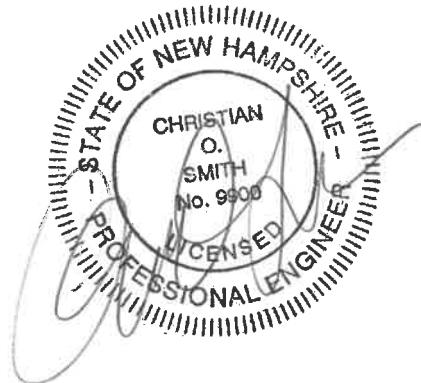


**DRAINAGE ANALYSIS
&
SEDIMENT AND EROSION
CONTROL PLAN**
Prepared for:
**J & L TERRA HOLDINGS, INC
US ROUTE 9 – BARRINGTON, NH**

Prepared by:

**BEALS ASSOCIATES, *PLLC*
SEVENTY PORTSMOUTH AVENUE
STRATHAM, NH 03885**

Project Number:
NH-1263
Route 9
Barrington, New Hampshire
August 10, 2020
Revised 1-6-21



DESIGN METHOD OBJECTIVES

J & L Terra Holdings, Inc. proposes an 80-unit residential condominium development on approximately 21+-acres of land located off Route 9 in Barrington, NH. A drainage analysis of the area (including 2-offsite subcatchments) was conducted for the purpose of estimating the peak rate of stormwater run-off and to subsequently design adequate drainage structures. It should be noted that all roof runoff from the newly proposed buildings will be required to be infiltrated by stone trench drip edges. 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 data for the 2, 10 & 50 Yr – 24 Hr storm event using the USDA SCS TR-20 method within the HydroCAD Stormwater Modeling System environment. Rainfall data is based on the Extreme Precipitation Tables as published by the Northeast Regional Climate Center of Cornell University. The purpose of this analysis is to estimate the peak rates of run-off from the site for swale adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

METHODOLOGY

Modeling consists of identifying all surface water flow paths that drain to, across and from the property as applicable. The “watershed area”, is divided into discrete subcatchments based on natural drainage patterns. HydroCAD models each drainage structure and subcatchment as an individual interconnected node. Subcatchment nodes are modeled as individual watersheds with unique physical characteristics consisting of surface area, surface condition, overland flow lengths and associated land slope. Appropriate input parameters were determined through field observation, and analysis of field surveyed AutoCAD drawings. Rainfall distribution and depth are standardized inputs, based on geographic location. The Time-of-Concentration, or Tc, is the time required for runoff to travel from the most hydrologically distant point of the subcatchment to the point of collection. The time of concentration (Tc) is determined by summing the travel time (Tt) for each consecutive flow segment along the subcatchment's hydraulic path. This process requires identification of the type of flow occurring in each segment, and application of the appropriate method for calculating the Tc. For sheet flow segments, no longer than 50’ is used in the analysis though shorter lengths are used where logical (transition of ground cover e.g. paved to grass, etc.) Tc values for subcatchments that resulted in less than 6-minutes/inch were direct input at 6-minutes as is standard practice. Subcatchment area take-offs are broken out by ground cover type and hydrologic soil group. Each unique area within a subcatchment is given a runoff curve number (CN) and the areas are summed to result in a weighted CN for the overall subcat. As a single roof runoff/infiltration Subcat & pond have demonstrated that the 3’ wide x 4.0’ deep stone trenches will handle the entire roof runoff for the 50-YR storm without overtopping, the remaining building areas have been eliminated from the model which is the reason the overall area in the proposed model is slightly less than that of the existing. This is demonstrated for the larger buildings (subcat 3S) and the smaller buildings (subcat 9S) in the HydroCAD model.

ANALYSIS COMPONENT PEAK RATE of DISCHARGE (CFS)

	2 YR		10 YR		50YR	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Reach #100	1.08	1.05	6.63	6.61	20.23	19.94
Reach #200	0.00	0.00	0.01	0.01	0.26	0.26

ANALYSIS COMPONENT VOLUME (AF)
 2 YR

	Existing	Proposed
Reach #100	0.327	0.301
Reach #200	0.000	0.000

The existing property is located on a parcel consisting of an existing dwelling, agricultural fields, excavated and natural wetlands, and forested areas. The existing topography is such that the site analysis is divided into three subcatchments. These reaches flow offsite to culverts/swales in the Salmon Falls ROW, southeast to an adjacent parcel, and finally southwest to a very large wetland complex that is the remaining acreage of the parent parcel.

The proposed development includes 1,750 l.f. of proposed 20' wide paved road to serve the new units, underground utilities, onsite well & septic systems, fire suppression, and drainage structures. The proposed layout results in twenty different subcatchments. The overall storm water volume from the site is reduced or equal to existing at both analysis points under the 2-YR storm event. The peak rate of run-off from the proposed development is equal to or decreased from that of the existing conditions at all analysis points. The addition of swales, culverts, bioretention ponds, a wet pond and deep sump catch basins maintain the existing drainage patterns and surface water hydrology to the extent possible. Impervious area runoff receives treatment through bioretention pond and wet pond prior to release toward the analysis points. The proposed bioretention ponds provide for reducing potential pollutants in storm water by: 99% of total suspended solids; 58+% of total petroleum hydrocarbons in the diesel range; 99+% of total zinc; 29% of Dissolved inorganic Nitrogen, and 5+% of total phosphorous. Pre-treatment will be provided by deep sump catch basins and sediment forebays upstream of the ponds. The use of Best Management Practices per the NH Stormwater Manual has been applied to the design of these structures and will be observed during all stages of construction. All land disturbed during construction will be permanently stabilized within 60 days of groundbreaking, and abutting property owners will suffer no adversity resulting from this development.

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Design Method Objectives

USGS Quadrangle

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3.0	Proposed Subdivision Analysis	Pages 1-2
4.0	Sediment & Erosion Control, BMP's	Pages 2-5
5.0	Conclusion	Page 5

Appendix I - Existing Conditions Analysis

Existing Conditions Analysis

Summary 2 YR - 24 HR rainfall = 3.08"

Complete 10 YR - 24 HR rainfall = 4.64"

Summary 50 YR - 24 HR rainfall = 7.00"

Sheet W-1 Existing Conditions Watershed Plan

Appendix II - Proposed Conditions Analysis

Proposed Conditions Analysis

Summary 2 YR - 24 HR rainfall = 3.08"

Complete 10 YR - 24 HR rainfall = 4.64"

Summary 50 YR - 24 HR rainfall = 7.00"

Sheet W-2 Proposed Conditions Watershed Plan

Appendix III - Charts, Graphs, and Calculations

1.0 RAINFALL CHARACTERISTICS

This drainage report includes an existing conditions analysis of the area involved in the proposed development, as well as proposed conditions, or post-construction analysis of the same location. These analyses were accomplished using the USDA SCS TR-20 Method within the HydroCAD Stormwater Modeling System. The curve numbers were developed using the SCS TR-55 Runoff Curve numbers for Urban Areas. A Type III SCS 24-hour rainfall distribution was utilized in analyzing the data for the 2, 10 & 50 Yr. – 24 Hr. storm events. The purpose of this analysis is to estimate the peak rates of run-off from the site for swale adequacy purposes, and to compare the peak rate of run-off between the existing and proposed conditions.

ANALYSIS	COMPONENT PEAK RATE of DISCHARGE (CFS)					
	2 YR		10 YR		50YR	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Reach #100	1.08	1.05	6.63	6.61	20.23	19.94
Reach #200	0.00	0.00	0.01	0.01	0.26	0.26

ANALYSIS COMPONENT VOLUME (AF)

	2 YR	
	Existing	Proposed
Reach #100	0.327	0.301
Reach #200	0.000	0.000

2.0 EXISTING CONDITIONS

Reference: Sheet W-1, Existing Conditions Watershed Plan (Enclosed)
 Existing Conditions Plans

The existing property is located on a parcel consisting of forested woodlands, woods roads, and natural wetland areas. The existing topography is such that the site analysis is divided into four subcatchments. These reaches flow offsite to the wetland onsite southeast to an adjacent parcel, and ultimately southwest to a large wetland complex that drains into the Mallego Brook.

Classified by SSS Mapping, the land within the drainage analysis is composed of slopes ranging from 0% to 15%, and soils categorized into the Hydrologic Soil Groups (HSG) A, B, C & D. All development is within HSG B soils.

3.0 PROPOSED CONDITIONS

Reference: W-Sheets Proposed Conditions Watershed Plans (Enclosed)
 C Sheets Proposed Conditions Plans

The addition of the impervious area from the proposed road, and individual lot development can cause an increase in the curve number (Cn) and a decrease in the time of concentration (Tc), the

net result being a potential increase in peak rates of run-off from the site. The proposed layout results in twenty different subcatchments. The run-off is directed to swales, catch basins, a bioretention pond and a wet pond modeled through HydroCAD reaches” and “ponds.

The proposed development includes 1,750 l.f. of proposed 20' wide paved road to serve the new units, underground utilities, onsite well & septic systems, fire suppression, and drainage structures. The proposed layout results in twenty different subcatchments. The overall storm water volume from the site is reduced or equal to existing at both analysis points under the 2-YR storm event. The peak rate of run-off from the proposed development is equal to or decreased from that of the existing conditions at all analysis points. The addition of swales, culverts, bioretention ponds, a wet pond and deep sump catch basins maintain the existing drainage patterns and surface water hydrology to the extent possible. Impervious area runoff receives treatment through bioretention pond and wet pond prior to release toward the analysis points. The proposed bioretention ponds provide for reducing potential pollutants in storm water by: 99% of total suspended solids; 58+% of total petroleum hydrocarbons in the diesel range; 99+% of total zinc; 29% of Dissolved inorganic Nitrogen, and 5+% of total phosphorous. Pre-treatment will be provided by deep sump catch basins and sediment forebays upstream of the ponds. The use of Best Management Practices per the NH Stormwater Manual has been applied to the design of these structures and will be observed during all stages of construction. All land disturbed during construction will be permanently stabilized within 60 days of groundbreaking, and abutting property owners will suffer no adversity resulting from this development.

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

Reference: P Sheets Proposed Conditions Plan
E Sheet Erosion & Sediment Control Details

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 NH Stormwater Manual. Any area disturbed by construction will be permanently re-stabilized within 60 days and abutting properties 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 Fence / Construction Fence or Compost Berm

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

4.2 Drainage Swales / Stormwater Conveyance Channels

Drainage swales will be stabilized with vegetation for long term cover as outlined below, and on Sheet E-1 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.

4.3 Vegetated Stabilization

All areas that are disturbed during construction will be stabilized with vegetated material within 60 days of breaking ground. Construction will be managed in such a manner that erosion is prevented and that no abutter's property will be subjected to any siltation. All areas to be planted with grass for long-term cover will follow the specification and on Sheet E-1 using seeding mixture C, as follows:

Mixture	Pounds per Acre	Pounds per 1,000 Sq. Ft.
Tall Fescue	20	0.45
<u>Creeping Red Fescue</u>	<u>28</u>	<u>0.65</u>
Total	48	1.10

4.4 Stabilized Construction Entrance

A temporary gravel construction entrance provides an area where mud can be dislodged from tires before the vehicle leaves the construction site. Mud and sediment should not be transported onto paved municipal and state roads. If mud and sediment becomes excessive, the Contractor shall be responsible for regular sweeping. The stone size for the 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. A plan view and profile are shown on Sheet E1 - Sediment and Erosion Control Detail Plan.

4.5 Environmental Dust Control

Dust will be controlled on the site by the use of 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.

4.6 Construction Sequence

1. Construct and/or install temporary and permanent sediment erosion and detention control facilities (silt fence, vegetated swales, level spreaders, and constructed filter strips), 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.

2. Clear, cut, grub, and dispose of debris in approved facilities.
3. Excavate and stockpile topsoil / loam. All disturbed areas shall be stabilized immediately after grading.
4. Construct the roadway and its associated drainage structures.
5. Begin permanent and temporary seeding and mulching. All cut and fill slopes and disturbed areas shall be seeded and mulched as required, or directed.
6. 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.
7. Inspect and maintain all erosion and sediment control measures during construction every two weeks and after every storm event with 0.5" or more rain.
8. Complete permanent seeding and landscaping.
9. Remove temporary erosion control measures after seeding areas have established themselves and site improvements are complete. Smooth and re-vegetate all disturbed areas.
10. All swales and drainage structures will be constructed and stabilized prior to having run-off being directed to them.
11. Finish graveling all roadways/parking.

4.7 Temporary Erosion Control Measures

1. The smallest practical area of land shall be exposed at any one time.
2. Erosion, 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 fences and other barriers shall be inspected periodically and after every rainstorm during the life of the project. All damaged areas shall be repaired; 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.

4.8 Inspection and Maintenance Schedule

1. Fencing will be inspected during and after storm events to ensure that the fence still has integrity and is not allowing sediment to pass. Sediment build-up in swales will be removed if it is deeper than six inches.
2. Gravel wetland systems should be inspected at least twice per year and following any rain event of 2.5" or greater in a 24-hr period. Inspect soil and repair eroded areas monthly, & re-mulch void areas as needed. Remove litter and debris at least twice per year. Treat diseased vegetation as needed. Remove and replace dead vegetation twice per year (spring and fall.) Proper selection of plant species and support during establishment of vegetation should minimize—if not eliminate—the need for fertilizers and pesticides. Remove invasive species as needed to prevent these species from spreading into the bioretention area. Replace mulch every two years, in the early spring. Upon failure, excavate bioretention area, scarify bottom and sides, replace filter fabric and soil, replant, and mulch.
3. Deep sump catch basins shall be inspected monthly and cleaned per manufacturer recommendations. At least twice per year and after each storm in excess of 0.5" of rain, sediment should be removed from trapping devices when it has reached one half of the depth of the trap.
4. Inlets should be inspected annually and after every major storm. Accumulated debris and sediment should be removed as needed; Pipes should be inspected and repaired as necessary.
5. Outlets should be inspected annually and after every major storm. The condition of pipes should be noted and repaired as needed. If erosion is taking place, then measures should be taken to stabilize and protect the affected area.

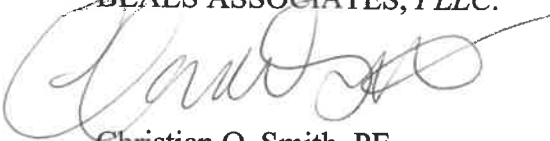
5.0 CONCLUSION

This proposed development off Route 9 in Barrington, NH will have no adverse effect on the abutting property owners by way of storm water run-off or siltation. The post-construction peak rate of run-off from the site toward abutting parcels will be decreased from that of the existing conditions and impervious run-off flow will be treated appropriately prior to discharge. Appropriate steps will be taken to eliminate erosion and sedimentation; these will be accomplished through the construction of a drainage system consisting of swales, catch basins and BMP treatment 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.

A Site Specific, Terrain Alteration Permit (RSA 485: A-17) is required for this project due to the area of disturbance being greater than 100,000 square feet.

Respectfully Submitted,

BEALS ASSOCIATES, *PLLC.*

A handwritten signature in cursive script, appearing to read 'C. Smith', written in black ink over the printed name.

Christian O. Smith, PE
Principal

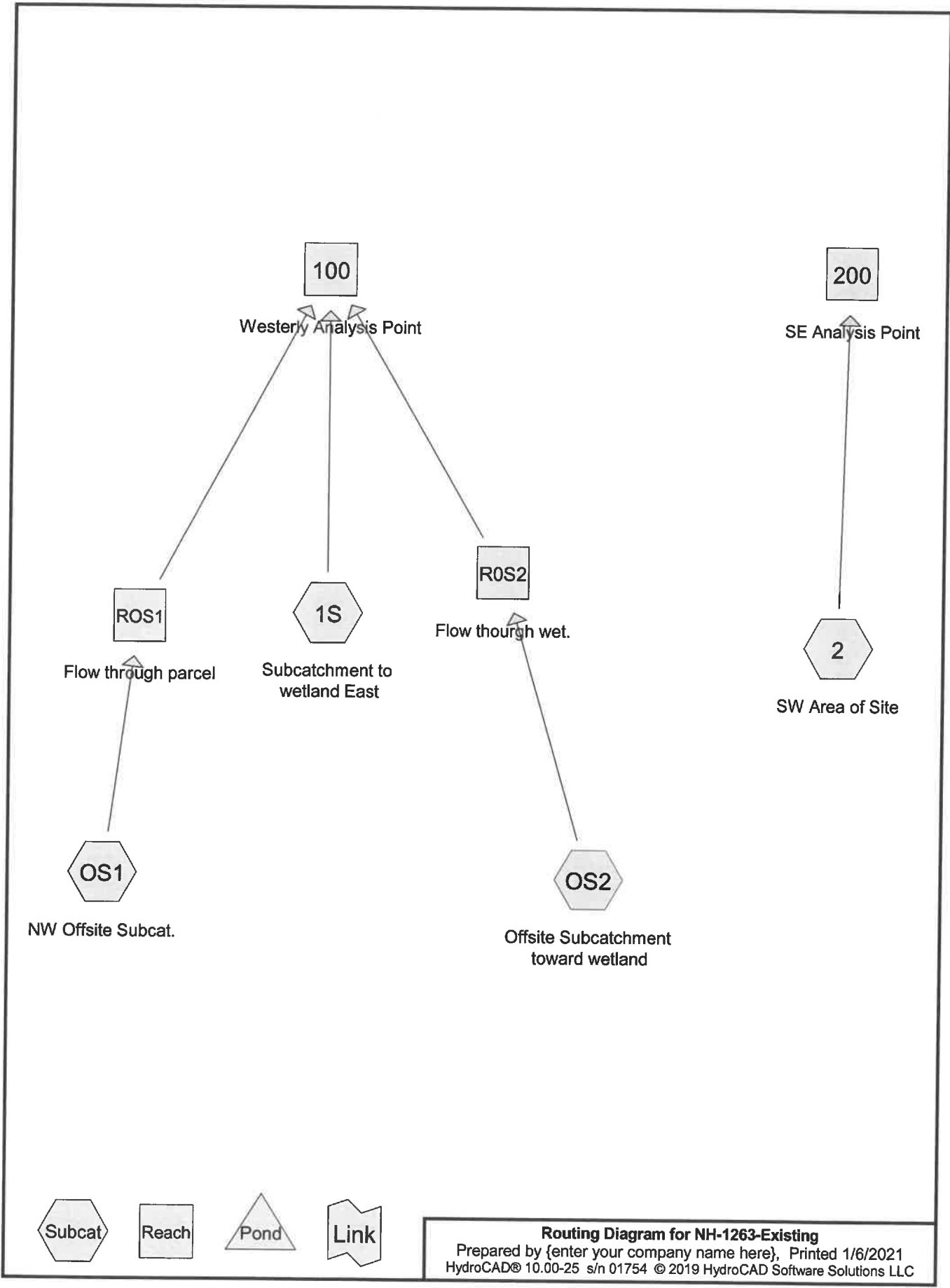
APPENDIX I

Existing Conditions Drainage Analysis

Summary 2 YR - 24 HR rainfall = 3.08"

Summary 10 YR - 24 HR rainfall = 4.64"

Complete 50 YR - 24 HR rainfall = 7.00"



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.656	51	1 acre lots, 20% imp, HSG A (OS2)
0.892	39	>75% Grass cover, Good, HSG A (OS1)
0.447	96	Gravel surface, HSG B (1S)
0.176	70	Woods, Good, HSG C (1S)
0.361	77	Woods, Good, HSG D (1S)
19.416	32	Woods/grass comb., Good, HSG A (1S, 2, OS1, OS2)
12.672	58	Woods/grass comb., Good, HSG B (1S)
34.620	44	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
20.965	HSG A	1S, 2, OS1, OS2
13.119	HSG B	1S
0.176	HSG C	1S
0.361	HSG D	1S
0.000	Other	
34.620		TOTAL AREA

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Route 9, Barrington

Type III 24-hr 2 YR Rainfall=3.08"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment to Runoff Area=703,941 sf 0.00% Impervious Runoff Depth=0.24"
Flow Length=942' Tc=37.1 min CN=56 Runoff=1.08 cfs 0.327 af

Subcatchment 2: SW Area of Site Runoff Area=225,026 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=653' Tc=32.0 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment OS1: NW Offsite Subcat. Runoff Area=215,064 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=665' Tc=37.6 min CN=33 Runoff=0.00 cfs 0.000 af

Subcatchment OS2: Offsite Subcatchment Runoff Area=364,021 sf 1.57% Impervious Runoff Depth=0.00"
Flow Length=473' Tc=29.1 min CN=33 Runoff=0.00 cfs 0.000 af

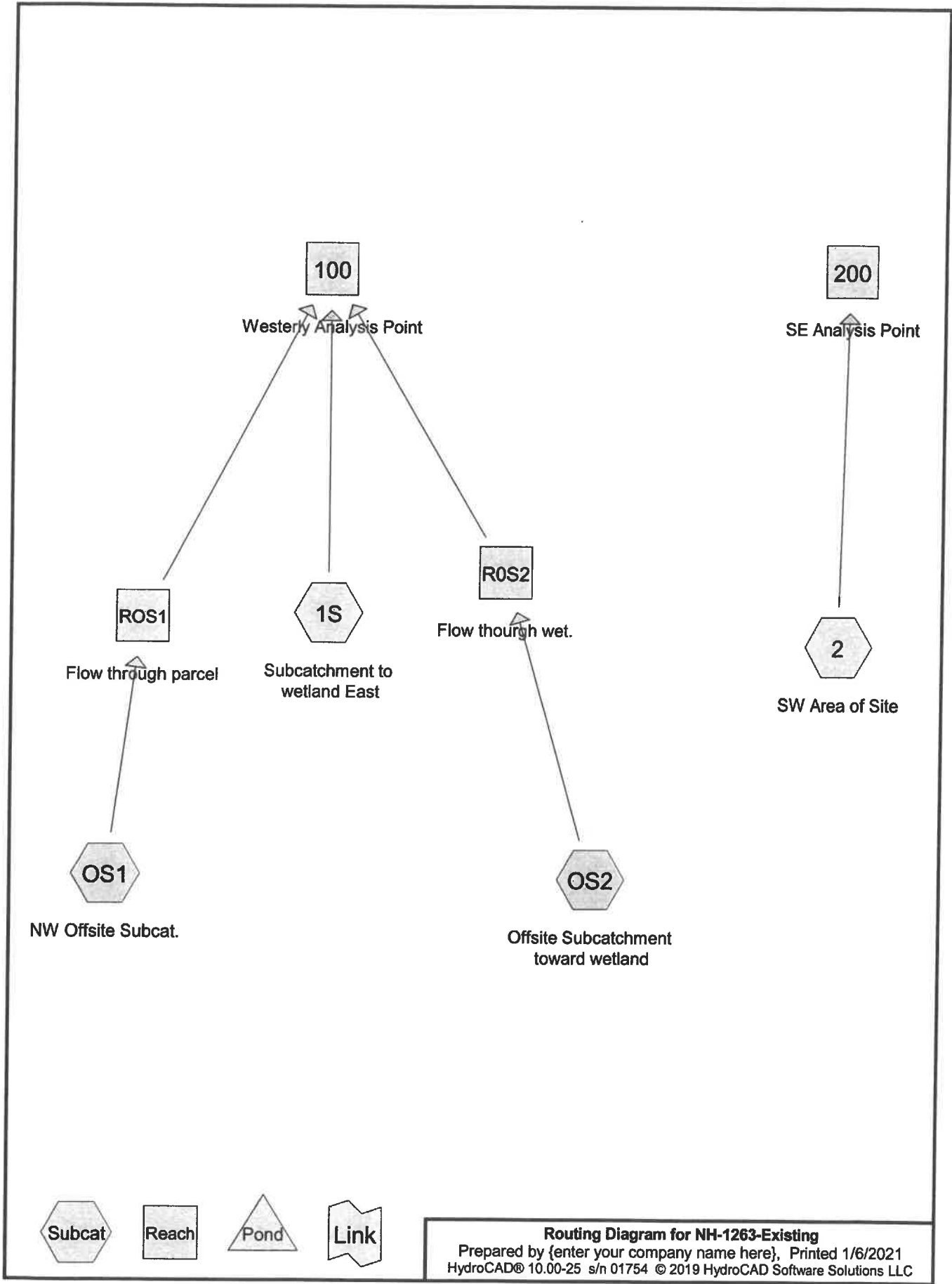
Reach 100: Westerly Analysis Point Inflow=1.08 cfs 0.327 af
Outflow=1.08 cfs 0.327 af

Reach 200: SE Analysis Point Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Reach R0S2: Flow through wet. Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.040 L=756.0' S=0.0159 '/' Capacity=22.49 cfs Outflow=0.00 cfs 0.000 af

Reach ROS1: Flow through parcel Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.040 L=909.0' S=0.0215 '/' Capacity=26.15 cfs Outflow=0.00 cfs 0.000 af

Total Runoff Area = 34.620 ac Runoff Volume = 0.327 af Average Runoff Depth = 0.11"
99.62% Pervious = 34.489 ac 0.38% Impervious = 0.131 ac



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Route 9, Barrington
Type III 24-hr 10 YR Rainfall=4.64"

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Page 5

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment to Runoff Area=703,941 sf 0.00% Impervious Runoff Depth=0.86"
Flow Length=942' Tc=37.1 min CN=56 Runoff=6.63 cfs 1.161 af

Subcatchment 2: SW Area of Site Runoff Area=225,026 sf 0.00% Impervious Runoff Depth=0.01"
Flow Length=653' Tc=32.0 min CN=32 Runoff=0.01 cfs 0.003 af

Subcatchment OS1: NW Offsite Subcat. Runoff Area=215,064 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=665' Tc=37.6 min CN=33 Runoff=0.01 cfs 0.007 af

Subcatchment OS2: Offsite Subcatchment Runoff Area=364,021 sf 1.57% Impervious Runoff Depth=0.02"
Flow Length=473' Tc=29.1 min CN=33 Runoff=0.02 cfs 0.011 af

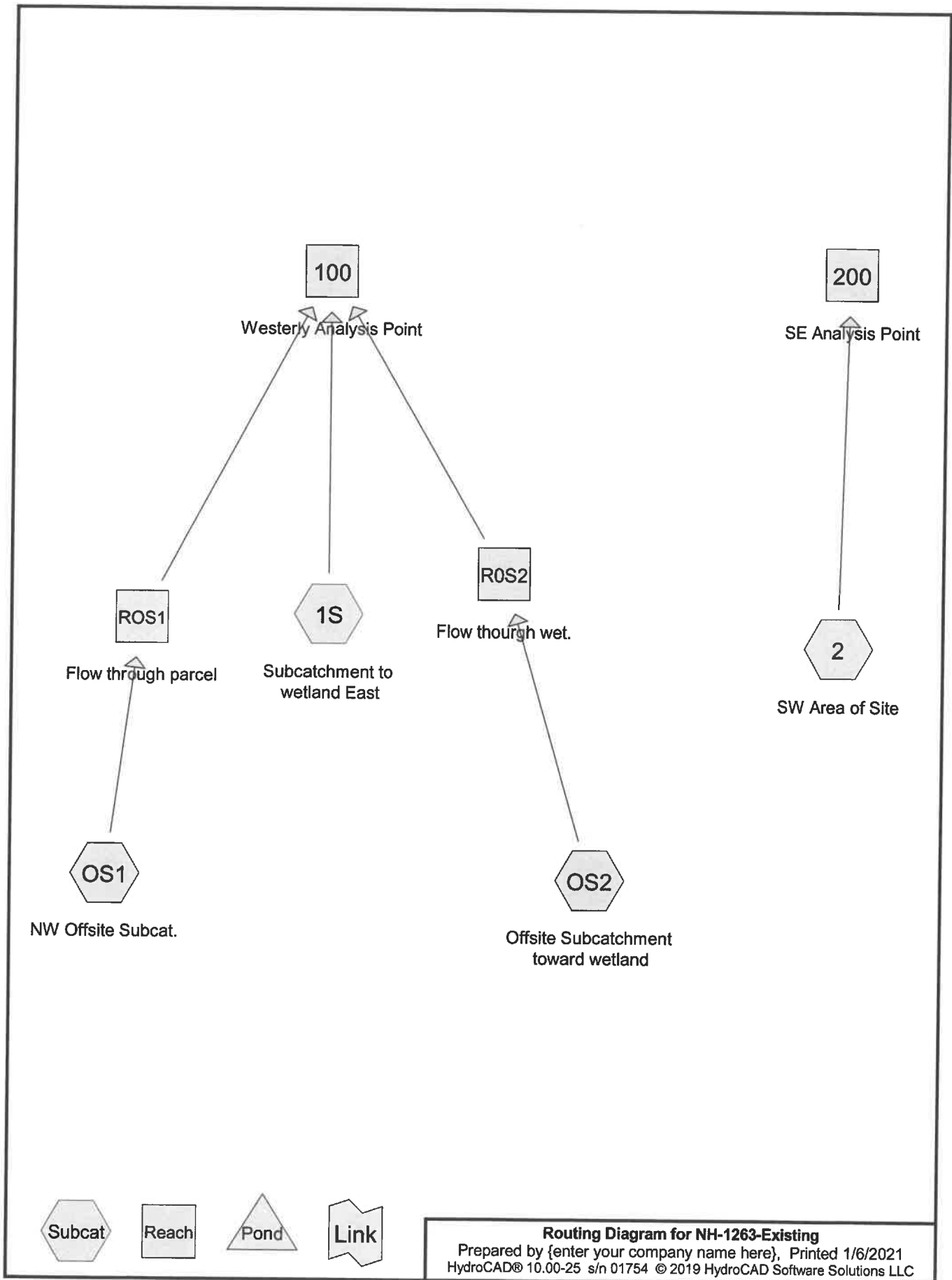
Reach 100: Westerly Analysis Point Inflow=6.63 cfs 1.178 af
Outflow=6.63 cfs 1.178 af

Reach 200: SE Analysis Point Inflow=0.01 cfs 0.003 af
Outflow=0.01 cfs 0.003 af

Reach R0S2: Flow through wet. Avg. Flow Depth=0.02' Max Vel=0.26 fps Inflow=0.02 cfs 0.011 af
n=0.040 L=756.0' S=0.0159 '/ Capacity=22.49 cfs Outflow=0.02 cfs 0.011 af

Reach ROS1: Flow through parcel Avg. Flow Depth=0.01' Max Vel=0.24 fps Inflow=0.01 cfs 0.007 af
n=0.040 L=909.0' S=0.0215 '/ Capacity=26.15 cfs Outflow=0.01 cfs 0.007 af

Total Runoff Area = 34.620 ac Runoff Volume = 1.181 af Average Runoff Depth = 0.41"
99.62% Pervious = 34.489 ac 0.38% Impervious = 0.131 ac



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Route 9, Barrington
Type III 24-hr 50 YR Rainfall=7.00"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment to Runoff Area=703,941 sf 0.00% Impervious Runoff Depth=2.22"
Flow Length=942' Tc=37.1 min CN=56 Runoff=20.23 cfs 2.987 af

Subcatchment 2: SW Area of Site Runoff Area=225,026 sf 0.00% Impervious Runoff Depth=0.32"
Flow Length=653' Tc=32.0 min CN=32 Runoff=0.26 cfs 0.136 af

Subcatchment OS1: NW Offsite Subcat. Runoff Area=215,064 sf 0.00% Impervious Runoff Depth=0.37"
Flow Length=665' Tc=37.6 min CN=33 Runoff=0.34 cfs 0.153 af

Subcatchment OS2: Offsite Subcatchment Runoff Area=364,021 sf 1.57% Impervious Runoff Depth=0.37"
Flow Length=473' Tc=29.1 min CN=33 Runoff=0.63 cfs 0.259 af

Reach 100: Westerly Analysis Point Inflow=20.35 cfs 3.399 af
Outflow=20.35 cfs 3.399 af

Reach 200: SE Analysis Point Inflow=0.26 cfs 0.136 af
Outflow=0.26 cfs 0.136 af

Reach R0S2: Flow through wet. Avg. Flow Depth=0.09' Max Vel=0.72 fps Inflow=0.63 cfs 0.259 af
n=0.040 L=756.0' S=0.0159 '/' Capacity=22.49 cfs Outflow=0.54 cfs 0.259 af

Reach ROS1: Flow through parcel Avg. Flow Depth=0.06' Max Vel=0.66 fps Inflow=0.34 cfs 0.153 af
n=0.040 L=909.0' S=0.0215 '/' Capacity=26.15 cfs Outflow=0.30 cfs 0.153 af

Total Runoff Area = 34.620 ac Runoff Volume = 3.535 af Average Runoff Depth = 1.23"
99.62% Pervious = 34.489 ac 0.38% Impervious = 0.131 ac

NH-1263-Existing

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Route 9, Barrington

Type III 24-hr 50 YR Rainfall=7.00"

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Summary for Subcatchment 1S: Subcatchment to wetland East

Runoff = 20.23 cfs @ 12.57 hrs, Volume= 2.987 af, Depth= 2.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
109,109	32	Woods/grass comb., Good, HSG A
551,984	58	Woods/grass comb., Good, HSG B
7,649	70	Woods, Good, HSG C
15,714	77	Woods, Good, HSG D
19,485	96	Gravel surface, HSG B
703,941	56	Weighted Average
703,941		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0110	0.05		Sheet Flow, Sheet Woods: Light underbrush n= 0.400 P2= 3.00"
5.2	309	0.0388	0.98		Shallow Concentrated Flow, SC to wetland Woodland Kv= 5.0 fps
15.7	583	0.0154	0.62		Shallow Concentrated Flow, SC to PL Woodland Kv= 5.0 fps
37.1	942	Total			

Summary for Subcatchment 2: SW Area of Site

Runoff = 0.26 cfs @ 12.98 hrs, Volume= 0.136 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
225,026	32	Woods/grass comb., Good, HSG A
225,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	50	0.0120	0.05		Sheet Flow, Sheet Woods: Light underbrush n= 0.400 P2= 3.00"
16.4	603	0.0150	0.61		Shallow Concentrated Flow, Sc to analysis point Woodland Kv= 5.0 fps
32.0	653	Total			

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Type III 24-hr 50 YR Rainfall=7.00"

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Summary for Subcatchment OS1: NW Offsite Subcat.

Runoff = 0.34 cfs @ 12.99 hrs, Volume= 0.153 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
38,877	39	>75% Grass cover, Good, HSG A
176,187	32	Woods/grass comb., Good, HSG A
215,064	33	Weighted Average
215,064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0100	0.05		Sheet Flow, Sheet
20.8	615	0.0097	0.49		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC to PL
					Woodland Kv= 5.0 fps
37.6	665	Total			

Summary for Subcatchment OS2: Offsite Subcatchment toward wetland

Runoff = 0.63 cfs @ 12.78 hrs, Volume= 0.259 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
335,438	32	Woods/grass comb., Good, HSG A
28,583	51	1 acre lots, 20% imp, HSG A
364,021	33	Weighted Average
358,304		98.43% Pervious Area
5,717		1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0110	0.05		Sheet Flow, Sheet
12.9	423	0.0120	0.55		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC to PL
					Woodland Kv= 5.0 fps
29.1	473	Total			

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Summary for Reach 100: Westerly Analysis Point

Inflow Area = 29.454 ac, 0.45% Impervious, Inflow Depth = 1.38" for 50 YR event
Inflow = 20.35 cfs @ 12.57 hrs, Volume= 3.399 af
Outflow = 20.35 cfs @ 12.57 hrs, Volume= 3.399 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach 200: SE Analysis Point

Inflow Area = 5.166 ac, 0.00% Impervious, Inflow Depth = 0.32" for 50 YR event
Inflow = 0.26 cfs @ 12.98 hrs, Volume= 0.136 af
Outflow = 0.26 cfs @ 12.98 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach ROS2: Flow through wet.

Inflow Area = 8.357 ac, 1.57% Impervious, Inflow Depth = 0.37" for 50 YR event
Inflow = 0.63 cfs @ 12.78 hrs, Volume= 0.259 af
Outflow = 0.54 cfs @ 13.17 hrs, Volume= 0.259 af, Atten= 14%, Lag= 23.8 min

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

Max. Velocity= 0.72 fps, Min. Travel Time= 17.6 min

Avg. Velocity = 0.34 fps, Avg. Travel Time= 37.6 min

Peak Storage= 573 cf @ 13.17 hrs

Average Depth at Peak Storage= 0.09'

Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 22.49 cfs

30.00' x 0.50' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals

Length= 756.0' Slope= 0.0159 1'

Inlet Invert= 192.00', Outlet Invert= 180.00'



Summary for Reach ROS1: Flow through parcel

Inflow Area = 4.937 ac, 0.00% Impervious, Inflow Depth = 0.37" for 50 YR event
Inflow = 0.34 cfs @ 12.99 hrs, Volume= 0.153 af
Outflow = 0.30 cfs @ 13.48 hrs, Volume= 0.153 af, Atten= 13%, Lag= 29.6 min

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

Max. Velocity= 0.66 fps, Min. Travel Time= 23.0 min

Avg. Velocity = 0.33 fps, Avg. Travel Time= 46.4 min

Peak Storage= 409 cf @ 13.48 hrs

Average Depth at Peak Storage= 0.06'

Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 26.15 cfs

30.00' x 0.50' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals

Length= 909.0' Slope= 0.0215 '/'

Inlet Invert= 198.50', Outlet Invert= 179.00'



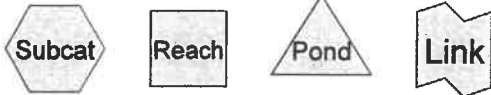
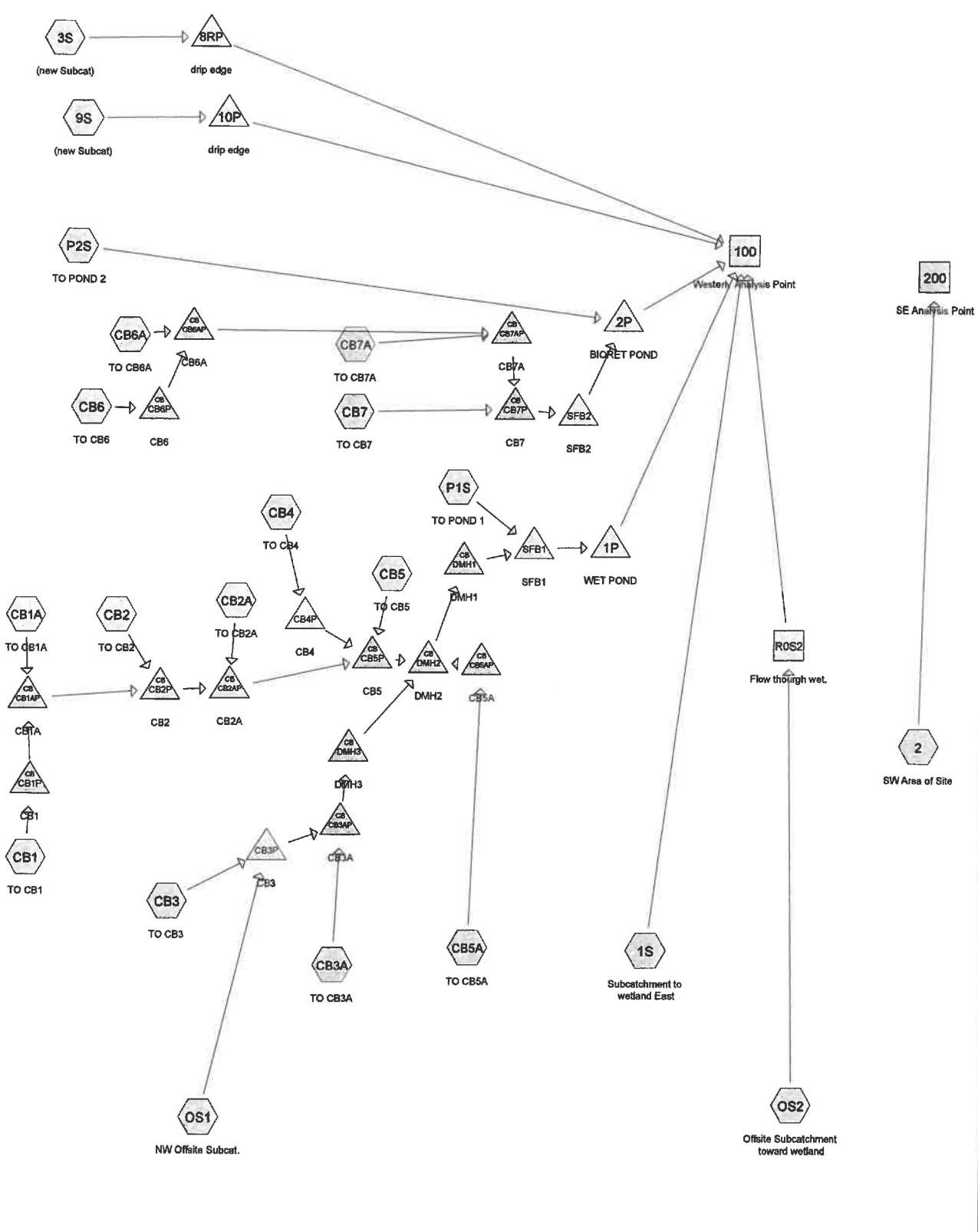
APPENDIX II

Proposed Conditions Drainage Analysis

Summary 2 YR - 24 HR rainfall = 3.08"

Summary 10 YR - 24 HR rainfall = 4.64"

Complete 50 YR - 24 HR rainfall = 7.00"



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.656	51	1 acre lots, 20% imp, HSG A (OS2)
0.892	39	>75% Grass cover, Good, HSG A (OS1)
3.361	61	>75% Grass cover, Good, HSG B (1S, 3S, 9S, CB1, CB1A, CB2, CB2A, CB3, CB3A, CB4, CB5, CB5A, CB6, CB6A, CB7, CB7A, P1S, P2S)
0.309	96	Gravel surface, HSG B (1S)
0.013	98	Paved parking, HSG B (P1S)
2.118	98	Paved roads w/curbs & sewers, HSG B (CB1, CB1A, CB2, CB2A, CB3A, CB5, CB5A, CB6, CB6A, CB7, CB7A)
0.125	98	Roofs, HSG B (3S, 9S)
0.140	55	Woods, Good, HSG B (CB4)
0.176	70	Woods, Good, HSG C (1S)
0.361	77	Woods, Good, HSG D (1S)
19.416	32	Woods/grass comb., Good, HSG A (1S, 2, OS1, OS2)
5.919	58	Woods/grass comb., Good, HSG B (1S, CB1, CB1A, CB2, CB3, CB3A, P2S)
33.484	46	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
20.965	HSG A	1S, 2, OS1, OS2
11.983	HSG B	1S, 3S, 9S, CB1, CB1A, CB2, CB2A, CB3, CB3A, CB4, CB5, CB5A, CB6, CB6A, CB7, CB7A, P1S, P2S
0.176	HSG C	1S
0.361	HSG D	1S
0.000	Other	
33.484		TOTAL AREA

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchmentto	Runoff Area=353,873 sf 0.00% Impervious Runoff Depth=0.17" Flow Length=868' Tc=36.2 min CN=53 Runoff=0.26 cfs 0.114 af
Subcatchment2: SW Area of Site	Runoff Area=225,026 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=653' Tc=32.0 min CN=32 Runoff=0.00 cfs 0.000 af
Subcatchment3S: (new Subcat)	Runoff Area=3,218 sf 85.52% Impervious Runoff Depth=2.33" Tc=6.0 min CN=93 Runoff=0.20 cfs 0.014 af
Subcatchment9S: (new Subcat)	Runoff Area=3,126 sf 85.48% Impervious Runoff Depth=2.33" Tc=6.0 min CN=93 Runoff=0.19 cfs 0.014 af
SubcatchmentCB1: TO CB1	Runoff Area=18,997 sf 15.42% Impervious Runoff Depth=0.54" Flow Length=148' Tc=20.6 min CN=65 Runoff=0.14 cfs 0.020 af
SubcatchmentCB1A: TO CB1A	Runoff Area=10,873 sf 23.04% Impervious Runoff Depth=0.67" Flow Length=79' Tc=17.1 min CN=68 Runoff=0.12 cfs 0.014 af
SubcatchmentCB2: TO CB2	Runoff Area=42,049 sf 26.32% Impervious Runoff Depth=0.76" Flow Length=331' Tc=24.8 min CN=70 Runoff=0.46 cfs 0.061 af
SubcatchmentCB2A: TO CB2A	Runoff Area=8,663 sf 77.78% Impervious Runoff Depth=2.06" Tc=6.0 min CN=90 Runoff=0.48 cfs 0.034 af
SubcatchmentCB3: TO CB3	Runoff Area=30,351 sf 0.00% Impervious Runoff Depth=0.33" Flow Length=490' Tc=22.7 min CN=59 Runoff=0.10 cfs 0.019 af
SubcatchmentCB3A: TO CB3A	Runoff Area=38,359 sf 55.17% Impervious Runoff Depth=1.38" Flow Length=322' Tc=20.4 min CN=81 Runoff=0.94 cfs 0.101 af
SubcatchmentCB4: TO CB4	Runoff Area=25,708 sf 0.00% Impervious Runoff Depth=0.36" Flow Length=289' Tc=16.0 min CN=60 Runoff=0.10 cfs 0.018 af
SubcatchmentCB5: TO CB5	Runoff Area=10,880 sf 96.03% Impervious Runoff Depth=2.74" Tc=6.0 min CN=97 Runoff=0.73 cfs 0.057 af
SubcatchmentCB5A: TO CB5A	Runoff Area=14,821 sf 93.22% Impervious Runoff Depth=2.53" Flow Length=383' Tc=19.1 min CN=95 Runoff=0.66 cfs 0.072 af
SubcatchmentCB6: TO CB6	Runoff Area=6,341 sf 60.48% Impervious Runoff Depth=1.51" Tc=6.0 min CN=83 Runoff=0.26 cfs 0.018 af
SubcatchmentCB6A: TO CB6A	Runoff Area=10,597 sf 90.97% Impervious Runoff Depth=2.53" Tc=6.0 min CN=95 Runoff=0.68 cfs 0.051 af
SubcatchmentCB7: TO CB7	Runoff Area=5,468 sf 80.78% Impervious Runoff Depth=2.15" Tc=6.0 min CN=91 Runoff=0.31 cfs 0.022 af

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Subcatchment CB7A: TO CB7A	Runoff Area=8,246 sf 68.91% Impervious Runoff Depth=1.73" Tc=6.0 min CN=86 Runoff=0.38 cfs 0.027 af
Subcatchment OS1: NW Offsite Subcat.	Runoff Area=215,064 sf 0.00% Impervious Runoff Depth=0.00" Flow Length=665' Tc=37.6 min CN=33 Runoff=0.00 cfs 0.000 af
Subcatchment OS2: Offsite Subcatchment	Runoff Area=364,021 sf 1.57% Impervious Runoff Depth=0.00" Flow Length=473' Tc=29.1 min CN=33 Runoff=0.00 cfs 0.000 af
Subcatchment P1S: TO POND 1	Runoff Area=18,353 sf 3.07% Impervious Runoff Depth=0.43" Flow Length=123' Tc=12.3 min CN=62 Runoff=0.11 cfs 0.015 af
Subcatchment P2S: TO POND 2	Runoff Area=44,538 sf 0.00% Impervious Runoff Depth=0.36" Flow Length=580' Tc=34.6 min CN=60 Runoff=0.14 cfs 0.031 af
Reach 100: Westerly Analysis Point	Inflow=1.05 cfs 0.301 af Outflow=1.05 cfs 0.301 af
Reach 200: SE Analysis Point	Inflow=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af
Reach R0S2: Flow through wet.	Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af n=0.040 L=756.0' S=0.0159 '/ Capacity=22.49 cfs Outflow=0.00 cfs 0.000 af
Pond 1P: WET POND	Peak Elev=189.58' Storage=11,109 cf Inflow=1.01 cfs 0.298 af Outflow=0.82 cfs 0.297 af
Pond 2P: BIORET POND	Peak Elev=188.20' Storage=1,366 cf Inflow=1.63 cfs 0.140 af Discarded=0.34 cfs 0.140 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.140 af
Pond 8RP: drip edge	Peak Elev=198.94' Storage=175 cf Inflow=0.20 cfs 0.014 af Discarded=0.03 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.014 af
Pond 10P: drip edge	Peak Elev=198.93' Storage=170 cf Inflow=0.19 cfs 0.014 af Discarded=0.03 cfs 0.014 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.014 af
Pond CB1AP: CB1A	Peak Elev=194.62' Inflow=0.25 cfs 0.034 af 15.0" Round Culvert n=0.013 L=148.0' S=0.0100 '/ Outflow=0.25 cfs 0.034 af
Pond CB1P: CB1	Peak Elev=194.81' Inflow=0.14 cfs 0.020 af 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/ Outflow=0.14 cfs 0.020 af
Pond CB2AP: CB2A	Peak Elev=192.67' Inflow=0.88 cfs 0.129 af 15.0" Round Culvert n=0.013 L=162.0' S=0.0100 '/ Outflow=0.88 cfs 0.129 af
Pond CB2P: CB2	Peak Elev=193.22' Inflow=0.71 cfs 0.095 af 15.0" Round Culvert n=0.013 L=48.0' S=0.0100 '/ Outflow=0.71 cfs 0.095 af
Pond CB3AP: CB3A	Peak Elev=191.62' Inflow=0.94 cfs 0.117 af 18.0" Round Culvert n=0.013 L=33.0' S=0.0100 '/ Outflow=0.94 cfs 0.117 af

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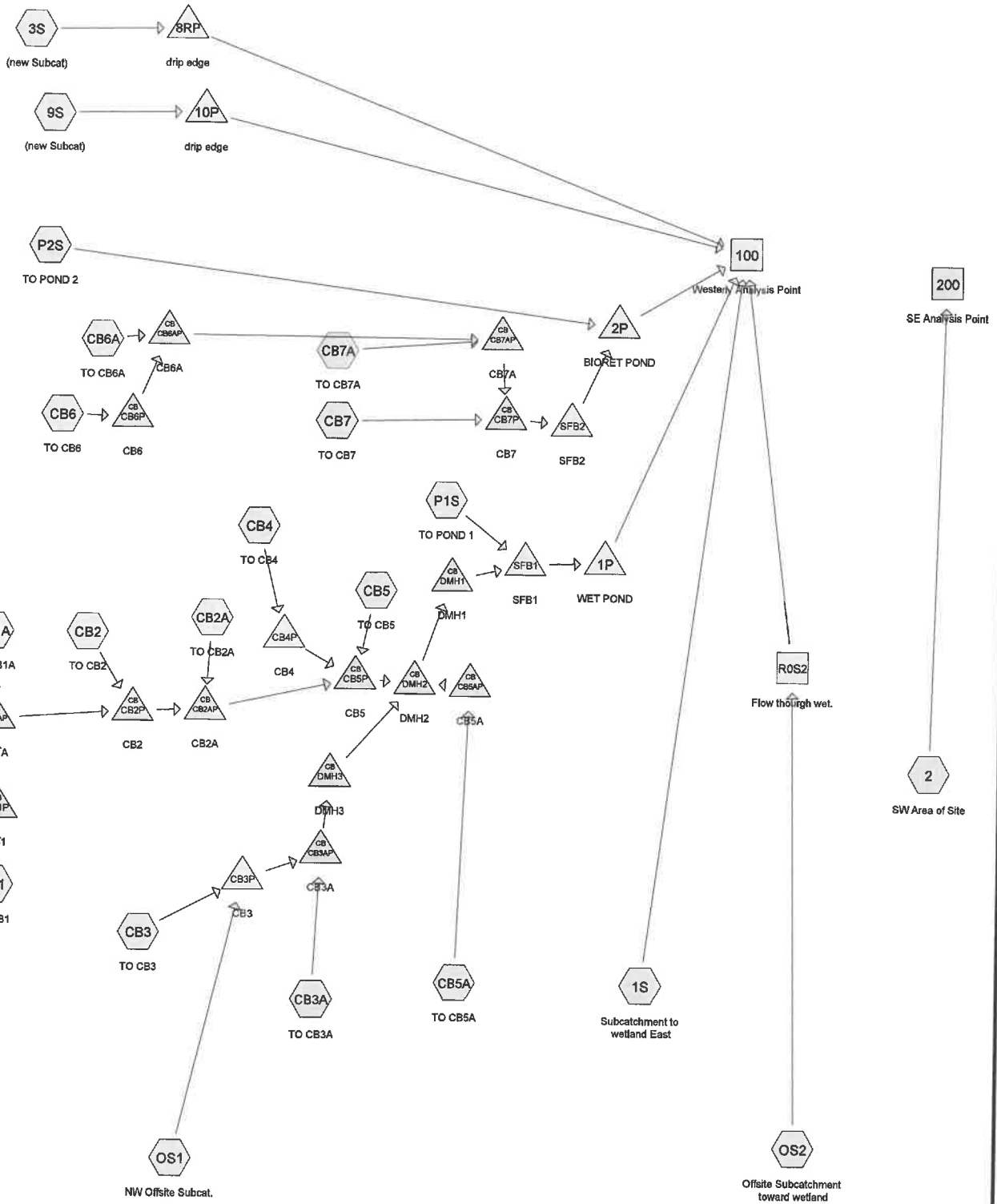
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Pond CB3P: CB3	Peak Elev=193.93' Storage=122 cf Inflow=0.10 cfs 0.019 af Outflow=0.09 cfs 0.016 af
Pond CB4P: CB4	Peak Elev=193.69' Storage=777 cf Inflow=0.10 cfs 0.018 af Outflow=0.00 cfs 0.000 af
Pond CB5AP: CB5A	Peak Elev=190.79' Inflow=0.66 cfs 0.072 af 15.0" Round Culvert n=0.013 L=8.0' S=0.0100 '/ Outflow=0.66 cfs 0.072 af
Pond CB5P: CB5	Peak Elev=190.86' Inflow=1.43 cfs 0.186 af 18.0" Round Culvert n=0.013 L=8.0' S=0.0100 '/ Outflow=1.43 cfs 0.186 af
Pond CB6AP: CB6A	Peak Elev=193.29' Inflow=0.94 cfs 0.070 af 15.0" Round Culvert n=0.013 L=182.0' S=0.0060 '/ Outflow=0.94 cfs 0.070 af
Pond CB6P: CB6	Peak Elev=193.45' Inflow=0.26 cfs 0.018 af 15.0" Round Culvert n=0.013 L=46.0' S=0.0061 '/ Outflow=0.26 cfs 0.018 af
Pond CB7AP: CB7A	Peak Elev=192.31' Inflow=1.32 cfs 0.097 af 15.0" Round Culvert n=0.013 L=14.0' S=0.0050 '/ Outflow=1.32 cfs 0.097 af
Pond CB7P: CB7	Peak Elev=192.13' Inflow=1.64 cfs 0.119 af 15.0" Round Culvert n=0.013 L=55.0' S=0.0049 '/ Outflow=1.64 cfs 0.119 af
Pond DMH1: DMH1	Peak Elev=190.30' Inflow=2.76 cfs 0.375 af 24.0" Round Culvert n=0.013 L=68.0' S=0.0050 '/ Outflow=2.76 cfs 0.375 af
Pond DMH2: DMH2	Peak Elev=190.76' Inflow=2.76 cfs 0.375 af 24.0" Round Culvert n=0.013 L=66.0' S=0.0050 '/ Outflow=2.76 cfs 0.375 af
Pond DMH3: DMH3	Peak Elev=191.07' Inflow=0.94 cfs 0.117 af 24.0" Round Culvert n=0.013 L=100.0' S=0.0050 '/ Outflow=0.94 cfs 0.117 af
Pond SFB1: SFB1	Peak Elev=189.58' Storage=563 cf Inflow=1.01 cfs 0.296 af Outflow=1.01 cfs 0.296 af
Pond SFB2: SFB2	Peak Elev=191.22' Storage=567 cf Inflow=1.64 cfs 0.119 af Outflow=1.63 cfs 0.109 af

Total Runoff Area = 33.484 ac Runoff Volume = 0.703 af Average Runoff Depth = 0.25"
92.87% Pervious = 31.098 ac 7.13% Impervious = 2.386 ac



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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Subcatchmentto	Runoff Area=353,873 sf 0.00% Impervious Runoff Depth=0.70" Flow Length=868' Tc=36.2 min CN=53 Runoff=2.48 cfs 0.474 af
Subcatchment2: SW Area of Site	Runoff Area=225,026 sf 0.00% Impervious Runoff Depth=0.01" Flow Length=653' Tc=32.0 min CN=32 Runoff=0.01 cfs 0.003 af
Subcatchment3S: (new Subcat)	Runoff Area=3,218 sf 85.52% Impervious Runoff Depth=3.84" Tc=6.0 min CN=93 Runoff=0.31 cfs 0.024 af
Subcatchment9S: (new Subcat)	Runoff Area=3,126 sf 85.48% Impervious Runoff Depth=3.84" Tc=6.0 min CN=93 Runoff=0.31 cfs 0.023 af
SubcatchmentCB1: TO CB1	Runoff Area=18,997 sf 15.42% Impervious Runoff Depth=1.42" Flow Length=148' Tc=20.6 min CN=65 Runoff=0.45 cfs 0.052 af
SubcatchmentCB1A: TO CB1A	Runoff Area=10,873 sf 23.04% Impervious Runoff Depth=1.63" Flow Length=79' Tc=17.1 min CN=68 Runoff=0.33 cfs 0.034 af
SubcatchmentCB2: TO CB2	Runoff Area=42,049 sf 26.32% Impervious Runoff Depth=1.77" Flow Length=331' Tc=24.8 min CN=70 Runoff=1.20 cfs 0.143 af
SubcatchmentCB2A: TO CB2A	Runoff Area=8,663 sf 77.78% Impervious Runoff Depth=3.53" Tc=6.0 min CN=90 Runoff=0.80 cfs 0.059 af
SubcatchmentCB3: TO CB3	Runoff Area=30,351 sf 0.00% Impervious Runoff Depth=1.04" Flow Length=490' Tc=22.7 min CN=59 Runoff=0.46 cfs 0.060 af
SubcatchmentCB3A: TO CB3A	Runoff Area=38,359 sf 55.17% Impervious Runoff Depth=2.67" Flow Length=322' Tc=20.4 min CN=81 Runoff=1.84 cfs 0.196 af
SubcatchmentCB4: TO CB4	Runoff Area=25,708 sf 0.00% Impervious Runoff Depth=1.10" Flow Length=289' Tc=16.0 min CN=60 Runoff=0.48 cfs 0.054 af
SubcatchmentCB5: TO CB5	Runoff Area=10,880 sf 96.03% Impervious Runoff Depth=4.29" Tc=6.0 min CN=97 Runoff=1.12 cfs 0.089 af
SubcatchmentCB5A: TO CB5A	Runoff Area=14,821 sf 93.22% Impervious Runoff Depth=4.06" Flow Length=383' Tc=19.1 min CN=95 Runoff=1.04 cfs 0.115 af
SubcatchmentCB6: TO CB6	Runoff Area=6,341 sf 60.48% Impervious Runoff Depth=2.85" Tc=6.0 min CN=83 Runoff=0.49 cfs 0.035 af
SubcatchmentCB6A: TO CB6A	Runoff Area=10,597 sf 90.97% Impervious Runoff Depth=4.06" Tc=6.0 min CN=95 Runoff=1.07 cfs 0.082 af
SubcatchmentCB7: TO CB7	Runoff Area=5,468 sf 80.78% Impervious Runoff Depth=3.63" Tc=6.0 min CN=91 Runoff=0.51 cfs 0.038 af

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Type III 24-hr 10 YR Rainfall=4.64"

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Subcatchment CB7A: TO CB7A Runoff Area=8,246 sf 68.91% Impervious Runoff Depth=3.13"
Tc=6.0 min CN=86 Runoff=0.69 cfs 0.049 af

Subcatchment OS1: NW Offsite Subcat. Runoff Area=215,064 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=665' Tc=37.6 min CN=33 Runoff=0.01 cfs 0.007 af

Subcatchment OS2: Offsite Subcatchment Runoff Area=364,021 sf 1.57% Impervious Runoff Depth=0.02"
Flow Length=473' Tc=29.1 min CN=33 Runoff=0.02 cfs 0.011 af

Subcatchment P1S: TO POND 1 Runoff Area=18,353 sf 3.07% Impervious Runoff Depth=1.22"
Flow Length=123' Tc=12.3 min CN=62 Runoff=0.44 cfs 0.043 af

Subcatchment P2S: TO POND 2 Runoff Area=44,538 sf 0.00% Impervious Runoff Depth=1.10"
Flow Length=580' Tc=34.6 min CN=60 Runoff=0.61 cfs 0.093 af

Reach 100: Westerly Analysis Point Inflow=6.61 cfs 1.307 af
Outflow=6.61 cfs 1.307 af

Reach 200: SE Analysis Point Inflow=0.01 cfs 0.003 af
Outflow=0.01 cfs 0.003 af

Reach R0S2: Flow through wet. Avg. Flow Depth=0.02' Max Vel=0.26 fps Inflow=0.02 cfs 0.011 af
n=0.040 L=756.0' S=0.0159 '/ Capacity=22.49 cfs Outflow=0.02 cfs 0.011 af

Pond 1P: WET POND Peak Elev=189.82' Storage=12,041 cf Inflow=6.27 cfs 0.823 af
Outflow=5.99 cfs 0.822 af

Pond 2P: BIORET POND Peak Elev=190.06' Storage=4,470 cf Inflow=2.84 cfs 0.287 af
Discarded=0.34 cfs 0.287 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.287 af

Pond 8RP: drip edge Peak Elev=199.90' Storage=354 cf Inflow=0.31 cfs 0.024 af
Discarded=0.03 cfs 0.024 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.024 af

Pond 10P: drip edge Peak Elev=199.89' Storage=344 cf Inflow=0.31 cfs 0.023 af
Discarded=0.03 cfs 0.023 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.023 af

Pond CB1AP: CB1A Peak Elev=194.81' Inflow=0.77 cfs 0.085 af
15.0" Round Culvert n=0.013 L=148.0' S=0.0100 '/ Outflow=0.77 cfs 0.085 af

Pond CB1P: CB1 Peak Elev=194.99' Inflow=0.45 cfs 0.052 af
15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/ Outflow=0.45 cfs 0.052 af

Pond CB2AP: CB2A Peak Elev=192.97' Inflow=2.24 cfs 0.287 af
15.0" Round Culvert n=0.013 L=162.0' S=0.0100 '/ Outflow=2.24 cfs 0.287 af

Pond CB2P: CB2 Peak Elev=193.55' Inflow=1.93 cfs 0.228 af
15.0" Round Culvert n=0.013 L=48.0' S=0.0100 '/ Outflow=1.93 cfs 0.228 af

Pond CB3AP: CB3A Peak Elev=191.95' Inflow=2.26 cfs 0.260 af
18.0" Round Culvert n=0.013 L=33.0' S=0.0100 '/ Outflow=2.26 cfs 0.260 af

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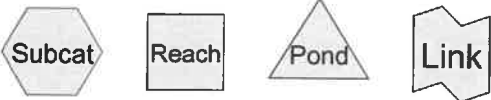
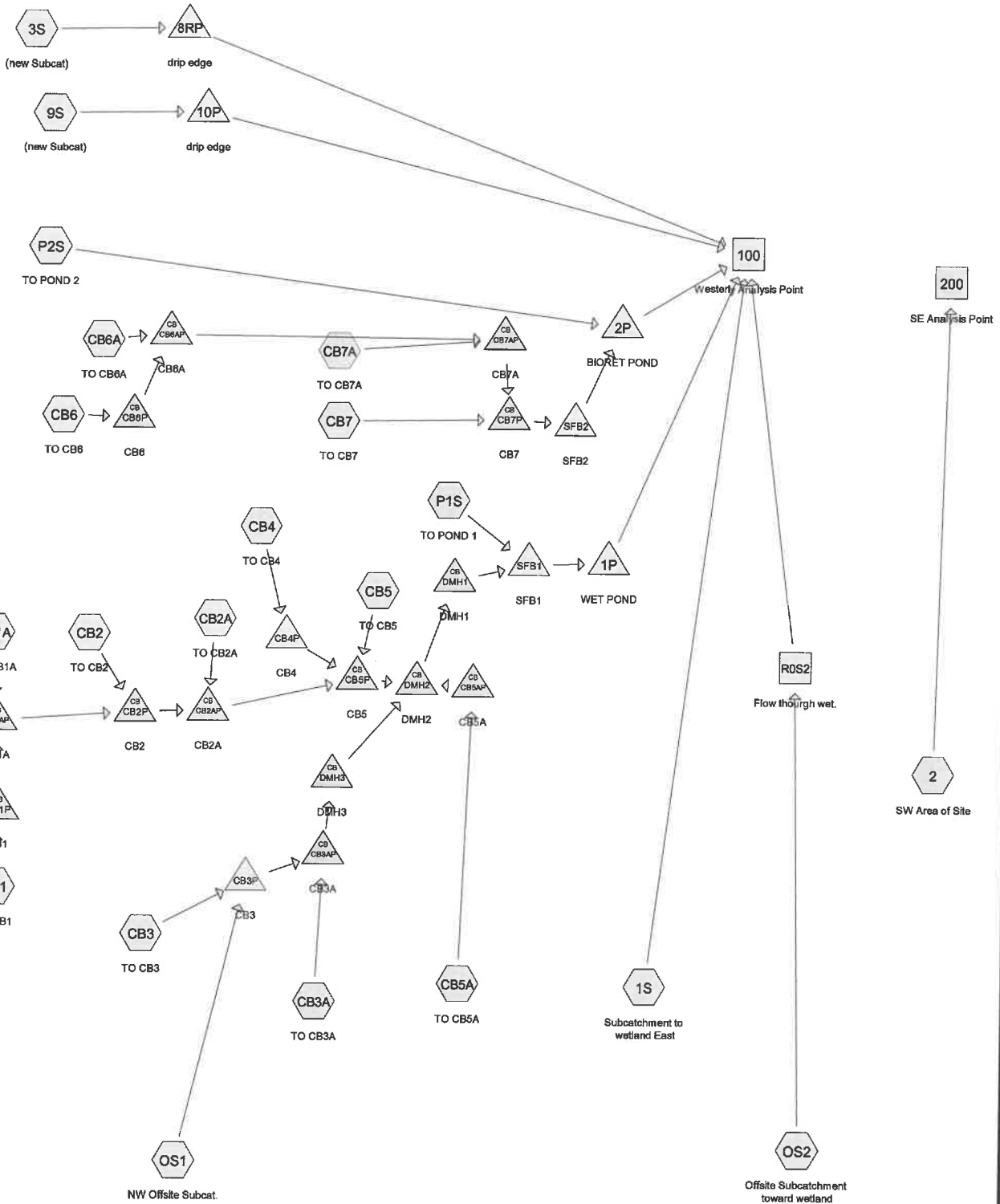
Type III 24-hr 10 YR Rainfall=4.64"

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Pond CB3P: CB3	Peak Elev=193.98' Storage=128 cf Inflow=0.46 cfs 0.067 af Outflow=0.46 cfs 0.064 af
Pond CB4P: CB4	Peak Elev=193.83' Storage=1,080 cf Inflow=0.48 cfs 0.054 af Outflow=0.08 cfs 0.031 af
Pond CB5AP: CB5A	Peak Elev=191.29' Inflow=1.04 cfs 0.115 af 15.0" Round Culvert n=0.013 L=8.0' S=0.0100 '/ Outflow=1.04 cfs 0.115 af
Pond CB5P: CB5	Peak Elev=191.38' Inflow=2.81 cfs 0.406 af 18.0" Round Culvert n=0.013 L=8.0' S=0.0100 '/ Outflow=2.81 cfs 0.406 af
Pond CB6AP: CB6A	Peak Elev=193.49' Inflow=1.55 cfs 0.117 af 15.0" Round Culvert n=0.013 L=182.0' S=0.0060 '/ Outflow=1.55 cfs 0.117 af
Pond CB6P: CB6	Peak Elev=193.62' Inflow=0.49 cfs 0.035 af 15.0" Round Culvert n=0.013 L=46.0' S=0.0061 '/ Outflow=0.49 cfs 0.035 af
Pond CB7AP: CB7A	Peak Elev=192.61' Inflow=2.24 cfs 0.166 af 15.0" Round Culvert n=0.013 L=14.0' S=0.0050 '/ Outflow=2.24 cfs 0.166 af
Pond CB7P: CB7	Peak Elev=192.40' Inflow=2.76 cfs 0.204 af 15.0" Round Culvert n=0.013 L=55.0' S=0.0049 '/ Outflow=2.76 cfs 0.204 af
Pond DMH1: DMH1	Peak Elev=190.74' Inflow=5.97 cfs 0.782 af 24.0" Round Culvert n=0.013 L=68.0' S=0.0050 '/ Outflow=5.97 cfs 0.782 af
Pond DMH2: DMH2	Peak Elev=191.26' Inflow=5.97 cfs 0.782 af 24.0" Round Culvert n=0.013 L=66.0' S=0.0050 '/ Outflow=5.97 cfs 0.782 af
Pond DMH3: DMH3	Peak Elev=191.50' Inflow=2.26 cfs 0.260 af 24.0" Round Culvert n=0.013 L=100.0' S=0.0050 '/ Outflow=2.26 cfs 0.260 af
Pond SFB1: SFB1	Peak Elev=189.82' Storage=683 cf Inflow=6.35 cfs 0.824 af Outflow=6.27 cfs 0.823 af
Pond SFB2: SFB2	Peak Elev=191.27' Storage=594 cf Inflow=2.76 cfs 0.204 af Outflow=2.75 cfs 0.194 af

Total Runoff Area = 33.484 ac Runoff Volume = 1.683 af Average Runoff Depth = 0.60"
92.87% Pervious = 31.098 ac 7.13% Impervious = 2.386 ac



Routing Diagram for NH-1263-Proposed 12-20 infiltr
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Type III 24-hr 50 YR Rainfall=7.00"

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Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Subcatchment to	Runoff Area=353,873 sf 0.00% Impervious Runoff Depth=1.94" Flow Length=868' Tc=36.2 min CN=53 Runoff=8.71 cfs 1.312 af
Subcatchment 2: SW Area of Site	Runoff Area=225,026 sf 0.00% Impervious Runoff Depth=0.32" Flow Length=653' Tc=32.0 min CN=32 Runoff=0.26 cfs 0.136 af
Subcatchment 3S: (new Subcat)	Runoff Area=3,218 sf 85.52% Impervious Runoff Depth=6.17" Tc=6.0 min CN=93 Runoff=0.49 cfs 0.038 af
Subcatchment 9S: (new Subcat)	Runoff Area=3,126 sf 85.48% Impervious Runoff Depth=6.17" Tc=6.0 min CN=93 Runoff=0.48 cfs 0.037 af
Subcatchment CB1: TO CB1	Runoff Area=18,997 sf 15.42% Impervious Runoff Depth=3.10" Flow Length=148' Tc=20.6 min CN=65 Runoff=1.04 cfs 0.113 af
Subcatchment CB1A: TO CB1A	Runoff Area=10,873 sf 23.04% Impervious Runoff Depth=3.41" Flow Length=79' Tc=17.1 min CN=68 Runoff=0.71 cfs 0.071 af
Subcatchment CB2: TO CB2	Runoff Area=42,049 sf 26.32% Impervious Runoff Depth=3.62" Flow Length=331' Tc=24.8 min CN=70 Runoff=2.51 cfs 0.291 af
Subcatchment CB2A: TO CB2A	Runoff Area=8,663 sf 77.78% Impervious Runoff Depth=5.82" Tc=6.0 min CN=90 Runoff=1.28 cfs 0.097 af
Subcatchment CB3: TO CB3	Runoff Area=30,351 sf 0.00% Impervious Runoff Depth=2.51" Flow Length=490' Tc=22.7 min CN=59 Runoff=1.26 cfs 0.146 af
Subcatchment CB3A: TO CB3A	Runoff Area=38,359 sf 55.17% Impervious Runoff Depth=4.81" Flow Length=322' Tc=20.4 min CN=81 Runoff=3.29 cfs 0.353 af
Subcatchment CB4: TO CB4	Runoff Area=25,708 sf 0.00% Impervious Runoff Depth=2.60" Flow Length=289' Tc=16.0 min CN=60 Runoff=1.28 cfs 0.128 af
Subcatchment CB5: TO CB5	Runoff Area=10,880 sf 96.03% Impervious Runoff Depth=6.64" Tc=6.0 min CN=97 Runoff=1.71 cfs 0.138 af
Subcatchment CB5A: TO CB5A	Runoff Area=14,821 sf 93.22% Impervious Runoff Depth=6.41" Flow Length=383' Tc=19.1 min CN=95 Runoff=1.60 cfs 0.182 af
Subcatchment CB6: TO CB6	Runoff Area=6,341 sf 60.48% Impervious Runoff Depth=5.03" Tc=6.0 min CN=83 Runoff=0.84 cfs 0.061 af
Subcatchment CB6A: TO CB6A	Runoff Area=10,597 sf 90.97% Impervious Runoff Depth=6.41" Tc=6.0 min CN=95 Runoff=1.65 cfs 0.130 af
Subcatchment CB7: TO CB7	Runoff Area=5,468 sf 80.78% Impervious Runoff Depth=5.94" Tc=6.0 min CN=91 Runoff=0.82 cfs 0.062 af

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Subcatchment CB7A: TO CB7A	Runoff Area=8,246 sf 68.91% Impervious Runoff Depth=5.37" Tc=6.0 min CN=86 Runoff=1.15 cfs 0.085 af
Subcatchment OS1: NW Offsite Subcat.	Runoff Area=215,064 sf 0.00% Impervious Runoff Depth=0.37" Flow Length=665' Tc=37.6 min CN=33 Runoff=0.34 cfs 0.153 af
Subcatchment OS2: Offsite Subcatchment	Runoff Area=364,021 sf 1.57% Impervious Runoff Depth=0.37" Flow Length=473' Tc=29.1 min CN=33 Runoff=0.63 cfs 0.259 af
Subcatchment P1S: TO POND 1	Runoff Area=18,353 sf 3.07% Impervious Runoff Depth=2.80" Flow Length=123' Tc=12.3 min CN=62 Runoff=1.10 cfs 0.098 af
Subcatchment P2S: TO POND 2	Runoff Area=44,538 sf 0.00% Impervious Runoff Depth=2.60" Flow Length=580' Tc=34.6 min CN=60 Runoff=1.60 cfs 0.222 af
Reach 100: Westerly Analysis Point	Inflow=19.94 cfs 3.347 af Outflow=19.94 cfs 3.347 af
Reach 200: SE Analysis Point	Inflow=0.26 cfs 0.136 af Outflow=0.26 cfs 0.136 af
Reach R0S2: Flow thorough wet.	Avg. Flow Depth=0.09' Max Vel=0.72 fps Inflow=0.63 cfs 0.259 af n=0.040 L=756.0' S=0.0159 '/ Capacity=22.49 cfs Outflow=0.54 cfs 0.259 af
Pond 1P: WET POND	Peak Elev=190.21' Storage=13,600 cf Inflow=12.91 cfs 1.741 af Outflow=12.48 cfs 1.740 af
Pond 2P: BIORET POND	Peak Elev=191.10' Storage=10,080 cf Inflow=4.90 cfs 0.549 af Discarded=0.41 cfs 0.512 af Primary=0.38 cfs 0.037 af Outflow=0.79 cfs 0.549 af
Pond 8RP: drip edge	Peak Elev=201.61' Storage=673 cf Inflow=0.49 cfs 0.038 af Discarded=0.03 cfs 0.038 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.038 af
Pond 10P: drip edge	Peak Elev=201.60' Storage=653 cf Inflow=0.48 cfs 0.037 af Discarded=0.03 cfs 0.037 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.037 af
Pond CB1AP: CB1A	Peak Elev=195.12' Inflow=1.74 cfs 0.184 af 15.0" Round Culvert n=0.013 L=148.0' S=0.0100 '/ Outflow=1.74 cfs 0.184 af
Pond CB1P: CB1	Peak Elev=195.29' Inflow=1.04 cfs 0.113 af 15.0" Round Culvert n=0.013 L=22.0' S=0.0100 '/ Outflow=1.04 cfs 0.113 af
Pond CB2AP: CB2A	Peak Elev=193.74' Inflow=4.69 cfs 0.571 af 15.0" Round Culvert n=0.013 L=162.0' S=0.0100 '/ Outflow=4.69 cfs 0.571 af
Pond CB2P: CB2	Peak Elev=194.25' Inflow=4.18 cfs 0.475 af 15.0" Round Culvert n=0.013 L=48.0' S=0.0100 '/ Outflow=4.18 cfs 0.475 af
Pond CB3AP: CB3A	Peak Elev=192.60' Inflow=4.50 cfs 0.648 af 18.0" Round Culvert n=0.013 L=33.0' S=0.0100 '/ Outflow=4.50 cfs 0.648 af

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Pond CB3P: CB3	Peak Elev=194.06' Storage=139 cf Inflow=1.27 cfs 0.298 af Outflow=1.27 cfs 0.296 af
Pond CB4P: CB4	Peak Elev=193.93' Storage=1,358 cf Inflow=1.28 cfs 0.128 af Outflow=1.00 cfs 0.105 af
Pond CB5AP: CB5A	Peak Elev=192.17' Inflow=1.60 cfs 0.182 af 15.0" Round Culvert n=0.013 L=8.0' S=0.0100 '/ Outflow=1.60 cfs 0.182 af
Pond CB5P: CB5	Peak Elev=192.63' Inflow=6.20 cfs 0.814 af 18.0" Round Culvert n=0.013 L=8.0' S=0.0100 '/ Outflow=6.20 cfs 0.814 af
Pond CB6AP: CB6A	Peak Elev=193.85' Inflow=2.49 cfs 0.191 af 15.0" Round Culvert n=0.013 L=182.0' S=0.0060 '/ Outflow=2.49 cfs 0.191 af
Pond CB6P: CB6	Peak Elev=193.93' Inflow=0.84 cfs 0.061 af 15.0" Round Culvert n=0.013 L=46.0' S=0.0061 '/ Outflow=0.84 cfs 0.061 af
Pond CB7AP: CB7A	Peak Elev=193.19' Inflow=3.64 cfs 0.275 af 15.0" Round Culvert n=0.013 L=14.0' S=0.0050 '/ Outflow=3.64 cfs 0.275 af
Pond CB7P: CB7	Peak Elev=192.81' Inflow=4.46 cfs 0.338 af 15.0" Round Culvert n=0.013 L=55.0' S=0.0049 '/ Outflow=4.46 cfs 0.338 af
Pond DMH1: DMH1	Peak Elev=191.45' Inflow=12.21 cfs 1.644 af 24.0" Round Culvert n=0.013 L=68.0' S=0.0050 '/ Outflow=12.21 cfs 1.644 af
Pond DMH2: DMH2	Peak Elev=192.10' Inflow=12.21 cfs 1.644 af 24.0" Round Culvert n=0.013 L=66.0' S=0.0050 '/ Outflow=12.21 cfs 1.644 af
Pond DMH3: DMH3	Peak Elev=192.27' Inflow=4.50 cfs 0.648 af 24.0" Round Culvert n=0.013 L=100.0' S=0.0050 '/ Outflow=4.50 cfs 0.648 af
Pond SFB1: SFB1	Peak Elev=190.21' Storage=898 cf Inflow=13.06 cfs 1.742 af Outflow=12.91 cfs 1.741 af
Pond SFB2: SFB2	Peak Elev=191.34' Storage=629 cf Inflow=4.46 cfs 0.338 af Outflow=4.45 cfs 0.327 af

Total Runoff Area = 33.484 ac Runoff Volume = 4.110 af Average Runoff Depth = 1.47"
92.87% Pervious = 31.098 ac 7.13% Impervious = 2.386 ac

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Summary for Subcatchment 1S: Subcatchment to wetland East

Runoff = 8.71 cfs @ 12.55 hrs, Volume= 1.312 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
109,109	32	Woods/grass comb., Good, HSG A
178,991	58	Woods/grass comb., Good, HSG B
7,649	70	Woods, Good, HSG C
15,714	77	Woods, Good, HSG D
28,941	61	>75% Grass cover, Good, HSG B
13,469	96	Gravel surface, HSG B
353,873	53	Weighted Average
353,873		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	50	0.0120	0.05		Sheet Flow, Sheet
					Woods: Light underbrush n= 0.400 P2= 3.00"
4.9	235	0.0260	0.81		Shallow Concentrated Flow, SC to wetland
					Woodland Kv= 5.0 fps
15.7	583	0.0154	0.62		Shallow Concentrated Flow, SC to PL
					Woodland Kv= 5.0 fps
36.2	868	Total			

Summary for Subcatchment 2: SW Area of Site

Runoff = 0.26 cfs @ 12.98 hrs, Volume= 0.136 af, Depth= 0.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
225,026	32	Woods/grass comb., Good, HSG A
225,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	50	0.0120	0.05		Sheet Flow, Sheet
					Woods: Light underbrush n= 0.400 P2= 3.00"
16.4	603	0.0150	0.61		Shallow Concentrated Flow, Sc to analysis point
					Woodland Kv= 5.0 fps
32.0	653	Total			

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Type III 24-hr 50 YR Rainfall=7.00"

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Summary for Subcatchment 3S: (new Subcat)

Runoff = 0.49 cfs @ 12.08 hrs, Volume= 0.038 af, Depth= 6.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
2,752	98	Roofs, HSG B
466	61	>75% Grass cover, Good, HSG B
3,218	93	Weighted Average
466		14.48% Pervious Area
2,752		85.52% Impervious Area

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

Summary for Subcatchment 9S: (new Subcat)

Runoff = 0.48 cfs @ 12.08 hrs, Volume= 0.037 af, Depth= 6.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
2,672	98	Roofs, HSG B
454	61	>75% Grass cover, Good, HSG B
3,126	93	Weighted Average
454		14.52% Pervious Area
2,672		85.48% Impervious Area

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

Summary for Subcatchment CB1: TO CB1

Runoff = 1.04 cfs @ 12.29 hrs, Volume= 0.113 af, Depth= 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

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Area (sf)	CN	Description
2,929	98	Paved roads w/curbs & sewers, HSG B
2,707	61	>75% Grass cover, Good, HSG B
13,361	58	Woods/grass comb., Good, HSG B
18,997	65	Weighted Average
16,068		84.58% Pervious Area
2,929		15.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	50	0.0090	0.05		Sheet Flow, SHEET Woods: Light underbrush n= 0.400 P2= 3.00"
3.1	98	0.0110	0.52		Shallow Concentrated Flow, SC TO CB Woodland Kv= 5.0 fps
20.6	148	Total			

Summary for Subcatchment CB1A: TO CB1A

Runoff = 0.71 cfs @ 12.24 hrs, Volume= 0.071 af, Depth= 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
2,505	98	Paved roads w/curbs & sewers, HSG B
3,705	61	>75% Grass cover, Good, HSG B
4,663	58	Woods/grass comb., Good, HSG B
10,873	68	Weighted Average
8,368		76.96% Pervious Area
2,505		23.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0100	0.05		Sheet Flow, SHEET Woods: Light underbrush n= 0.400 P2= 3.00"
0.3	29	0.0120	1.64		Shallow Concentrated Flow, SC TO CB Grassed Waterway Kv= 15.0 fps
17.1	79	Total			

Summary for Subcatchment CB2: TO CB2

Runoff = 2.51 cfs @ 12.35 hrs, Volume= 0.291 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

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Type III 24-hr 50 YR Rainfall=7.00"

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Area (sf)	CN	Description
11,068	98	Paved roads w/curbs & sewers, HSG B
15,348	61	>75% Grass cover, Good, HSG B
15,633	58	Woods/grass comb., Good, HSG B
42,049	70	Weighted Average
30,981		73.68% Pervious Area
11,068		26.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	50	0.0080	0.05		Sheet Flow, SHEET Woods: Light underbrush n= 0.400 P2= 3.00"
6.4	281	0.0110	0.73		Shallow Concentrated Flow, SC TO CB Short Grass Pasture Kv= 7.0 fps
24.8	331	Total			

Summary for Subcatchment CB2A: TO CB2A

Runoff = 1.28 cfs @ 12.08 hrs, Volume= 0.097 af, Depth= 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
6,738	98	Paved roads w/curbs & sewers, HSG B
1,925	61	>75% Grass cover, Good, HSG B
8,663	90	Weighted Average
1,925		22.22% Pervious Area
6,738		77.78% Impervious Area

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

Summary for Subcatchment CB3: TO CB3

Runoff = 1.26 cfs @ 12.33 hrs, Volume= 0.146 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
14,777	61	>75% Grass cover, Good, HSG B
15,574	58	Woods/grass comb., Good, HSG B
30,351	59	Weighted Average
30,351		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	50	0.0090	0.05		Sheet Flow, SHEET
2.1	62	0.0100	0.50		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC TO SWALE
3.1	378	0.0180	2.01		Woodland Kv= 5.0 fps Shallow Concentrated Flow, SC TO CB
22.7	490	Total			Grassed Waterway Kv= 15.0 fps

Summary for Subcatchment CB3A: TO CB3A

Runoff = 3.29 cfs @ 12.27 hrs, Volume= 0.353 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
21,161	98	Paved roads w/curbs & sewers, HSG B
9,831	61	>75% Grass cover, Good, HSG B
7,367	58	Woods/grass comb., Good, HSG B
38,359	81	Weighted Average
17,198		44.83% Pervious Area
21,161		55.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	50	0.0090	0.05		Sheet Flow, SHEET
1.8	75	0.0100	0.70		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC TO PAVE
1.1	197	0.0210	2.94		Short Grass Pasture Kv= 7.0 fps Shallow Concentrated Flow, SC TO CB
20.4	322	Total			Paved Kv= 20.3 fps

Summary for Subcatchment CB4: TO CB4

Runoff = 1.28 cfs @ 12.23 hrs, Volume= 0.128 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
19,617	61	>75% Grass cover, Good, HSG B
6,091	55	Woods, Good, HSG B
25,708	60	Weighted Average
25,708		100.00% Pervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	50	0.0100	0.07		Sheet Flow, SHEET
					Grass: Dense n= 0.240 P2= 3.00"
4.8	239	0.0270	0.82		Shallow Concentrated Flow, SC TO CB
					Woodland Kv= 5.0 fps
16.0	289	Total			

Summary for Subcatchment CB5: TO CB5

Runoff = 1.71 cfs @ 12.08 hrs, Volume= 0.138 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
10,448	98	Paved roads w/curbs & sewers, HSG B
432	61	>75% Grass cover, Good, HSG B
10,880	97	Weighted Average
432		3.97% Pervious Area
10,448		96.03% Impervious Area

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

Summary for Subcatchment CB5A: TO CB5A

Runoff = 1.60 cfs @ 12.25 hrs, Volume= 0.182 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
13,816	98	Paved roads w/curbs & sewers, HSG B
1,005	61	>75% Grass cover, Good, HSG B
14,821	95	Weighted Average
1,005		6.78% Pervious Area
13,816		93.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0110	0.05		Sheet Flow, SHEET
					Woods: Light underbrush n= 0.400 P2= 3.00"
1.3	55	0.0100	0.70		Shallow Concentrated Flow, SC TO PAVE
					Short Grass Pasture Kv= 7.0 fps
1.6	278	0.0200	2.87		Shallow Concentrated Flow, SC TO CB
					Paved Kv= 20.3 fps
19.1	383	Total			

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Summary for Subcatchment CB6: TO CB6

Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 5.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
3,835	98	Paved roads w/curbs & sewers, HSG B
2,506	61	>75% Grass cover, Good, HSG B
6,341	83	Weighted Average
2,506		39.52% Pervious Area
3,835		60.48% Impervious Area

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

Summary for Subcatchment CB6A: TO CB6A

Runoff = 1.65 cfs @ 12.08 hrs, Volume= 0.130 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
9,640	98	Paved roads w/curbs & sewers, HSG B
957	61	>75% Grass cover, Good, HSG B
10,597	95	Weighted Average
957		9.03% Pervious Area
9,640		90.97% Impervious Area

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

Summary for Subcatchment CB7: TO CB7

Runoff = 0.82 cfs @ 12.08 hrs, Volume= 0.062 af, Depth= 5.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
4,417	98	Paved roads w/curbs & sewers, HSG B
1,051	61	>75% Grass cover, Good, HSG B
5,468	91	Weighted Average
1,051		19.22% Pervious Area
4,417		80.78% Impervious Area

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

Summary for Subcatchment CB7A: TO CB7A

Runoff = 1.15 cfs @ 12.09 hrs, Volume= 0.085 af, Depth= 5.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
5,682	98	Paved roads w/curbs & sewers, HSG B
2,564	61	>75% Grass cover, Good, HSG B
8,246	86	Weighted Average
2,564		31.09% Pervious Area
5,682		68.91% Impervious Area

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

Summary for Subcatchment OS1: NW Offsite Subcat.

Runoff = 0.34 cfs @ 12.99 hrs, Volume= 0.153 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
38,877	39	>75% Grass cover, Good, HSG A
176,187	32	Woods/grass comb., Good, HSG A
215,064	33	Weighted Average
215,064		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.8	50	0.0100	0.05		Sheet Flow, Sheet
20.8	615	0.0097	0.49		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC to PL
37.6	665	Total			Woodland Kv= 5.0 fps

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Summary for Subcatchment OS2: Offsite Subcatchment toward wetland

Runoff = 0.63 cfs @ 12.78 hrs, Volume= 0.259 af, Depth= 0.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
335,438	32	Woods/grass comb., Good, HSG A
28,583	51	1 acre lots, 20% imp, HSG A
364,021	33	Weighted Average
358,304		98.43% Pervious Area
5,717		1.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.2	50	0.0110	0.05		Sheet Flow, Sheet
12.9	423	0.0120	0.55		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC to PL
					Woodland Kv= 5.0 fps
29.1	473	Total			

Summary for Subcatchment P1S: TO POND 1

Runoff = 1.10 cfs @ 12.18 hrs, Volume= 0.098 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
563	98	Paved parking, HSG B
17,790	61	>75% Grass cover, Good, HSG B
18,353	62	Weighted Average
17,790		96.93% Pervious Area
563		3.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	50	0.0090	0.07		Sheet Flow, SHEET
0.6	73	0.0820	2.00		Grass: Dense n= 0.240 P2= 3.00" Shallow Concentrated Flow, SC TO P1
					Short Grass Pasture Kv= 7.0 fps
12.3	123	Total			

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Summary for Subcatchment P2S: TO POND 2

Runoff = 1.60 cfs @ 12.50 hrs, Volume= 0.222 af, Depth= 2.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 50 YR Rainfall=7.00"

Area (sf)	CN	Description
22,310	61	>75% Grass cover, Good, HSG B
22,228	58	Woods/grass comb., Good, HSG B
44,538	60	Weighted Average
44,538		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.4	50	0.0080	0.05		Sheet Flow, SHEET
15.0	413	0.0084	0.46		Woods: Light underbrush n= 0.400 P2= 3.00" Shallow Concentrated Flow, SC TO LAWN
1.2	117	0.0550	1.64		Woodland Kv= 5.0 fps Shallow Concentrated Flow, SC TO P2
34.6	580	Total			Short Grass Pasture Kv= 7.0 fps

Summary for Reach 100: Westerly Analysis Point

Inflow Area = 28.318 ac, 8.43% Impervious, Inflow Depth = 1.42" for 50 YR event
Inflow = 19.94 cfs @ 12.43 hrs, Volume= 3.347 af
Outflow = 19.94 cfs @ 12.43 hrs, Volume= 3.347 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach 200: SE Analysis Point

Inflow Area = 5.166 ac, 0.00% Impervious, Inflow Depth = 0.32" for 50 YR event
Inflow = 0.26 cfs @ 12.98 hrs, Volume= 0.136 af
Outflow = 0.26 cfs @ 12.98 hrs, Volume= 0.136 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach R0S2: Flow through wet.

Inflow Area = 8.357 ac, 1.57% Impervious, Inflow Depth = 0.37" for 50 YR event
Inflow = 0.63 cfs @ 12.78 hrs, Volume= 0.259 af
Outflow = 0.54 cfs @ 13.17 hrs, Volume= 0.259 af, Atten= 14%, Lag= 23.8 min

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

Max. Velocity= 0.72 fps, Min. Travel Time= 17.6 min
Avg. Velocity = 0.34 fps, Avg. Travel Time= 37.6 min

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Peak Storage= 573 cf @ 13.17 hrs
Average Depth at Peak Storage= 0.09'
Bank-Full Depth= 0.50' Flow Area= 10.0 sf, Capacity= 22.49 cfs

30.00' x 0.50' deep Parabolic Channel, n= 0.040 Winding stream, pools & shoals
Length= 756.0' Slope= 0.0159 '/
Inlet Invert= 192.00', Outlet Invert= 180.00'



Summary for Pond 1P: WET POND

Inflow Area = 9.966 ac, 15.95% Impervious, Inflow Depth = 2.10" for 50 YR event
Inflow = 12.91 cfs @ 12.30 hrs, Volume= 1.741 af
Outflow = 12.48 cfs @ 12.36 hrs, Volume= 1.740 af, Atten= 3%, Lag= 3.6 min
Primary = 12.48 cfs @ 12.36 hrs, Volume= 1.740 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 189.23' Surf.Area= 3,526 sf Storage= 9,833 cf
Peak Elev= 190.21' @ 12.36 hrs Surf.Area= 4,197 sf Storage= 13,600 cf (3,766 cf above start)
Flood Elev= 192.00' Surf.Area= 5,426 sf Storage= 22,235 cf (12,401 cf above start)

Plug-Flow detention time= 103.8 min calculated for 1.514 af (87% of inflow)
Center-of-Mass det. time= 9.2 min (855.2 - 845.9)

Volume	Invert	Avail.Storage	Storage Description
#1	184.50'	22,235 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
184.50	886	0	0
186.00	1,528	1,811	1,811
188.00	2,679	4,207	6,018
190.00	4,056	6,735	12,753
192.00	5,426	9,482	22,235

Device	Routing	Invert	Outlet Devices
#1	Primary	189.24'	5.0' long x 23.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=12.48 cfs @ 12.36 hrs HW=190.21' TW=0.00' (Dynamic Tailwater)
↳ **1=Broad-Crested Rectangular Weir** (Weir Controls 12.48 cfs @ 2.59 fps)

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Summary for Pond 2P: BIORET POND

Inflow Area = 1.726 ac, 31.35% Impervious, Inflow Depth = 3.82" for 50 YR event
 Inflow = 4.90 cfs @ 12.09 hrs, Volume= 0.549 af
 Outflow = 0.79 cfs @ 13.33 hrs, Volume= 0.549 af, Atten= 84%, Lag= 74.1 min
 Discarded = 0.41 cfs @ 13.33 hrs, Volume= 0.512 af
 Primary = 0.38 cfs @ 13.33 hrs, Volume= 0.037 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 191.10' @ 13.33 hrs Surf.Area= 5,850 sf Storage= 10,080 cf
 Flood Elev= 191.50' Surf.Area= 6,195 sf Storage= 12,493 cf

Plug-Flow detention time= 230.2 min calculated for 0.549 af (100% of inflow)
 Center-of-Mass det. time= 230.3 min (1,058.3 - 828.0)

Volume	Invert	Avail.Storage	Storage Description
#1	187.50'	12,493 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet) Cum.Store (cubic-feet)
187.50	4,904	0.0	0 0
188.50	4,904	40.0	1,962 1,962
190.00	4,904	30.0	2,207 4,168
191.50	6,195	100.0	8,324 12,493

Device	Routing	Invert	Outlet Devices
#1	Primary	191.00'	5.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Discarded	187.50'	3.000 in/hr Exfiltration over Surface area Phase-In= 0.01'

Discarded OutFlow Max=0.41 cfs @ 13.33 hrs HW=191.10' (Free Discharge)
 ↳2=Exfiltration (Exfiltration Controls 0.41 cfs)

Primary OutFlow Max=0.38 cfs @ 13.33 hrs HW=191.10' TW=0.00' (Dynamic Tailwater)
 ↳1=Broad-Crested Rectangular Weir (Weir Controls 0.38 cfs @ 0.77 fps)

Summary for Pond 8RP: drip edge

Inflow Area = 0.074 ac, 85.52% Impervious, Inflow Depth = 6.17" for 50 YR event
 Inflow = 0.49 cfs @ 12.08 hrs, Volume= 0.038 af
 Outflow = 0.03 cfs @ 11.32 hrs, Volume= 0.038 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.32 hrs, Volume= 0.038 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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

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Peak Elev= 201.61' @ 13.51 hrs Surf.Area= 466 sf Storage= 673 cf

Plug-Flow detention time= 164.6 min calculated for 0.038 af (100% of inflow)

Center-of-Mass det. time= 164.6 min (933.4 - 768.8)

Volume	Invert	Avail.Storage	Storage Description
#1	198.00'	746 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
198.00	466	0.0	0	0
200.00	466	40.0	373	373
202.00	466	40.0	373	746

Device	Routing	Invert	Outlet Devices
#1	Discarded	198.00'	3.000 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	202.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.10 0.25 Width (feet) 2.00 2.00

Discarded OutFlow Max=0.03 cfs @ 11.32 hrs HW=198.04' (Free Discharge)

↳1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=198.00' TW=0.00' (Dynamic Tailwater)

↳2=Custom Weir/Orifice (Controls 0.00 cfs)

Summary for Pond 10P: drip edge

Inflow Area = 0.072 ac, 85.48% Impervious, Inflow Depth = 6.17" for 50 YR event
 Inflow = 0.48 cfs @ 12.08 hrs, Volume= 0.037 af
 Outflow = 0.03 cfs @ 11.32 hrs, Volume= 0.037 af, Atten= 93%, Lag= 0.0 min
 Discarded = 0.03 cfs @ 11.32 hrs, Volume= 0.037 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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

Peak Elev= 201.60' @ 13.50 hrs Surf.Area= 454 sf Storage= 653 cf

Plug-Flow detention time= 163.7 min calculated for 0.037 af (100% of inflow)

Center-of-Mass det. time= 163.7 min (932.5 - 768.8)

Volume	Invert	Avail.Storage	Storage Description
#1	198.00'	726 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
198.00	454	0.0	0	0
200.00	454	40.0	363	363
202.00	454	40.0	363	726

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Device	Routing	Invert	Outlet Devices
#1	Discarded	198.00'	3.000 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	202.00'	Custom Weir/Orifice, Cv= 2.62 (C= 3.28) Head (feet) 0.10 0.25 Width (feet) 2.00 2.00

Discarded OutFlow Max=0.03 cfs @ 11.32 hrs HW=198.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=198.00' TW=0.00' (Dynamic Tailwater)

↑2=Custom Weir/Orifice (Controls 0.00 cfs)

Summary for Pond CB1AP: CB1A

Inflow Area = 0.686 ac, 18.19% Impervious, Inflow Depth = 3.21" for 50 YR event
 Inflow = 1.74 cfs @ 12.27 hrs, Volume= 0.184 af
 Outflow = 1.74 cfs @ 12.27 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.74 cfs @ 12.27 hrs, Volume= 0.184 af

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

Peak Elev= 195.12' @ 12.30 hrs

Flood Elev= 198.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	194.39'	15.0" Round Culvert L= 148.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.39' / 192.91' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.71 cfs @ 12.27 hrs HW=195.11' TW=194.17' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.71 cfs @ 3.35 fps)

Summary for Pond CB1P: CB1

Inflow Area = 0.436 ac, 15.42% Impervious, Inflow Depth = 3.10" for 50 YR event
 Inflow = 1.04 cfs @ 12.29 hrs, Volume= 0.113 af
 Outflow = 1.04 cfs @ 12.29 hrs, Volume= 0.113 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.04 cfs @ 12.29 hrs, Volume= 0.113 af

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

Peak Elev= 195.29' @ 12.30 hrs

Flood Elev= 198.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	194.61'	15.0" Round Culvert L= 22.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 194.61' / 194.39' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

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Primary OutFlow Max=1.04 cfs @ 12.29 hrs HW=195.29' TW=195.12' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 1.04 cfs @ 2.22 fps)

Summary for Pond CB2AP: CB2A

Inflow Area = 1.850 ac, 28.84% Impervious, Inflow Depth = 3.71" for 50 YR event
 Inflow = 4.69 cfs @ 12.29 hrs, Volume= 0.571 af
 Outflow = 4.69 cfs @ 12.29 hrs, Volume= 0.571 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.69 cfs @ 12.29 hrs, Volume= 0.571 af

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

Peak Elev= 193.74' @ 12.32 hrs

Flood Elev= 196.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	192.23'	15.0" Round Culvert L= 162.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 192.23' / 190.61' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.64 cfs @ 12.29 hrs HW=193.73' TW=192.61' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 4.64 cfs @ 4.00 fps)

Summary for Pond CB2P: CB2

Inflow Area = 1.651 ac, 22.95% Impervious, Inflow Depth = 3.45" for 50 YR event
 Inflow = 4.18 cfs @ 12.32 hrs, Volume= 0.475 af
 Outflow = 4.18 cfs @ 12.32 hrs, Volume= 0.475 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.18 cfs @ 12.32 hrs, Volume= 0.475 af

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

Peak Elev= 194.25' @ 12.32 hrs

Flood Elev= 197.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	192.81'	15.0" Round Culvert L= 48.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 192.81' / 192.33' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.16 cfs @ 12.32 hrs HW=194.25' TW=193.74' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 4.16 cfs @ 3.70 fps)

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Summary for Pond CB3AP: CB3A

Inflow Area = 6.515 ac, 7.46% Impervious, Inflow Depth = 1.19" for 50 YR event
 Inflow = 4.50 cfs @ 12.29 hrs, Volume= 0.648 af
 Outflow = 4.50 cfs @ 12.29 hrs, Volume= 0.648 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.50 cfs @ 12.29 hrs, Volume= 0.648 af

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

Peak Elev= 192.60' @ 12.31 hrs

Flood Elev= 195.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	191.17'	18.0" Round Culvert L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 191.17' / 190.84' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.43 cfs @ 12.29 hrs HW=192.59' TW=192.26' (Dynamic Tailwater)

←1=Culvert (Outlet Controls 4.43 cfs @ 3.30 fps)

Summary for Pond CB3P: CB3

Inflow Area = 5.634 ac, 0.00% Impervious, Inflow Depth = 0.64" for 50 YR event
 Inflow = 1.27 cfs @ 12.34 hrs, Volume= 0.298 af
 Outflow = 1.27 cfs @ 12.34 hrs, Volume= 0.296 af, Atten= 0%, Lag= 0.2 min
 Primary = 1.27 cfs @ 12.34 hrs, Volume= 0.296 af

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

Peak Elev= 194.06' @ 12.34 hrs Surf.Area= 152 sf Storage= 139 cf

Flood Elev= 195.00' Surf.Area= 547 sf Storage= 469 cf

Plug-Flow detention time= 7.6 min calculated for 0.296 af (99% of inflow)

Center-of-Mass det. time= 2.8 min (948.1 - 945.3)

Volume	Invert	Avail.Storage	Storage Description
#1	188.40'	1,225 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
188.40	13	0	0
193.00	13	60	60
194.00	129	71	131
196.00	965	1,094	1,225

Device	Routing	Invert	Outlet Devices
#1	Primary	191.40'	15.0" Round Culvert L= 23.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 191.40' / 191.17' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	193.90'	19.0" x 19.0" Horiz. Orifice/Grate C= 0.600

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Limited to weir flow at low heads

Primary OutFlow Max=1.27 cfs @ 12.34 hrs HW=194.06' TW=192.59' (Dynamic Tailwater)

- ↑1=Culvert (Passes 1.27 cfs of 7.17 cfs potential flow)
- ↑2=Orifice/Grate (Weir Controls 1.27 cfs @ 1.29 fps)

Summary for Pond CB4P: CB4

Inflow Area = 0.590 ac, 0.00% Impervious, Inflow Depth = 2.60" for 50 YR event
 Inflow = 1.28 cfs @ 12.23 hrs, Volume= 0.128 af
 Outflow = 1.00 cfs @ 12.38 hrs, Volume= 0.105 af, Atten= 22%, Lag= 9.2 min
 Primary = 1.00 cfs @ 12.38 hrs, Volume= 0.105 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 193.93' @ 12.38 hrs Surf.Area= 2,751 sf Storage= 1,358 cf

Plug-Flow detention time= 119.2 min calculated for 0.105 af (82% of inflow)
 Center-of-Mass det. time= 42.9 min (905.7 - 862.8)

Volume	Invert	Avail.Storage	Storage Description
#1	187.67'	5,890 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
187.67	13	0	0
193.00	13	69	69
194.00	2,950	1,482	1,551
195.00	5,728	4,339	5,890

Device	Routing	Invert	Outlet Devices
#1	Primary	190.42'	18.0" Round Culvert L= 65.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 190.42' / 190.10' S= 0.0049 ' S= 0.0049 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#2	Device 1	193.80'	19.0" x 19.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.00 cfs @ 12.38 hrs HW=193.93' TW=192.50' (Dynamic Tailwater)

- ↑1=Culvert (Passes 1.00 cfs of 10.18 cfs potential flow)
- ↑2=Orifice/Grate (Weir Controls 1.00 cfs @ 1.19 fps)

Summary for Pond CB5AP: CB5A

Inflow Area = 0.340 ac, 93.22% Impervious, Inflow Depth = 6.41" for 50 YR event
 Inflow = 1.60 cfs @ 12.25 hrs, Volume= 0.182 af
 Outflow = 1.60 cfs @ 12.25 hrs, Volume= 0.182 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.60 cfs @ 12.25 hrs, Volume= 0.182 af

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

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Peak Elev= 192.17' @ 12.31 hrs

Flood Elev= 194.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	190.00'	15.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 190.00' / 189.92' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.26 cfs @ 12.25 hrs HW=192.07' TW=192.02' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 1.26 cfs @ 1.02 fps)**Summary for Pond CB5P: CB5**

Inflow Area = 2.690 ac, 28.75% Impervious, Inflow Depth = 3.63" for 50 YR event
 Inflow = 6.20 cfs @ 12.32 hrs, Volume= 0.814 af
 Outflow = 6.20 cfs @ 12.32 hrs, Volume= 0.814 af, Atten= 0%, Lag= 0.0 min
 Primary = 6.20 cfs @ 12.32 hrs, Volume= 0.814 af

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

Peak Elev= 192.63' @ 12.32 hrs

Flood Elev= 194.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	190.10'	18.0" Round Culvert L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 190.10' / 190.02' S= 0.0100 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.22 cfs @ 12.32 hrs HW=192.63' TW=192.10' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 6.22 cfs @ 3.52 fps)**Summary for Pond CB6AP: CB6A**

Inflow Area = 0.389 ac, 79.55% Impervious, Inflow Depth = 5.89" for 50 YR event
 Inflow = 2.49 cfs @ 12.08 hrs, Volume= 0.191 af
 Outflow = 2.49 cfs @ 12.08 hrs, Volume= 0.191 af, Atten= 0%, Lag= 0.0 min
 Primary = 2.49 cfs @ 12.08 hrs, Volume= 0.191 af

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

Peak Elev= 193.85' @ 12.09 hrs

Flood Elev= 197.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	192.76'	15.0" Round Culvert L= 182.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 192.76' / 191.67' S= 0.0060 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

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Primary OutFlow Max=2.42 cfs @ 12.08 hrs HW=193.83' TW=193.18' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 2.42 cfs @ 2.89 fps)

Summary for Pond CB6P: CB6

Inflow Area = 0.146 ac, 60.48% Impervious, Inflow Depth = 5.03" for 50 YR event
 Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af
 Outflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af

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

Peak Elev= 193.93' @ 12.10 hrs

Flood Elev= 197.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	193.13'	15.0" Round Culvert L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 193.13' / 192.85' S= 0.0061 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.73 cfs @ 12.09 hrs HW=193.91' TW=193.84' (Dynamic Tailwater)

↑1=Culvert (Outlet Controls 0.73 cfs @ 1.30 fps)

Summary for Pond CB7AP: CB7A

Inflow Area = 0.578 ac, 76.07% Impervious, Inflow Depth = 5.72" for 50 YR event
 Inflow = 3.64 cfs @ 12.08 hrs, Volume= 0.275 af
 Outflow = 3.64 cfs @ 12.08 hrs, Volume= 0.275 af, Atten= 0%, Lag= 0.0 min
 Primary = 3.64 cfs @ 12.08 hrs, Volume= 0.275 af

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

Peak Elev= 193.19' @ 12.09 hrs

Flood Elev= 195.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	191.57'	15.0" Round Culvert L= 14.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 191.57' / 191.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.59 cfs @ 12.08 hrs HW=193.18' TW=192.81' (Dynamic Tailwater)

↑1=Culvert (Inlet Controls 3.59 cfs @ 2.92 fps)

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Summary for Pond CB7P: CB7

Inflow Area = 0.704 ac, 76.91% Impervious, Inflow Depth = 5.76" for 50 YR event
 Inflow = 4.46 cfs @ 12.08 hrs, Volume= 0.338 af
 Outflow = 4.46 cfs @ 12.08 hrs, Volume= 0.338 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.46 cfs @ 12.08 hrs, Volume= 0.338 af

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

Peak Elev= 192.81' @ 12.08 hrs

Flood Elev= 195.37'

Device	Routing	Invert	Outlet Devices
#1	Primary	191.40'	15.0" Round Culvert L= 55.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 191.40' / 191.13' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=4.45 cfs @ 12.08 hrs HW=192.81' TW=191.34' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 4.45 cfs @ 4.01 fps)**Summary for Pond DMH1: DMH1**

Inflow Area = 9.545 ac, 16.52% Impervious, Inflow Depth = 2.07" for 50 YR event
 Inflow = 12.21 cfs @ 12.30 hrs, Volume= 1.644 af
 Outflow = 12.21 cfs @ 12.30 hrs, Volume= 1.644 af, Atten= 0%, Lag= 0.0 min
 Primary = 12.21 cfs @ 12.30 hrs, Volume= 1.644 af

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

Peak Elev= 191.45' @ 12.30 hrs

Flood Elev= 195.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	189.50'	24.0" Round Culvert L= 68.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 189.50' / 189.16' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=12.21 cfs @ 12.30 hrs HW=191.45' TW=190.18' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 12.21 cfs @ 4.96 fps)**Summary for Pond DMH2: DMH2**

Inflow Area = 9.545 ac, 16.52% Impervious, Inflow Depth = 2.07" for 50 YR event
 Inflow = 12.21 cfs @ 12.30 hrs, Volume= 1.644 af
 Outflow = 12.21 cfs @ 12.30 hrs, Volume= 1.644 af, Atten= 0%, Lag= 0.0 min
 Primary = 12.21 cfs @ 12.30 hrs, Volume= 1.644 af

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

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Peak Elev= 192.10' @ 12.31 hrs
Flood Elev= 194.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	189.92'	24.0" Round Culvert L= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 189.92' / 189.59' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=12.20 cfs @ 12.30 hrs HW=192.10' TW=191.45' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 12.20 cfs @ 4.43 fps)

Summary for Pond DMH3: DMH3

Inflow Area = 6.515 ac, 7.46% Impervious, Inflow Depth = 1.19" for 50 YR event
 Inflow = 4.50 cfs @ 12.29 hrs, Volume= 0.648 af
 Outflow = 4.50 cfs @ 12.29 hrs, Volume= 0.648 af, Atten= 0%, Lag= 0.0 min
 Primary = 4.50 cfs @ 12.29 hrs, Volume= 0.648 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 192.27' @ 12.31 hrs
Flood Elev= 195.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	190.52'	24.0" Round Culvert L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 190.52' / 190.02' S= 0.0050 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=4.38 cfs @ 12.29 hrs HW=192.26' TW=192.10' (Dynamic Tailwater)
↑1=Culvert (Outlet Controls 4.38 cfs @ 2.02 fps)

Summary for Pond SFB1: SFB1

Inflow Area = 9.966 ac, 15.95% Impervious, Inflow Depth = 2.10" for 50 YR event
 Inflow = 13.06 cfs @ 12.29 hrs, Volume= 1.742 af
 Outflow = 12.91 cfs @ 12.30 hrs, Volume= 1.741 af, Atten= 1%, Lag= 0.3 min
 Primary = 12.91 cfs @ 12.30 hrs, Volume= 1.741 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Starting Elev= 189.00' Surf.Area= 347 sf Storage= 328 cf
Peak Elev= 190.21' @ 12.37 hrs Surf.Area= 605 sf Storage= 898 cf (570 cf above start)
Flood Elev= 192.00' Surf.Area= 1,069 sf Storage= 2,397 cf (2,069 cf above start)

Plug-Flow detention time= 7.9 min calculated for 1.733 af (99% of inflow)
Center-of-Mass det. time= 2.1 min (845.9 - 843.9)

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Volume	Invert	Avail.Storage	Storage Description
#1	187.00'	2,397 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
187.00	25	0	0
188.00	142	84	84
190.00	551	693	777
192.00	1,069	1,620	2,397

Device	Routing	Invert	Outlet Devices
#1	Primary	189.00'	25.0' long x 8.0' 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) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74

Primary OutFlow Max=0.00 cfs @ 12.30 hrs HW=190.18' TW=190.18' (Dynamic Tailwater)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Summary for Pond SFB2: SFB2

Inflow Area = 0.704 ac, 76.91% Impervious, Inflow Depth = 5.76" for 50 YR event
 Inflow = 4.46 cfs @ 12.08 hrs, Volume= 0.338 af
 Outflow = 4.45 cfs @ 12.09 hrs, Volume= 0.327 af, Atten= 0%, Lag= 0.3 min
 Primary = 4.45 cfs @ 12.09 hrs, Volume= 0.327 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Starting Elev= 189.00' Surf.Area= 81 sf Storage= 50 cf
 Peak Elev= 191.34' @ 12.09 hrs Surf.Area= 558 sf Storage= 629 cf (579 cf above start)
 Flood Elev= 191.50' Surf.Area= 608 sf Storage= 724 cf (674 cf above start)

Plug-Flow detention time= 36.0 min calculated for 0.326 af (97% of inflow)
 Center-of-Mass det. time= 14.4 min (792.8 - 778.4)

Volume	Invert	Avail.Storage	Storage Description
#1	188.00'	724 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
188.00	19	0	0
190.00	142	161	161
191.50	608	563	724

Device	Routing	Invert	Outlet Devices
#1	Primary	191.10'	16.0' long x 6.0' 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) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83

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Primary OutFlow Max=4.45 cfs @ 12.09 hrs HW=191.34' TW=189.22' (Dynamic Tailwater)
↑1=**Broad-Crested Rectangular Weir** (Weir Controls 4.45 cfs @ 1.17 fps)

APPENDIX III

Charts, Graphs, and Calculations

Test Pit Logs for RTE 9 and 125 in Barrington
5/21/2020. JP Gove

#1

0-10". 10YR3/3. Loamy fine sand. Friable. Granular
10-29". 10YR5/6. Loamy sand. Friable. Granular
29-68". 2.5Y5/3. Loamy sand. Friable. Massive with 30% redox. Loamy very fine sand layer.
Water table at 29".

#2

0-12". 10YR3/3. Loamy fine sand. Friable. Granular
12-31". 10YR5/6. Loamy sand. Friable. Granular
31-70". 2.5Y5/3. Loamy sand. Friable. Massive with 30% redox. Observed water at 60"
Water table at 31".

#3

0-7". 10YR3/3. Loamy fine sand. Friable. Granular
7-32". 10YR5/6. Loamy sand. Friable. Granular
32-68". 2.5Y5/4. Loamy sand. Friable. Massive with 30% redox. Observed water at 55".
Water table at 32".

#4

0-7". 10YR3/3. Fine sandy loam. Friable. Granular
7-30". 10YR4/6. Loamy sand. Friable. Granular
30-67". 2.5Y5/2. Silty clay loam. Firm. Platy. 30% redox. Observed water at 33".
Water table at 30".

#5

0-9". 10YR3/3. Loamy fine sand. Friable. Granular
9-30". 10YR5/6. Loamy sand. Friable. Granular
30-69". 2.5Y5/3. Loamy sand. Friable. Massive. 30% redox. Observed water at 68".
Water table at 30".

#6

0-7". 10YR3/3. Loamy fine sand. Friable. Granular
7-34". 10YR5/6. Loamy sand. Friable. Granular
34-75". 2.5Y5/3. Sand. Friable. Massive. 30% redox.
Water table at 34".

#7".

0-11". 10YR3/3. Loamy fine sand. Friable. Granular
11-33". 10YR5/6. Loamy sand. Friable. Granular
33-73". 2.5Y5/3. Sand. Friable. Massive. 30% redox.
Water table at 33".

#8

0-7". 10YR3/3. Fine sandy loam. Friable. Granular. Old fill
7-39". 10YR4/6. Loamy sand. Friable. Granular. Relic mottles at 7".
39-68". 2.5Y5/3. Sand. Friable. Massive. 30% redox
Water table at 39".

A

0-11". 10YR3/3. Loamy fine sand. Friable Granular
11-38". 10YR5/6. Loamy sand. Friable. Granular
38-69. 2.5Y5/3. Sand. Friable. Massive. 30% redox
Water table at 38".

B

0- 13". 10YR3/3. Loamy fine sand. Friable. Granular
13-38". 10YR5/6. Loamy sand. Friable. Granular
38-68". 2.5Y5/3. Sand. Friable. Massive. 30% redox
Water table at 38".



SITE-SPECIFIC SOIL SURVEY REPORT
ROUTES 9 AND 125
BARRINGTON, NH
GES # 2020036

1. MAPPING STANDARDS

Site-Specific Soil Mapping Standards for New Hampshire and Vermont. SSSNNE Special Publication No. 3, Version 5.0, December 2017. 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.

2. DATE SOIL MAP PRODUCED

21 May 2020

3. GEOGRAPHIC LOCATION AND SIZE OF SITE

Approximately 29 was soil mapped. Tax map 238 , Lot 36 . The site is located in the Town of Barrington, NH.

4. PURPOSE OF THE SOIL MAP

The preparation of this map was requested by Beals Associates. The purpose was to meet the requirements of NH Alteration of Terrain.

5. SOIL IDENTIFICATION LEGEND

SSSM SYM.	SSS MAP NAME	HISS SYM.	HYDROLOGIC SOIL GRP.
26	Windsor loamy sand	111	A
34	Wareham fine sandy loam	511	C
115	Scarboro muck	611	D
313	Deerfield loamy sand	311	B

SLOPE PHASE:

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

6. SOIL MAP UNIT DESCRIPTIONS

26 WINDSOR LOAMY SAND is an outwash soil that has developed on sand plains. The soil is excessively drained and is sandy throughout. Inclusions would be Deerfield loamy sand. Water tables are below 40 inches. In this case, relic mottles were observed in the soil profile at less than 40 inches.

34 WAREHAM FINE SANDY LOAM is found in outwash sand plains and has developed as a poorly drained hydric soil. Estimated seasonal high water table is within 12 inches of the soil surface. Inclusions would be soils that have silty clay loam texture within the substratum.

115 SCARBORO MUCK is found in outwash sand plains and has developed on areas so wet that a much layer has formed at the soil surface. The estimated seasonal high water table is at the surface, and sometimes above the surface as ponded areas. Inclusions would be soils that have silty clay loam textures within the substratum.

311 DEERFIELD LOAMY SAND is found in outwash sand plains and is moderately well drained. The majority of the observed test pits had estimated seasonal high water tables at 30 to 39 inches below the soil surface. Inclusions were soils that had silty clay loam textures within the substratum. Only one pit had the silty clay loam within 40 inches of the soil surface. Typically the silty clay loam textures were deeper than 75 inches from the soil surface. Some pits had relic mottles higher than the estimated seasonal high water tables.

7. RESPONSIBLE SOIL SCIENTIST

James P. Gove, C.S.S. #004

8. OTHER DISTINGUISHING FEATURES OF SITE

Area was cut heavily and has many new shrubs and saplings.

9. MAXIMUM SIZE OF LIMITING INCLUSIONS

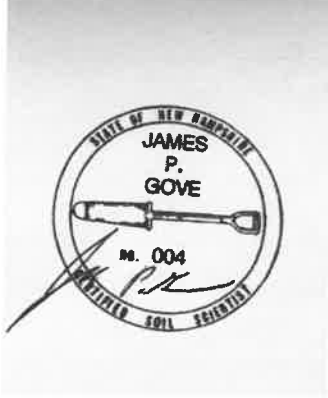
15%



10. SPECIAL FEATURE SYMBOLS

None used.

20 May 2020



Extreme Precipitation Tables

Northeast Regional Climate Center

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

Smoothing	Yes
State	New Hampshire
Location	
Longitude	70.984 degrees West
Latitude	43.230 degrees North
Elevation	0 feet
Date/Time	Thu, 02 May 2019 17:28:22 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.26	0.40	0.49	0.65	0.81	1.02	1yr	0.70	0.98	1.19	1.53	1.97	2.56	2.82	1yr	2.26	2.71	3.12	3.85	4.41	1yr
2yr	0.32	0.49	0.61	0.80	1.01	1.28	2yr	0.87	1.16	1.49	1.89	2.41	3.08	3.44	2yr	2.73	3.30	3.80	4.53	5.16	2yr
5yr	0.37	0.57	0.72	0.96	1.23	1.57	5yr	1.06	1.44	1.84	2.36	3.03	3.89	4.39	5yr	3.44	4.22	4.84	5.71	6.45	5yr
10yr	0.40	0.63	0.80	1.09	1.42	1.84	10yr	1.22	1.69	2.17	2.80	3.60	4.64	5.29	10yr	4.11	5.09	5.82	6.80	7.65	10yr
25yr	0.46	0.74	0.94	1.30	1.73	2.27	25yr	1.49	2.08	2.69	3.50	4.53	5.86	6.77	25yr	5.19	6.51	7.43	8.57	9.57	25yr
50yr	0.52	0.83	1.07	1.49	2.01	2.67	50yr	1.73	2.45	3.17	4.15	5.40	7.00	8.17	50yr	6.19	7.85	8.94	10.22	11.35	50yr
100yr	0.58	0.94	1.21	1.72	2.33	3.13	100yr	2.01	2.88	3.74	4.92	6.42	8.36	9.85	100yr	7.40	9.48	10.75	12.20	13.47	100yr
200yr	0.65	1.06	1.37	1.97	2.72	3.68	200yr	2.35	3.39	4.43	5.85	7.66	9.99	11.89	200yr	8.84	11.43	12.94	14.56	15.99	200yr
500yr	0.76	1.25	1.64	2.38	3.33	4.56	500yr	2.87	4.21	5.50	7.32	9.65	12.64	15.25	500yr	11.19	14.67	16.55	18.40	20.08	500yr

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.36	0.44	0.60	0.73	0.90	1yr	0.63	0.88	0.91	1.25	1.51	1.95	2.48	1yr	1.73	2.39	2.93	3.28	3.97	1yr
2yr	0.31	0.48	0.59	0.81	0.99	1.18	2yr	0.86	1.15	1.35	1.81	2.34	2.99	3.34	2yr	2.65	3.21	3.69	4.41	5.03	2yr
5yr	0.35	0.54	0.67	0.91	1.16	1.40	5yr	1.00	1.37	1.61	2.14	2.77	3.61	4.06	5yr	3.20	3.90	4.52	5.34	6.04	5yr
10yr	0.38	0.59	0.73	1.02	1.32	1.60	10yr	1.14	1.56	1.81	2.43	3.12	4.14	4.70	10yr	3.66	4.52	5.25	6.17	6.92	10yr
25yr	0.44	0.67	0.83	1.19	1.56	1.91	25yr	1.35	1.87	2.12	2.83	3.62	4.95	5.70	25yr	4.38	5.48	6.41	7.44	8.22	25yr
50yr	0.49	0.74	0.92	1.33	1.78	2.19	50yr	1.54	2.14	2.37	3.20	4.05	5.66	6.58	50yr	5.01	6.33	7.46	8.58	9.47	50yr
100yr	0.54	0.82	1.03	1.49	2.04	2.52	100yr	1.76	2.46	2.67	3.59	4.51	6.45	7.59	100yr	5.71	7.30	8.69	9.89	10.81	100yr
200yr	0.61	0.91	1.16	1.68	2.34	2.89	200yr	2.02	2.82	3.00	4.04	5.03	7.36	8.77	200yr	6.51	8.43	10.13	11.40	12.36	200yr
500yr	0.71	1.06	1.36	1.98	2.82	3.49	500yr	2.43	3.42	3.51	4.72	5.82	8.71	10.60	500yr	7.71	10.20	12.41	13.77	14.70	500yr

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.71	0.87	1.07	1yr	0.75	1.05	1.23	1.72	2.18	2.76	3.01	1yr	2.44	2.90	3.34	4.14	4.73	1yr
2yr	0.33	0.50	0.62	0.84	1.03	1.24	2yr	0.89	1.21	1.46	1.94	2.50	3.19	3.55	2yr	2.82	3.41	3.92	4.67	5.32	2yr
5yr	0.39	0.60	0.75	1.02	1.30	1.57	5yr	1.12	1.53	1.83	2.47	3.16	4.17	4.71	5yr	3.69	4.53	5.18	6.07	6.83	5yr
10yr	0.45	0.70	0.87	1.21	1.56	1.90	10yr	1.35	1.86	2.21	3.01	3.80	5.14	5.85	10yr	4.55	5.63	6.42	7.41	8.29	10yr
25yr	0.55	0.84	1.05	1.49	1.97	2.44	25yr	1.70	2.38	2.84	3.91	4.88	6.80	7.81	25yr	6.02	7.51	8.50	9.79	10.75	25yr
50yr	0.64	0.97	1.21	1.74	2.34	2.93	50yr	2.02	2.87	3.44	4.75	5.92	8.40	9.73	50yr	7.44	9.36	10.54	12.01	13.18	50yr
100yr	0.74	1.13	1.41	2.04	2.79	3.53	100yr	2.41	3.45	4.17	5.81	7.19	10.39	12.13	100yr	9.20	11.66	13.04	14.76	16.09	100yr
200yr	0.87	1.30	1.65	2.39	3.33	4.27	200yr	2.87	4.17	5.06	7.09	8.71	12.89	15.14	200yr	11.41	14.56	16.15	18.13	19.67	200yr
500yr	1.06	1.57	2.02	2.94	4.18	5.46	500yr	3.61	5.33	6.53	9.25	11.26	17.18	20.29	500yr	15.20	19.51	21.43	23.83	25.67	500yr

Soil Series	Legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Sunday	102	6.0	20.0	6.00	20.0	A	1	Flood Plain (Bottom Land)	frigid	sandy	no	occasionally flooded
Winooski	103	0.6	6.0	0.60	6.0	B	3	Flood Plain (Bottom Land)	mesic	silty	no	very fine sandy loam
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy, to coarse sand in C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Hadley	108	0.6	2.0	0.60	6.0	B	2	Flood Plain (Bottom Land)	mesic	silty	no	strata of fine sand, occ flooded
Limerick	109	0.6	2.0	0.60	2.0	C	5	Flood Plain (Bottom Land)	mesic	silty	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Finch	116							Outwash and Stream Terraces	frigid	sandy	yes	cemented (orstein)
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand
Telos	123	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channevy silt loam in Cd
Chesuncook	126	0.6	2.0	0.02	0.2	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channevy silt loam in Cd
Allagash	127	0.6	2.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	loamy	yes	loamy over sandy
Elliottsville	128	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	20 to 40 in. deep
Hitchcock	130	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam to silt in C
Burnham	131	0.2	6.0	0.02	0.2	D	6	Terraces and glacial lake plains	frigid	loamy	no	organic over silt
Monson	132	0.6	2.0	0.06	0.6	B	3	Terraces and glacial lake plains	mesic	silty	no	thin strata silty clay loam
Maybid	133	0.6	2.0	0.60	2.0	D	4	Friable till, silty, schist & phyllite	frigid	loamy	yes	less than 20 in. deep
Shadleigh	134	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	mesic	fine	no	silt over clay
Monadnock	136	0.6	2.0	2.00	6.0	C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Acton	146	2.0	20.0	2.00	20.0	B	3	Loose till, sandy textures	frigid	loamy over sandy, sandy-skeletal	yes	gravelly loamy sand in C
Vassalboro	150							Loose till, sandy textures	mesic	sandy-skeletal	no	cobbly loamy sand
Success	154	2.0	6.0	6.00	20.0	A	1	Organic Materials - Freshwater	frigid	peat	no	deep organic
Canterbury	166	0.6	2.0	0.06	0.6	C	3	Sandy Till	frigid	loamy	yes	cemented
Sunapee	168	0.6	2.0	0.60	6.0	B	3	Firm, platy, loamy till	frigid	sandy-skeletal	no	loam in Cd
Waskish	195							Loose till, loamy textures	frigid	loamy	yes	
Ondawa	201	0.6	6.0	6.00	20.0	D	6	Organic Materials - Freshwater	frigid	peat	no	deep organic
Sunday	202	6.0	20.0	6.00	20.0	A	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Fryeburg	208	0.6	2.0	2.00	6.0	B	2	Flood Plain (Bottom Land)	frigid	sandy	no	frequently flooded
Charles	209	0.6	100.0	0.60	100.0	C	5	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Warwick	210	2.0	6.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	loamy-skeletal	no	
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	loamy over slate gravel
Boscawen	220	6.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	frigid	sandy-skeletal	no	
Bemis	224	0.6	0.2	0.00	0.2	C	5	Firm, platy, loamy till	frigid	loamy	no	loamy cap
Bice	226	0.6	6.0	0.60	6.0	B	2	Loose till, loamy textures	frigid	loamy	no	
Lanesboro	228	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy textures	frigid	loamy	no	sandy loam
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	loamy	no	channevy silt loam in Cd
Buxton	232	0.1	0.6	0.00	0.2	C	3	Silt and Clay Deposits	frigid	silty	no	silt loam in C
Scamtic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	silty clay
Biddford	234	0.0	0.2	0.00	0.2	D	6	Silt and Clay Deposits	frigid	fine	no	
Buckland	237	0.6	2.0	0.06	0.2	C	3	Firm, platy, loamy till	frigid	loamy	no	organic over clay
Elmridge	238	2.0	6.0	0.00	0.2	C	3	Sandy/loamy over silt/clay	mesic	loamy over clayey	no	loam in Cd
Brayton	240	0.6	2.0	0.06	0.6	C	5	Firm, platy, silty till, schist & phyllite	frigid	loamy	no	
Lyme	246	0.6	6.0	0.60	6.0	C	5	Loose till, sandy textures	frigid	loamy	no	
Millsite	251	0.6	2.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	no	
Macomber	252	0.6	2.0	0.60	2.0	C	4	Friable till, silty, schist & phyllite	frigid	loamy-skeletal	no	20 to 40 in. deep
Lombard	259	0.6	6.0	2.00	20.0	C/D	2	Weathered bedrock, phyllite	frigid	loamy	yes	20 to 40 in. deep
Sunapee var	269	0.6	2.0	0.60	6.0	B	3	Loose till, loamy textures	frigid	loamy	yes	very channevy
Chaffield Var.	289	0.6	6.0	0.60	6.0	B	3	Loose till, bedrock	mesic	loamy	yes	frigid d/strudept
Greenwood	295							Organic Materials - Freshwater	frigid	loamy	no	mwd to swnd
Calden	296					A/D	6	Organic Materials - Freshwater	mesic	hermic	no	deep organic
Lovewell	307	0.6	2.0	0.60	2.0	A/D	6	Organic Materials - Freshwater	mesic	sapric	no	deep organic
Quonset	310	2.0	20.0	20.00	100.0	B	3	Flood Plain (Bottom Land)	frigid	silty	no	very fine sandy loam
Deerfield	313	6.0	20.0	20.00	100.0	B	3	Outwash and Stream Terraces	mesic	sandy-skeletal	no	single grain in C

RIP RAP CALCULATIONS

Residential Development
JL Terra
Barrington, NH

Beals Associates, PLLC
70 Portsmouth Ave
Stratam, NH

Rip Rap equations were obtained from the NH *Stormwater Manual Control Handbook for Urban and Developing Areas in New*
Rip Rap was sized for the 50 year storm event (7.00").

TAILWATER < HALF THE Do

$La = (1.8 \times Q) / Do^{3/2} + (7 \times Do)$ $Q = \text{Peak Flow \& Do is Diameter of Pipe}$

$W = La + 3Do$ or defined channel width

$d50 = (0.02 \times Q^{4/3}) / (Tw \times Do)$ $Tw = \text{Tailwater Depth}$

$T = \text{Largest stone size of } d50 \times 1.5$ $T = \text{Thickness of Apron}$

$d50 = \text{Median Stone Size (0.25' Min.)}$

Culvert or Catch Basin (Sta. No.)	Tail Water (Feet) Tw	Dischg. (C.F.S.) Q	Dia. of Pipe Do	Length of Rip Rap La (feet)	Width of Rip Rap W (feet)	Calculated Rip Rap (0.25 Min)	Actual Rip Rap (Feet)	Thickness of Apron (Feet)
24" HDPE (DMH 1)	1.02	12.21	2.00	21.8	27.8	0.28	0.25	0.56
12" HDPE (CB 7A)	1.31	3.64	1.25	13.4	17.2	0.07	0.25	0.56

Table 7-24 -- Recommended Rip Rap Gradation Ranges

d50 Size =	0.25 Feet		3 Inches		0.5 Feet		6 Inches	
	Size of Stone (Inches)				Size of Stone (Inches)			
% of Weight Smaller Than the Given d50 Size	From		To		From		To	
100%	5		6		9		12	
85%	4		5		8		11	
50%	3		5		6		9	
15%	1		2		2		3	



STORMWATER POND DESIGN CRITERIA

Env-Wq 1508.03

Type/Node Name: **Wet Pond/1P**

Enter the type of stormwater pond (e.g., Wet Pond) and the node name in the drainage analysis, if applicable.

10.81	ac	A = Area draining to the practice	
2.43	ac	A _i = Impervious area draining to the practice	
0.22	decimal	I = Percent impervious area draining to the practice, in decimal form	
0.25	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
2.73	ac-in	WQV = 1" x R _v x A	
9,901	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
990	cf	10% x WQV (check calc for sediment forebay and micropool volume)	
4,950	cf	50% x WQV (check calc for extended detention volume)	
2,069	cf	V _{SED} = Sediment forebay volume	≥ 10%WQV
9,381	cf	V _{PP} = Permanent pool volume (volume below the lowest invert of the outlet structure) Attach stage-storage table.	
yes	cf	Extended Detention? ¹	≤ 50% WQV
520		V _{ED} = Volume of extended detention (if "yes" is given in box above)	
189.25		E _{ED} = Elevation of WQV if "yes" is given in box above ²	
0.01	cfs	2Q _{avg} = 2 * V _{ED} / 24 hrs * (1hr / 3600 sec) (used to check against Q _{EDmax} below)	
0.00	cfs	Q _{EDmax} = Discharge at the E _{ED} (attach stage-discharge table)	< 2Q _{avg}
96.26	hours	T _{ED} = Drawdown time of extended detention = 2V _{ED} /Q _{EDmax}	≥ 24-nrs
3.00	:1	Pond side slopes	≥ 3:1
189.50	ft	Elevation of seasonal high water table	
189.24	ft	Elevation of lowest pond outlet	
184.50	ft	Max floor = Maximum elevation of pond bottom (ft)	
181.24	ft	Minimum floor (to maintain depth at less than 8')	≤ 8 ft
184.50	ft	Elevation of pond floor ³	≤ Max floor and > Min floor
89.00	ft	Length of the flow path between the inlet and outlet at mid-depth	
28.00	ft	Average width ([average of the top width + average bottom width]/2)	
3.18	:1	Length to average width ratio	≥ 3:1
yes	Yes/No	Is the perimeter curvilinear.	← Yes
yes	Yes/No	Are the inlet and outlet located as far apart as possible.	← Yes
no	Yes/No	Is there a manually-controlled drain to dewater the pond over a 24hr period?	
		If no state why: Submersible pump will be used to dewater if necessary	
N/A		What mechanism is proposed to prevent the outlet structure from clogging (applicable for orifices/weirs with a dimension of <6")?	
190.42	ft	Peak elevation of the 50-year storm event	
192.00	ft	Berm elevation of the pond	
YES		50 peak elevation ≤ the berm elevation?	← yes

1. If the entire WQV is stored in the perm. pool, there is no extended det., and the following five lines do not apply.
2. This is the elevation of WQV if the hydrologic analysis is set up to include the permanent pool storage in the node description.
3. If the pond floor elevation is above the max floor elev., a hydrologic budget must be submitted to demonstrate that a minimum depth of 3 feet can be maintained. (First check whether a revised "lowest pond outlet" elev. will resolve the issue.)

Designer's Notes:

Stage-Discharge for Pond 1P: WET POND

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
184.50	0.00	186.58	0.00	188.66	0.00	190.74	24.20
184.54	0.00	186.62	0.00	188.70	0.00	190.78	25.16
184.58	0.00	186.66	0.00	188.74	0.00	190.82	26.13
184.62	0.00	186.70	0.00	188.78	0.00	190.86	27.11
184.66	0.00	186.74	0.00	188.82	0.00	190.90	28.12
184.70	0.00	186.78	0.00	188.86	0.00	190.94	29.15
184.74	0.00	186.82	0.00	188.90	0.00	190.98	30.18
184.78	0.00	186.86	0.00	188.94	0.00	191.02	31.23
184.82	0.00	186.90	0.00	188.98	0.00	191.06	32.29
184.86	0.00	186.94	0.00	189.02	0.00	191.10	33.36
184.90	0.00	186.98	0.00	189.06	0.00	191.14	34.44
184.94	0.00	187.02	0.00	189.10	0.00	191.18	35.53
184.98	0.00	187.06	0.00	189.14	0.00	191.22	36.64
185.02	0.00	187.10	0.00	189.18	0.00	191.26	37.75
185.06	0.00	187.14	0.00	189.22	0.00	191.30	38.88
185.10	0.00	187.18	0.00	189.26	0.04	191.34	40.02
185.14	0.00	187.22	0.00	189.30	0.20	191.38	41.17
185.18	0.00	187.26	0.00	189.34	0.42	191.42	42.33
185.22	0.00	187.30	0.00	189.38	0.70	191.46	43.50
185.26	0.00	187.34	0.00	189.42	1.02	191.50	44.68
185.30	0.00	187.38	0.00	189.46	1.38	191.54	45.87
185.34	0.00	187.42	0.00	189.50	1.78	191.58	47.07
185.38	0.00	187.46	0.00	189.54	2.21	191.62	48.28
185.42	0.00	187.50	0.00	189.58	2.67	191.66	49.50
185.46	0.00	187.54	0.00	189.62	3.16	191.70	50.74
185.50	0.00	187.58	0.00	189.66	3.67	191.74	51.98
185.54	0.00	187.62	0.00	189.70	4.21	191.78	53.23
185.58	0.00	187.66	0.00	189.74	4.77	191.82	54.49
185.62	0.00	187.70	0.00	189.78	5.36	191.86	55.77
185.66	0.00	187.74	0.00	189.82	5.96	191.90	57.05
185.70	0.00	187.78	0.00	189.86	6.58	191.94	58.34
185.74	0.00	187.82	0.00	189.90	7.19	191.98	59.64
185.78	0.00	187.86	0.00	189.94	7.82		
185.82	0.00	187.90	0.00	189.98	8.46		
185.86	0.00	187.94	0.00	190.02	9.11		
185.90	0.00	187.98	0.00	190.06	9.80		
185.94	0.00	188.02	0.00	190.10	10.52		
185.98	0.00	188.06	0.00	190.14	11.25		
186.02	0.00	188.10	0.00	190.18	12.00		
186.06	0.00	188.14	0.00	190.22	12.76		
186.10	0.00	188.18	0.00	190.26	13.55		
186.14	0.00	188.22	0.00	190.30	14.37		
186.18	0.00	188.26	0.00	190.34	15.20		
186.22	0.00	188.30	0.00	190.38	16.05		
186.26	0.00	188.34	0.00	190.42	16.91		
186.30	0.00	188.38	0.00	190.46	17.79		
186.34	0.00	188.42	0.00	190.50	18.67		
186.38	0.00	188.46	0.00	190.54	19.57		
186.42	0.00	188.50	0.00	190.58	20.48		
186.46	0.00	188.54	0.00	190.62	21.40		
186.50	0.00	188.58	0.00	190.66	22.33		
186.54	0.00	188.62	0.00	190.70	23.26		

NH-1263-Proposed 12-20

Type III 24-hr 50 YR Rainfall=7.00"

Prepared by {enter your company name here}

Printed 1/5/2021

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Stage-Area-Storage for Pond 1P: WET POND

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
184.50	886	0	189.70	3,849	11,567
184.60	929	91	189.80	3,918	11,955
184.70	972	186	189.90	3,987	12,350
184.80	1,014	285	190.00	4,056	12,753
184.90	1,057	389	190.10	4,124	13,162
185.00	1,100	497	190.20	4,193	13,577
185.10	1,143	609	190.30	4,262	14,000
185.20	1,186	725	190.40	4,330	14,430
185.30	1,228	846	190.50	4,399	14,866
185.40	1,271	971	190.60	4,467	15,309
185.50	1,314	1,100	190.70	4,535	15,760
185.60	1,357	1,234	190.80	4,604	16,217
185.70	1,400	1,371	190.90	4,673	16,680
185.80	1,442	1,513	191.00	4,741	17,151
185.90	1,485	1,660	191.10	4,809	17,629
186.00	1,528	1,811	191.20	4,878	18,113
186.10	1,586	1,966	191.30	4,947	18,604
186.20	1,643	2,128	191.40	5,015	19,102
186.30	1,701	2,295	191.50	5,084	19,607
186.40	1,758	2,468	191.60	5,152	20,119
186.50	1,816	2,646	191.70	5,220	20,638
186.60	1,873	2,831	191.80	5,289	21,163
186.70	1,931	3,021	191.90	5,358	21,695
186.80	1,988	3,217	192.00	5,426	22,235
186.90	2,046	3,419			
187.00	2,104	3,626			
187.10	2,161	3,839			
187.20	2,219	4,058			
187.30	2,276	4,283			
187.40	2,334	4,514			
187.50	2,391	4,750			
187.60	2,449	4,992			
187.70	2,506	5,240			
187.80	2,564	5,493			
187.90	2,621	5,752			
188.00	2,679	6,018			
188.10	2,748	6,289			
188.20	2,817	6,567			
188.30	2,886	6,852			
188.40	2,954	7,144			
188.50	3,023	7,443			
188.60	3,092	7,749			
188.70	3,161	8,061			
188.80	3,230	8,381			
188.90	3,299	8,707			
189.00	3,368	9,041			
189.10	3,436	9,381			
189.20	3,505	9,728			
189.30	3,574	10,082			
189.40	3,643	10,443			
189.50	3,712	10,811			
189.60	3,781	11,185			



FILTRATION PRACTICE DESIGN CRITERIA (Env-Wq 1508.07)

Type/Node Name: _____

Bioret pond/2P

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

<u>yes</u>		Check if you reviewed the restrictions on unlined systems outlined in Env-Wq 1508.07(a).	
<u>2.10</u>	ac	A = Area draining to the practice	
<u>0.90</u>	ac	A _i = Impervious area draining to the practice	
<u>0.43</u>	decimal	I = Percent impervious area draining to the practice, in decimal form	
<u>0.44</u>	unitless	R _v = Runoff coefficient = 0.05 + (0.9 x I)	
<u>0.92</u>	ac-in	WQV = 1" x R _v x A	
<u>3,331</u>	cf	WQV conversion (ac-in x 43,560 sf/ac x 1ft/12")	
<u>833</u>	cf	25% x WQV (check calc for sediment forebay volume)	
<u>2,499</u>	cf	75% x WQV (check calc for surface sand filter volume)	
<u>Sed Forebay</u>		Method of Pretreatment? (not required for clean or roof runoff)	
<u>1,108</u>	cf	V _{SED} = Sediment forebay volume, if used for pretreatment	≥ 25%WQV
Calculate time to drain if system IS NOT underdrained:			
<u>4,904</u>	sf	A _{SA} = Surface area of the practice	
<u>3.00</u>	iph	K _{sat DESIGN} = Design infiltration rate ¹	
<u>n/a</u>	Yes/No	If K _{sat} (prior to factor of safety) is < 0.50 iph, has an underdrain been provided? (Use the calculations below)	
<u>2.7</u>	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
<u>188.50</u>	feet	E _{FC} = Elevation of the bottom of the filter course material ²	
<u>n/a</u>	feet	E _{UD} = Invert elevation of the underdrain (UD), if applicable	
<u>187.50</u>	feet	E _{SHWT} = Elevation of SHWT (if none found, enter the lowest elevation of the test pit)	
<u>183.75</u>	feet	E _{ROCK} = Elevation of bedrock (if none found, enter the lowest elevation of the test pit)	
<u>#VALUE!</u>	feet	D _{FC to UD} = Depth to UD from the bottom of the filter course	≥ 1'
<u>4.75</u>	feet	D _{FC to ROCK} = Depth to bedrock from the bottom of the filter course	≥ 1'
<u>1.00</u>	feet	D _{FC to SHWT} = Depth to SHWT from the bottom of the filter course	≥ 1'
<u>191.29</u>	ft	Peak elevation of the 50-year storm event (infiltration can be used in analysis)	
<u>191.50</u>	ft	Elevation of the top of the practice	
<u>YES</u>		50 peak elevation ≤ Elevation of the top of the practice	← yes
If a surface sand filter or underground sand filter is proposed:			
<u>YES</u>	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
<u>Sheet</u>		Note what sheet in the plan set contains the filter course specification.	
<u>Yes/No</u>		Access grate provided?	← yes

If a bioretention area is proposed:			
YES	ac	Drainage Area no larger than 5 ac?	← yes
9,503	cf	V = Volume of storage ³ (attach a stage-storage table)	≥ WQV
18.0	inches	D _{FC} = Filter course thickness	18", or 24" if within GPA
Sheet	18	Note what sheet in the plan set contains the filter course specification	
3.0	:1	Pond side slopes	> 3:1
Sheet	18	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
Sheet		Note what sheet in the plan set contains the filter course spec.	mod. 304.1 (see spec)

1. Rate of the limiting layer (either the filter course or the underlying soil). $K_{sat_{design}}$ includes factor of safety. 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 structure, 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:

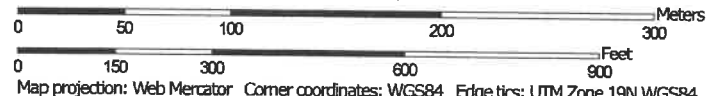
Stage-Area-Storage for Pond 2P: BIORET POND

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
187.50	4,904	0	190.10	4,990	4,663
187.55	4,904	98	190.15	5,033	4,914
187.60	4,904	196	190.20	5,076	5,166
187.65	4,904	294	190.25	5,119	5,421
187.70	4,904	392	190.30	5,162	5,678
187.75	4,904	490	190.35	5,205	5,938
187.80	4,904	588	190.40	5,248	6,199
187.85	4,904	687	190.45	5,291	6,462
187.90	4,904	785	190.50	5,334	6,728
187.95	4,904	883	190.55	5,377	6,996
188.00	4,904	981	190.60	5,420	7,266
188.05	4,904	1,079	190.65	5,463	7,538
188.10	4,904	1,177	190.70	5,506	7,812
188.15	4,904	1,275	190.75	5,550	8,088
188.20	4,904	1,373	190.80	5,593	8,367
188.25	4,904	1,471	190.85	5,636	8,648
188.30	4,904	1,569	190.90	5,679	8,931
188.35	4,904	1,667	190.95	5,722	9,216
188.40	4,904	1,765	191.00	5,765	9,503
188.45	4,904	1,864	191.05	5,808	9,792
188.50	4,904	1,962	191.10	5,851	10,084
188.55	4,904	2,035	191.15	5,894	10,377
188.60	4,904	2,109	191.20	5,937	10,673
188.65	4,904	2,182	191.25	5,980	10,971
188.70	4,904	2,256	191.30	6,023	11,271
188.75	4,904	2,329	191.35	6,066	11,573
188.80	4,904	2,403	191.40	6,109	11,877
188.85	4,904	2,477	191.45	6,152	12,184
188.90	4,904	2,550	191.50	6,195	12,493
188.95	4,904	2,624			
189.00	4,904	2,697			
189.05	4,904	2,771			
189.10	4,904	2,844			
189.15	4,904	2,918			
189.20	4,904	2,991			
189.25	4,904	3,065			
189.30	4,904	3,139			
189.35	4,904	3,212			
189.40	4,904	3,286			
189.45	4,904	3,359			
189.50	4,904	3,433			
189.55	4,904	3,506			
189.60	4,904	3,580			
189.65	4,904	3,653			
189.70	4,904	3,727			
189.75	4,904	3,801			
189.80	4,904	3,874			
189.85	4,904	3,948			
189.90	4,904	4,021			
189.95	4,904	4,095			
190.00	4,904	4,168			
190.05	4,947	4,415			

Custom Soil Resource Report Soil Map



Map Scale: 1:3,560 if printed on A portrait (8.5" x 11") sheet.



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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HaA	Hinckley loamy sand, 0 to 3 percent slopes	0.0	0.0%
WdA	Windsor loamy sand, 0 to 3 percent slopes	32.6	100.0%
Totals for Area of Interest		32.6	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,