PURPOSE OF THE SOIL MAP

Was the map prepared to meet the requirement of Alteration of Terrain? Yes
If no, what was the purpose of the map?
Who was the map prepared for? Beals Associates, PLLC

5. SOIL IDENTIFICATION LEGEND

SSSM SYM.	SSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
313	Deerfield	311	B
448	Scituate	323	C
546	Walpole	521	C
115	Scarboro	621	D

SLOPE PHASE:

0-8% B 8-15% C 15-25% D 25%+ E

6.0 UNIT DESCRIPTIONS		HISS	Hydrologic Soil Group
313	Deerfield	311	B

The Deerfield series consists of very deep, moderately well drained soils formed in glaciofluvial deposits. They are nearly level to strongly sloping soils on terraces, deltas, and outwash plains. Slope ranges from 0 to 15 percent. These soils are found on the site in some of the side slope areas adjacent to the wetlands as well as in the rear, eastern portion of the mapping area. They have an ESHWT between 15-40 inches and no ledge was encountered.
Typical Profile
0" - 5" 10YR 3/3 Dark Brown, Fine Sandy Loam, , Friable
5" - 36" 10YR 5/4 Yellowish Brown, Gravelly, Fine Sandy Loam Granular, Friable
36" - 55" 2.5Y 5/3 Light Olive Brown, Gravelly, Fine Loamy Sand Massive, Firm W/ Redox
ESHWT = 36 Inches
Observed Ground Water - None
Restrictive @ 36 Inches
Refusal - None

448	Scituate	313	C

The Scituate series consists of moderately well drained soils formed in a loamy eolian influenced mantle of till underlain by sandy lodgement till. The soils are very deep to bedrock and moderately deep to a densic contact. They are nearly level through moderately steep soils on glaciated uplands. Saturated hydraulic conductivity is moderately high or high in the solum and moderately low or moderately high in the substratum. These soils are the dominant series within the mapping area. They are typically firm with a mineral restrictive layer in the C horizon. They have an ESHWT between 15-40 inches and no ledge.
Typical Profile
0" - 7" 10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
7" - 30" 10YR 5/4 Yellowish Brown, Fine Sandy Loam Granular, Friable
30" - 40" 10YR 5/3 Brown Gravelly, Fine Sandy Loam, Granular, Friable
40" - 47" 10YR 4/2 Dark Grayish Brown, Gravelly, Loamy Sand Massive, Friable W/ Redox
47" - 63" 2.5Y 5/3 Light Olive Brown, Fine Sandy Loam Blocky, Firm W/ Redox
ESHWT = 40 Inches
Observed Ground Water - None
Restrictive @ 40 Inches
Refusal - None
Perc Rate = 10 min/inch @ 20"

546	Walpole	521	C

The Walpole Series consists of very deep, poorly drained sandy soils formed in outwash and stratified drift. They are nearly level to gently sloping soils in low-lying positions on terraces and plains. Slope ranges from 0 to 8 percent. Saturated hydraulic conductivity is moderately high or high in the surface layer and subsoil, and high or very high in the substratum.

115 Scarboro 621 D

The Scarboro series consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are nearly level soils in depressions. Slope ranges from 0 through 3 percent. Saturated hydraulic conductivity is high or very high.

OTHER DISTINGUISHING FEATURES OF SITE
Is the site in a natural condition? Yes.

8.0 Inclusions
No Inclusions were mappe



NOTES:

1. SUBJECT PARCEL: TAX MAP 21 LOT 81
   210 PORTSMOUTH AVE
   STRATHAM, NH
   NS PROJECT #1019
2. OWNER OF RECORD: RED BARN PROPERTY LLC
   6 SHORE DRIVE
   GREENLAND, NH 03840
   R.C.R.D. BOOK 6543, PAGE 1271
3. PARCEL AREA: 484,172 S.F. OR 11.12 AC
4. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS OF THE SUBJECT PARCEL.
5. DIMENSIONAL REQUIREMENTS:

	ZONE: ROUTE 33 LEGACY HIGHWAY HERITAGE
MIN LOT AREA:	2 ACRES
MIN LOT FRONTAGE:	200'
MAX LOT FRONTAGE:	40'
MIN FRONT SETBACK:	WITHIN 10' OF AVERAGE OF EXISTING SETBACKS/ MAX 35'
MIN SIDE/REAR SETBACK	20'
MAX BUILDING HEIGHT:	35'
MAX BUILDING FOOTPRINT:	10,000 S.F.
MAX BUILDING COVERAGE:	20%
MIN OPEN SPACE/LOT:	60%
WETLAND SETBACKS: POORLY DRAINED SOILS	
NO-DISTURBANCE BUFFER	25'
BUILDING ACTIVITY BUFFER	50'
SPECIAL CARE BUFFER	100'

OVERLAY DISTRICTS: WETLANDS CONSERVATION DISTRICT

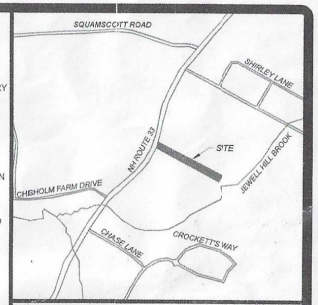
NOTES CONTINUED:

ZONING INFORMATION SHOWN HEREON IS PER THE TOWN OF STRATHAM ZONING ORDINANCE DATED MARCH 1987 LAST REVISED MARCH 2024. ADDITIONAL REGULATIONS APPLY, THE LAND OWNER IS RESPONSIBLE FOR COMPLYING WITH ALLAPPLICABLE TOWN, STATE, AND FEDERAL REGULATIONS.

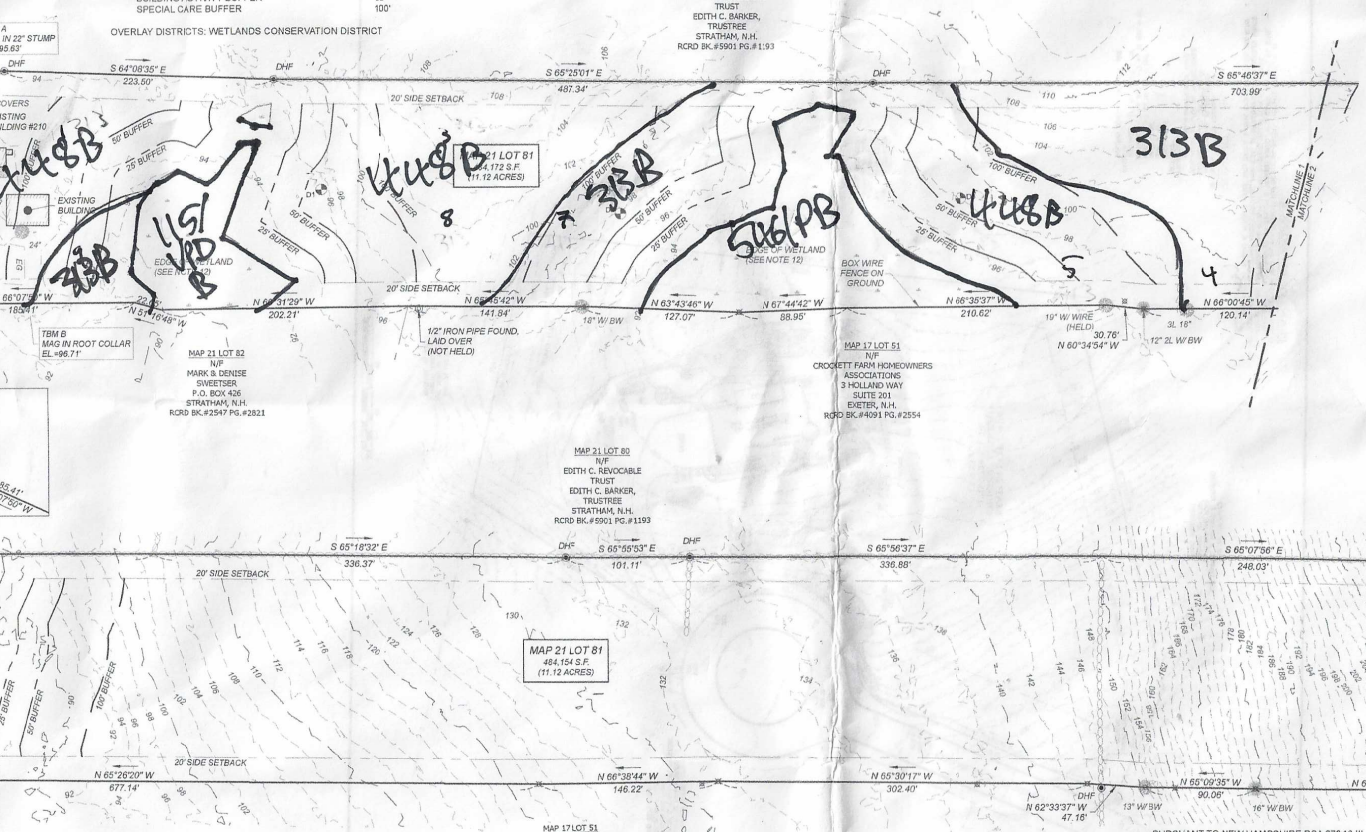
6. FLOOD HAZARD ZONE "X" WITH NO BASE FLOOD ELEVATION , PER FIRM MAP #33015C0245F, WITH AN EFFECTIVE DATE OF JANUARY 29, 2021.
7. THE INTENT OF THIS PLAN IS TO SHOW THE LOCATION OF BOUNDARIES IN ACCORDANCE WITH THE CURRENT LEGAL DESCRIPTIONS. IT IS NOT AN ATTEMPT TO DEFINE UNWRITTEN RIGHTS, DETERMINE THE EXTENT OF OWNERSHIP, OR DEFINE THE LIMITS OF TITLE.
8. FIELD SURVEY COMPLETED BY NORTHAM SURVEY IN JANUARY AND FEBRUARY 2025 USING A TRIMBLE S5 TOTAL STATION WITH A TRIMBLE TSC3 DATA COLLECTOR, A TRIMBLE R12 GPS RECEIVER AND A SOKKIA B31 AUTO LEVEL.
9. HORIZONTAL DATUM IS NAD83(2011) NEW HAMPSHIRE STATE PLANE COORDINATES PER STATIC GPS OBSERVATIONS.
10. THE VERTICAL DATUM IS NAVD88 PER STATIC GPS OBSERVATIONS. THE CONTOUR INTERVAL IS 2'. CONTOUR INFORMATION SHOWN HEREON IS PER PUBLIC LIDAR DATA 2019-2020 USGS LIDAR: NH COASTAL (QL1) PROCESSED AND DOWNLOADED FROM THE NOAA OFFICE FOR COASTAL MANAGEMENT.

NOTES CONTINUED:

11. EASEMENTS, RIGHTS, AND RESTRICTIONS SHOWN OR IDENTIFIED ARE THOSE WHICH WERE FOUND DURING RESEARCH PERFORMED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS. OTHER RIGHTS, EASEMENTS, OR RESTRICTIONS MAY EXIST WHICH A TITLE EXAMINATION OF SUBJECT PARCEL(S) WOULD DETERMINE.
12. WETLAND DELINEATION CONDUCTED BY SERGIO BONILLA, NEW HAMP SHIRE STATE CERTIFIED WETLAND SCIENTIST (#261) ON 1/14/2025 IN ACCORDANCE WITH THE UNITED STATES ARMY CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1 (JANUARY 1987), AND THE REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION (VERSION 2-TR-12-1, JANUARY 2012).
13. THIS SURVEY WAS CONDUCTED IN WINTER CONDITIONS. SOME SITE FEATURES MAY HAVE BEEN OBSCURED DUE TO SNOW. A SPRING TIME SITE WALK IS RECOMMENDED TO VERIFY EXISTING CONDITIONS.



LOCUS



313 Deerfield HSG
448 Situate HSG
546 Walpole HSG
115 Scarboro HSG

LEGEND:

- MAP 107 LOT 11 — ASSESSORS MAP AND LOT NUMBER
- BK.#/ PG. — BOOK/ PAGE
- CONC — CONCRETE
- DHF — DRILL HOLE FOUND
- EM — ELECTRIC METER
- EP — EDGE OF PAVEMENT
- EG — EDGE OF GRAVEL
- N/F — NOW OR FORMERLY
- RCRD — ROCKINGHAM COUNTY REGISTRY OF DEEDS
- S.F. — SQUARE FEET
- TBM — TEMPORARY BENCHMARK
- BARBED WIRE
- DHS — DRILL HOLE FOUND/SET
- IPF/IPS — IRON PIPE/ROD FOUND
- BOUND FOUND
- SPIKE/NAIL FOUND
- BARBED WIRE ON GROUND
- AIR CONDITIONER
- GUY WIRE
- UTILITY POLE
- E — ELECTRIC BOX
- MAILBOX
- VENT PIPE
- POST
- STUMP
- CONIFEROUS TREE
- DECIDUOUS TREE
- TEMPORARY BENCHMARK
- SIGN
- OHW — OVERHEAD WIRE
- BOX WIRE FENCE
- BOUNDARY LINE
- SETBACK LINE
- EXISTING CONTOUR
- STONEWALL
- EDGE OF WETLAND
- WETLAND SETBACK
- SPECIAL CARE BUFFER
- CONCRETE
- WETLANDS
- BRICK
- WOODEN DECK
- TEST PITS

EXISTING CONDITIONS
FOR
RED BARN PROPERTY LLC
OF
TAX MAP 21 LOT 81
210 PORTSMOUTH AVE
STRATHAM, NH
COUNTY OF ROCKINGHAM

NICHOLS ENVIRONMENTAL, LLC.

102 CHESTER ROAD
FREMONT, NH 03044
nicholsenviro@gmail.com
Office: 603-244-5325
Cell: 603-234-3228

Job Number 24-027
Test pits 1-3 Logged on 3/26/2024, Test pits 4-9 & D1-D3 9/10/2025 By Joseph Nichols Designer # 1451
Witnessed by Mike Cuomo Rockingham County Conservation District
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # 1

0" - 7"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
7" - 30"	10YR 5/4 Yellowish Brown, Fine Sandy Loam Granular, Friable
30" - 40"	10YR 5/3 Brown Gravelly, Fine Sandy Loam, Granular, Friable
40" - 47"	10YR 4/2 Dark Grayish Brown, Gravelly, Loamy Sand Massive, Friable W/ Redox
47" - 63"	2.5Y 5/3 Light Olive Brown, Fine Sandy Loam Blocky, Firm W/ Redox

ESHWT = 40 Inches
Observed Ground Water - None
Restrictive @ 40 Inches
Refusal - None
Perc Rate = 10 min/inch @ 20"

NEW HAMPSHIRE
Designer
of
Subsurface Disposal
Systems
Joseph Paul Nichols
Joseph P. Nichols
No. 1451
Department of Environmental Services

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210 Portsmouth Ave.
Stratham, NH

Test Pit # 2

0" - 5"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
5" - 36"	10YR 5/4 Yellowish Brown, Gravelly, Fine Sandy Loam Granular, Friable
36" - 55"	2.5Y 5/3 Light Olive Brown, Gravelly, Fine Loamy Sand Massive, Firm W/ Redox

ESHWT = 36 Inches
Observed Ground Water - None
Restrictive @ 36 Inches
Refusal - None
Perc Rate = 6 min/inch @ 20"

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Stratham, NH

Test Pit # 3

0" - 5"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
5" - 25"	10YR 5/4 Yellowish Brown, Fine Sandy Loam Granular, Friable
25" - 56"	2.5Y 5/3 Light Olive Brown, Fine Loamy Sand Massive, Firm W/ Redox

ESHWT = 25 Inches
Observed Ground Water - None
Restrictive @ 25 Inches
Refusal - None
Perc Rate = 8 min/inch @ 20"

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210 Portsmouth Ave.
Stratham, NH

Test Pit # 4

0" - 8"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 16"	10YR 5/4 Yellowish Brown, Fine Sandy Loam Granular, Friable
16" - 38"	2.5Y 6/4 Light Yellowish Brown, Fine Loamy Sand Massive, Friable
38" - 65"	2.5Y 6/2 Light Brownish Gray, Fine Loamy Sandy Blocky, Friable W/ Redox

ESHWT = 38 Inches
Observed Ground Water - None
Restrictive - None
Refusal - None
Perc Rate = 6 min/inch @ 30"

NEW HAMPSHIRE
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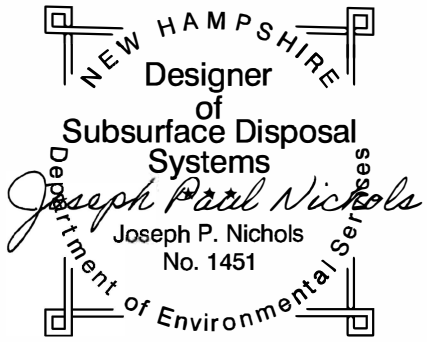
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Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # 5

0" - 8"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 30"	10YR 5/4 Yellowish Brown, Fine Sand Massive, Friable
30" - 38"	2.5Y 5/3 Light Olive Brown, Fine to Medium Sand Massive, Friable W/ Redox
38" - 62"	2.5Y 5/2 Grayish Brown, Very Fine Silt Loam Blocky, Firm W/ Redox

ESHWT = 30 Inches
Observed Ground Water - None
Restrictive @ 38 Inches
Refusal - None
Perc Rate = 6 min/inch @ 24"



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Witnessed by Mike Cuomo Rockingham County Conservation District
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # 6

0" - 8"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 13"	10YR 5/4 Yellowish Brown, Fine Sandy Loam Granular, Friable
13" - 24"	2.5Y 6/4 Light Yellowish Brown, Gravelly, Sandy Loam Massive, Friable
24" - 53"	2.5Y 6/3 Light Yellowish Brown, Gravelly Loamy Sand Massive, Firm W/ Redox

ESHWT = 24 Inches
Observed Ground Water - None
Restrictive @ 24 Inches
Refusal - None
Perc Rate = 6 min/inch @ 20"

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Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # 7

0" - 4"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
4" - 8"	10YR 5/4 Yellowish Brown, Fine Sand Massive, Friable
8" - 27"	2.5Y 6/4 Light Yellowish Brown, Fine Sand Massive, Friable
27" - 61"	2.5Y 6/3 Light Yellowish Brown, Fine Sand Blocky, Friable W/ Redox

ESHWT = 27 Inches
Observed Ground Water - None
Restrictive - None
Refusal - None
Perc Rate = 6 min/inch @ 24"

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Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # 8

0" - 8"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 20"	2.5Y 6/4 Light Yellowish Brown, Fine Sand Massive, Friable
20" - 30"	10YR 5/4 Light Yellowish Brown, Gravelly, Loamy Sand Massive, Friable
30" - 60"	2.5Y 6/3 Light Yellowish Brown, Gravelly, Fine Sand Massive, Firm W/ Redox

ESHWT = 30 Inches
Observed Ground Water - None
Restrictive @ 30 Inches
Refusal - None
Perc Rate = 6 min/inch @ 28"

NEW HAMPSHIRE Designer of Subsurface Disposal Systems
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Job Number 24-027
Test pits 1-3 Logged on 3/26/2024, Test pits 4-9 & D1-D3 9/10/2025 By Joseph Nichols Designer # 1451
Witnessed by Mike Cuomo Rockingham County Conservation District
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # 9

0" - 8"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 22"	10YR 5/6 Yellowish Brown, Fine Sandy Loam Granular, Friable
22" - 33"	10YR 5/4 Light Yellowish Brown, Gravelly, Loamy Sand Massive, Friable
33" - 53"	2.5Y 5/3 Light Yellowish Brown, Gravelly, Loamy Sand Massive, Friable W/ Redox

ESHWT = 33 Inches
Observed Ground Water - None
Restrictive - None
Refusal - None
Perc Rate = 6 min/inch @ 28"

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Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # D1

0" - 10"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
10" - 18"	2.5Y 5/6 Light Olive Brown, Fine Sand Massive, Friable
18" - 60"	2.5Y 6/2 Light Brownish Gray, Fine Sandy Loam Blocky, Firm W/ Redox

ESHWT = 18 Inches
Observed Ground Water - None
Restrictive @ 18 Inches
Refusal - None
Perc Rate = 6 min/inch @ 18"

NEW HAMPSHIRE
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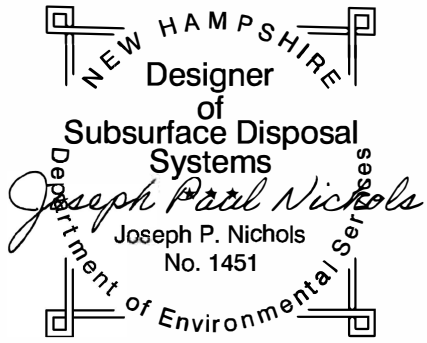
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Witnessed by Mike Cuomo Rockingham County Conservation District
Tax Map 21, Lot 81
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Stratham, NH

Test Pit # D2

0" - 12"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
12" - 18"	10YR 6/4 Light Yellowish Brown, Fine Sand Massive, Friable
18" - 30"	2.5Y 7/4 Pale Yellow, Fine Sand Massive, Friable
30" - 60"	2.5Y 6/3 Light Yellowish Brown, Fine Sand Blocky, Friable W/ Redox

ESHWT = 30 Inches
Observed Ground Water - None
Restrictive - None
Refusal - None
Perc Rate = 6 min/inch @ 20"



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Job Number 24-027
Test pits 1-3 Logged on 3/26/2024, Test pits 4-9 & D1-D3 9/10/2025 By Joseph Nichols Designer # 1451
Witnessed by Mike Cuomo Rockingham County Conservation District
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # D3

0" - 8"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 17"	10YR 5/4 Yellowish Brown, Fine Sandy Loam Granular, Friable
17" - 28"	2.5Y 6/4 Light Yellowish Brown, Gravelly, Fine Sandy Loam Granular, Friable
28" - 72"	2.5Y 6/3 Light Yellowish Brown, Gravelly, Fine Loamy Sand Massive, Firm W/ Redox

ESHWT = 28 Inches
Observed Ground Water - None
Restrictive @ 28 Inches
Refusal - None
Perc Rate = 8 min/inch @ 24"

NEW HAMPSHIRE
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Job Number 24-027
Test pit A logged on 8/26/2026 by Joseph Nichols Designer # 1451
Witnessed by Mike Cuomo Rockingham County Conservation District
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # A

0" - 6"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
6" - 53"	10YR 5/4 Yellowish Brown, Gravelly, Fine Sandy Loam Granular, Friable
53" - 60"	2.5Y 5/3 Light Olive Brown, Gravelly, Fine Loamy Sand Massive, Friable W/ Redox

ESHWT = 53 Inches
Observed Ground Water - None
Restrictive - None
Refusal - None
Perc Rate = 6 min/inch @ 20"

NEW HAMPSHIRE
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Systems
Joseph Paul Nichols
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Job Number 24-027
Test pit D4 logged on 8/26/2026 by Joseph Nichols Designer # 1451
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # D4

0" - 9"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
8" - 18"	10YR 5/6 Yellowish Brown, Fine Loamy Sand Massive, Friable
18" - 23"	2.5Y 5/3 Light Olive Brown, Fine Loamy Sand Massive, Friable W/ Redox
23" - 60"	2.5Y 5/3 Light Olive Brown, Gravelly, Fine Loamy Sand Massive, Firm W/ Redox

ESHWT = 18 Inches
Observed Ground Water - None
Restrictive @ 23 Inches
Refusal - None
Perc Rate = 6 min/inch @ 18"

NEW HAMPSHIRE Designer of Subsurface Disposal Systems
Joseph Paul Nichols
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Job Number 24-027
Test pit D4 logged on 8/26/2026 by Joseph Nichols Designer # 1451
Tax Map 21, Lot 81
210 Portsmouth Ave.
Stratham, NH

Test Pit # D5

0" - 10"	10YR 3/3 Dark Brown, Fine Sandy Loam, Granular, Friable
10" - 23"	2.5Y 5/6 Light Olive Brown, Fine Loamy Sand Massive, Friable
23" - 36"	2.5Y 6/3 Light Yellowish Brown, Fine Loamy Sand Massive, Friable W/ Redox
36" - 60"	2.5Y 5/3 Light Olive Brown, Gravelly, Fine Loamy Sand Massive, Firm W/ Redox

ESHWT = 23 Inches
Observed Ground Water - None
Restrictive @ 36 Inches
Refusal - None
Perc Rate = 6 min/inch @ 18"

NEW HAMPSHIRE Designer of Subsurface Disposal Systems
Joseph Paul Nichols
Joseph P. Nichols
No. 1451
Department of Environmental Services

Appendix IV

Plans

** THIS DRAWING IS FOR DRAINAGE PURPOSES ONLY **

WATERSHED LEGEND

- 4 — SUBCATCHMENT
- 4 — REACH
- 4 — POND
- LIMIT OF SUBCATCHMENT
- FLOW PATH

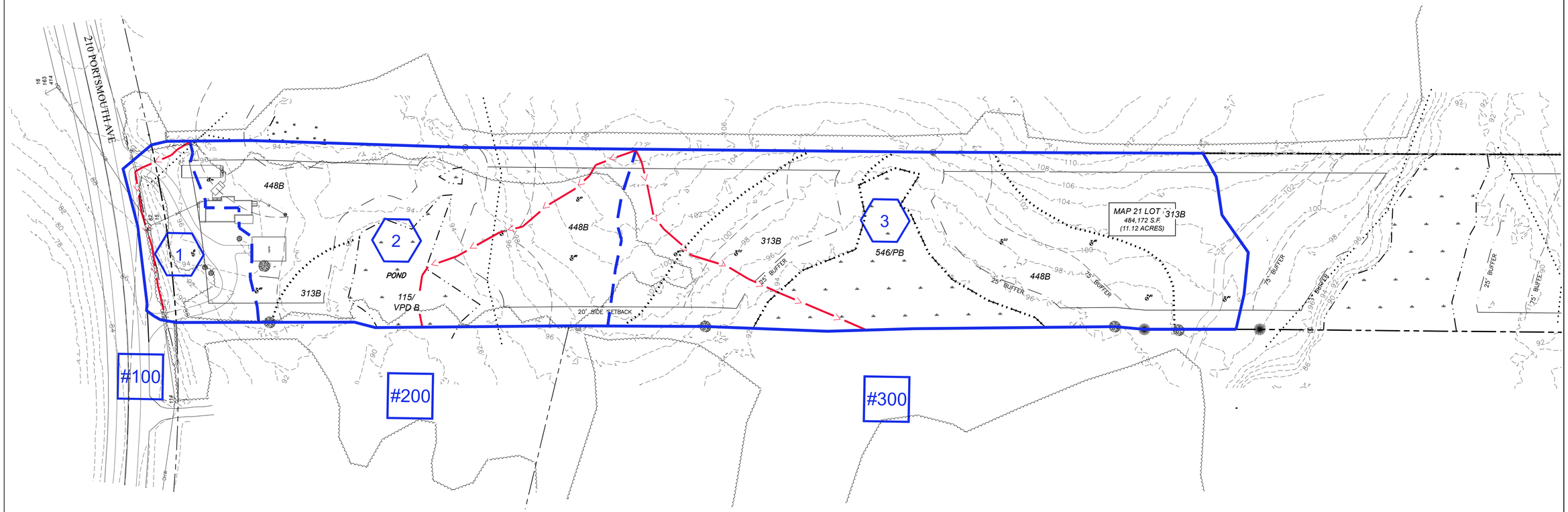
ZONING REQUIREMENTS

ZONE	ROUTE 33 LEGACY HIGHWAY HERITAGE
FRONT YARD	35 FT.
SIDE & REAR YARD	20 FT.
BUILDING HEIGHT	35 FT.
WETLAND SETBACKS	25 FT. NO DISTURBANCE 50 FT. BUILDING 75 FT. SEPTIC

PREPARED FOR:

RED BARN PROPERTY LLC
6 SHORE DRIVE
GREENLAND, NH 03840

BA BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,



THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

THE SITE SPECIFIC SOIL SURVEY (SSSS) WAS PRODUCED 11/24/25, AND WAS PREPARED BY LUKE HURLEY, CSS # 095, HURLEY ENVIRONMENTAL AND LAND PLANNING, LLC.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE #10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOILS COMPONENTS OF THE COMPLEX.

HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009.

SSSM SYMBOL	SSS MAP NAME	HISS SYMBOL	HYDROLOGIC SOIL GROUP
313	DEERFIELD	311	B
448	SCITUATE	323	C
546	WALPOLE	521	C
115	SCARBORO	621	D

SLOPE PHASE:
0-8% B 8-15% C 15-25% D 25%+ E

50 0 25 50 100 200

REVISIONS:	DATE:

PRE-DEVELOPMENT PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
210 PORTSMOUTH AVE
STRATHAM, NH

DATE:	MAR 11, 2026	SCALE:	1"=50'
PROJ. N0:	NH-1566	SHEET NO.	WS-1

** THIS DRAWING IS FOR DRAINAGE PURPOSES ONLY **

WATERSHED LEGEND

- 4 — SUBCATCHMENT
- 4 — REACH
- 4 — POND
- LIMIT OF SUBCATCHMENT
- FLOW PATH

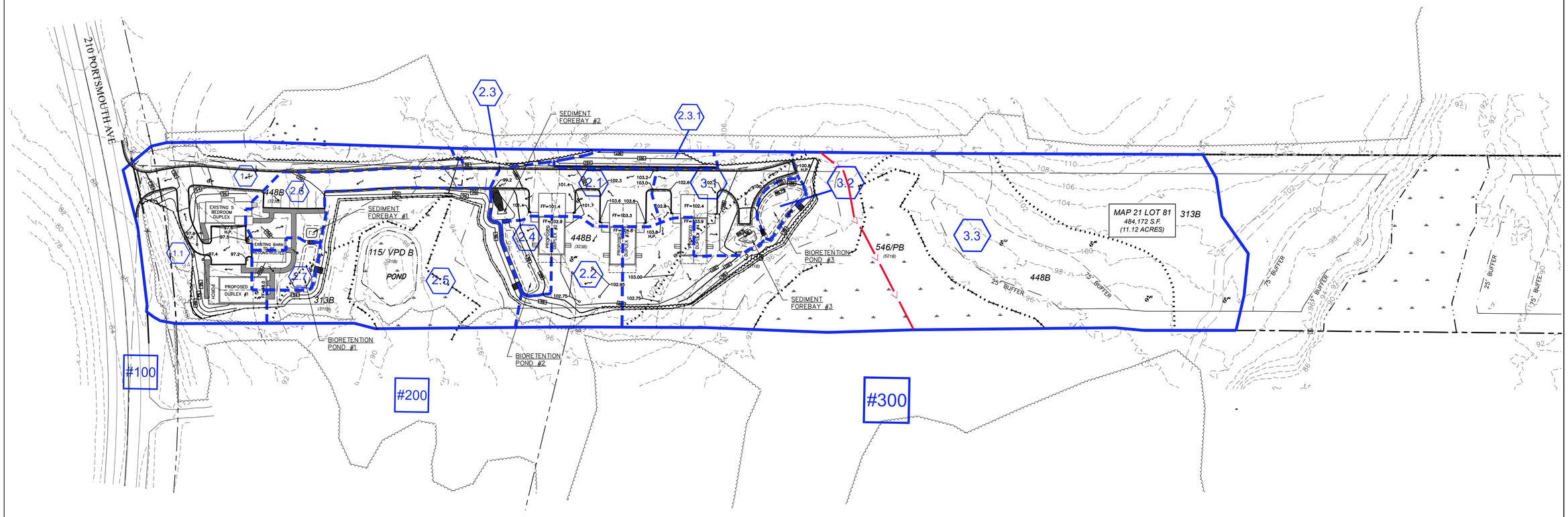
ZONING REQUIREMENTS

ZONE	ROUTE 33 LEGACY HIGHWAY HERITAGE
FRONT YARD	35 FT.
SIDE & REAR YARD	20 FT.
BUILDING HEIGHT	35 FT.
WETLAND SETBACKS	25 FT. NO DISTURBANCE
	50 FT. BUILDING
	75 FT. SEPTIC

PREPARED FOR:

RED BARN PROPERTY LLC
6 SHORE DRIVE
GREENLAND, NH 03840

BEALS ASSOCIATES, PLLC
70 PORTSMOUTH AVE,
THIRD FLOOR, SUITE 2
STRATHAM, N.H. 03885
PHONE: 603-583-4860,



THIS MAP PRODUCT IS WITHIN THE TECHNICAL STANDARDS OF THE NATIONAL COOPERATIVE SOIL SURVEY. IT IS A SPECIAL PURPOSE PRODUCT, INTENDED FOR INFILTRATION REQUIREMENTS BY THE NH DES ALTERATION OF TERRAIN BUREAU. IT WAS PRODUCED BY A PROFESSIONAL SOIL SCIENTIST, AND IS NOT A PRODUCT OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE. THERE IS A REPORT THAT ACCOMPANIES THIS MAP.

THE SITE SPECIFIC SOIL SURVEY (SSSS) WAS PRODUCED 11/24/25, AND WAS PREPARED BY LUKE HURLEY, CSS # 095, HURLEY ENVIRONMENTAL AND LAND PLANNING, LLC.

SOILS WERE IDENTIFIED WITH THE NEW HAMPSHIRE STATE-WIDE NUMERICAL SOILS LEGEND, USDA NRCS, DURHAM, NH. ISSUE #10, JANUARY 2011. THE NUMERIC LEGEND WAS AMENDED TO IDENTIFY THE CORRECT SOILS COMPONENTS OF THE COMPLEX.

HYDROLOGIC SOIL GROUP FROM KSAT VALUES FOR NEW HAMPSHIRE SOILS, SOCIETY OF SOIL SCIENTISTS OF NEW ENGLAND, SPECIAL PUBLICATION NO. 5, SEPTEMBER, 2009.

SSSM SYMBOL	SSS MAP NAME	HISS SYMBOL	HYDROLOGIC SOIL GROUP
313	DEERFIELD	311	B
448	SCITUATE	323	C
546	WALPOLE	521	C
115	SCARBORO	621	D

SLOPE PHASE:
0-8% B 8-15% C 15-25% D 25%+ E

50 0 25 50 100 200

REVISED PER REVIEW COMMENTS	11/03/26
REVISED PER REVIEW COMMENTS	09/01/26
REVISED PER REVIEW COMMENTS	07/13/26
REVISIONS:	DATE:

CHRISTIAN O. SMITH No.9900 — STATE OF NEW HAMPSHIRE — PROFESSIONAL ENGINEER

POST DEVELOPMENT PLAN

PLAN FOR:
RESIDENTIAL DEVELOPMENT
210 PORTSMOUTH AVE
STRATHAM, NH

DATE:	MAR 11, 2026	SCALE:	1"=50'
PROJ. N0:	NH-1566	SHEET NO.	WS-2