STORMWATER MANAGEMENT REPORT

MOULTONBOROUGH BAY & WINTER HARBOR WATERSHED MANAGEMENT PROJECTS **TUFTONBORO, NEW HAMPSHIRE**

Prepared for: LAKE WINNEPESAUKEE ASSOCIATION P.O. BOX 1624 MEREDITH, NH 03253



Prepared by:

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1.0 DRAINAGE DESIGN NARRATIVE

EXISTING CONDITIONS

Site 1-01A: Melvin Village Boat Launch

Site 1-01A total drainage area is approximately 15,500 SF and is comprised of 3,400 SF impervious pavement, 6,400 SF of compacted gravel, and the remaining 5,700 SF is pervious, green space. Today, stormwater drains off of Route 109 and runs down Lake Road. A minor portion of stormwater runoff generated by Route 109 is captured by a conveyance swale along the western edge of Lake Road. All remaining runoff flows down the east side of Lake Road where a gully has formed over time. Sheet flow becomes concentrated flow as stormwater flows across the property from north to south. At the boat launch, untreated stormwater flow enters Melvin Bay.

Site 1-01B: Roadside Rain Garden off Route 109

Site 1-01B total drainage area is approximately 4,700 SF and is comprised of 2,575 SF impervious pavement and the remaining 2,125 SF is pervious, green space. Today, stormwater drains off of Route 109 and enters an existing catch basin listed as SP1 on the existing drainage map for sites 1-01A & 1-01B. Stormwater enters the SP1 and via a closed pipe drainage system is directly discharged into Melvin Bay prior to receiving any formal stormwater treatment.

Site 1-12: New Road Bioswales

Site 1-12 total drainage area is approximately 17,350 SF and is comprised of 8,500 SF impervious pavement and the remaining 8,850 SF is pervious, green space. Today, New Road has a country-style drainage system lacking formal edge restraints and therefore stormwater runoff exits the paved surface at the point(s) of least resistance. Under the current conditions, road runoff exits in four locations at each terminus of the headwall culvert crossing beneath New Road. Loose aggregate and topsoil are being eroded where stormwater flows concentrate down the steep side-slopes and into Melvin River.

Site 4-07: Rain Garden on Northwoods Road

Site 4-07 total drainage area is approximately 11,700 SF and is comprised of 8,500 SF of compacted gravel and the remaining 3,200 SF is pervious, green space. Today, the Northwoods Road is compacted gravel where an existing culvert crosses at the low point. Stormwater runoff generated within the drainage area flows toward the stream on either side of Northwoods Road. Previous efforts to control stormwater flow and prevent erosion were observed up-gradient of the proposed rain garden.

Ultimately, all four drainage areas impact the water quality of Lake Winnipesaukee.

PROPOSED CONDITIONS

Site 1-01A: Melvin Village Boat Launch

The design intent is to embrace stormwater flow patterns where they exist on-site to reduce earthwork and construction costs. As a result, the Lake Road shoulder will become a stabilized inlet swale which will collect and convey stormwater runoff into a sediment forebay. A bioretention area will collect and treat runoff as it exits the sediment forebay and will be connected to another bioretention area via a perforated underdrain and daylit conveyance swale. Based upon the total drainage area and associated land cover/runoff coefficients, the proposed drainage system is sized to collect and treat the full 1-inch water quality volume.

Site 1-01B: Roadside Rain Garden off Route 109

The design intent is to embrace stormwater flow patterns where they exist on-site to reduce earthwork and construction costs. As a result, available underutilized space within the public R.O.W will be retrofitted into a stepped rain garden. Stormwater will be directed into the drainage system via two paved inlet flumes and enter a sediment forebay for easy maintenance. Based upon the total drainage area and associated land cover/runoff coefficients, the proposed drainage system is sized to collect and treat the 0.5-inch water quality volume.

Site 1-12: New Road Bioswales

The design intent is divert stormwater runoff off of New Road prior to reaching the headwall at the culvert crossing beneath New Road. To achieve positive drainage, the road shoulders must be stabilized and pitched off and away from the edge of pavement. Two bioswales are proposed to encourage drainage away from the culvert and into Melvin River. Once positive drainage is achieved by embracing alternative low points for drainage relief off New Road, the eroded slopes at the headwall terminus' will be restored using biodegradable jute netting and native plug plantings.

Site 4-07: Rain Garden on Northwoods Road

The design intent is to embrace stormwater flow patterns where they exist on-site to reduce earthwork and construction costs. A sediment forebay is proposed to provide pretreatment and easy maintenance, which will overflow into a shallow, linear rain garden sized to treat 0.5-inch water quality volume.

2.0 DRAINAGE DESIGN OBJECTIVES

The proposed GSI stormwater management systems are designed to meet the following major objectives:

- Capture and treat at least the first half-inch of stormwater runoff;
 - Where possible, capture and treat the full one-inch of stormwater runoff.
- Ensure peak flow rates (25-year storm) will not compromise public safety; and
- Strive for high-impact stormwater management solutions on public land.

DESIGN METHODOLOGY

The drainage designs were completed by performing a series of tasks that included:

- Determining the total drainage areas, land coverage and individual subcatchments;
- Sizing the best management practices (BMPs);
- Modeling the proposed drainage network with HydroCAD® software.

The design objective is to improve water quality by sizing each system to achieve up to the full one-inch of runoff for each site. Pre-development and post-development conditions were modeled using HydroCAD software, which combines USDA Soil Conservation Service hydrology and hydraulic techniques (commonly known as SCS TR-55 and TR-20) to generate hydrographs (**Appendix C**). Updated rainfall values from the NRCC Extreme Precipitation for New England database were utilized for this analysis to better account for changing climate patterns than the formerly used and outdated Rainfall Frequency Atlas of the United States (TP40).

3.0 POLLUTANT CONTROLS DURING CONSTRUCTION

3.1 Structural Practices

The following are the structural practices that will be implemented as part of the construction activity.

- <u>Silt Sacks (or approved equivalent)</u> will be installed at identified existing catch basins and following construction of the proposed catch basins to prevent sedimentation during construction. The silt sack will be emptied/replaced and disposed of off-site if damage is observed.
- <u>Bioretention Area(s)</u> will be graded to within one foot of design elevations until site is fully stabilized to capture sediment during construction. Heavy equipment will not be allowed to operate on the surface location where the systems are planned because soil compaction can adversely impact their long-term performance. Light earth-moving equipment will be used for excavation and construction of the systems. All excavated materials from the area will be removed and disposed of in an approved location. All bioretention areas will be inspected at least once every seven calendar days and immediately after storm events by the Construction Manager.
- <u>Slope Stabilization</u> will occur immediately upon obtaining final grades as shown on the project site plans. Areas that fail to stabilize will be re-graded to final grade and stabilized as necessary. Amount of land disturbed will be minimized to reduce potential for erosion and sedimentation. Stabilization measures shall be initiated within 14 days following the end of construction at each portion of the site and as soon as practicable.

The entire stormwater management system including piping, inlets, bioretention facility, and leaching basins will be inspected upon completion of construction. Sediment will be removed from all elements of the stormwater management system. All control measures must be installed and maintained in accordance with manufacturer's specifications, good engineering

practices, and in accordance with this report (every seven calendar days and after storm events). If inspections show that a control has failed or been installed incorrectly, the Operator must replace or modify it within 24 hours.

3.2 Stabilization Practices

The amount of land disturbed during construction will be minimized to reduce the potential for erosion and sedimentation. Prompt surface stabilization will be practiced to control erosion in areas where disturbances cannot be avoided during construction. Stabilization measures shall be initiated within 14 days following the end of construction at each portion of the site. Exceptions to this requirement are allowable when snow cover prevents the initiation of stabilization within 14 days, in which case such measures shall be undertaken as soon as possible.

Stabilization measures that will be, or may be, used during construction are described below:

- <u>Temporary Seeding</u> Temporary seeding of disturbed surfaces with fast-growing grasses (annual rye) to provide greater resistance to stormwater runoff and/or wind erosion for areas where construction has temporarily ceased.
- <u>Permanent Seeding</u> Permanent seeding of surfaces with vegetation, including but not limited to grass, trees, bushes, and shrubs, to stabilize the soil. Establishing a permanent and sustainable ground cover at a site stabilizes the soil while reducing the sediment content in runoff.
- <u>Permanent Planting</u> –establish all planting as required at the completion of the project.
- Erosion Control Blankets- install erosion control blankets along all 3:1 slopes or greater.
- <u>Mulching</u> materials, including but not limited to hay, grass, woodchips, straw, and gravel will be placed on the soil surface to cover and hold in place disturbed soils.

Temporary seeding or other soil stabilization measures will be provided where construction activities have ceased at the site. Topsoil stockpiles will be temporarily seeded or covered to prevent erosion, and will be surrounded with silt fence or strawbales. When the site's final grade has been established, permanent vegetation will be planted on the disturbed areas. The vegetation will consist of grass, shrubs, bushes, and trees in the locations indicate on the plans.

3.3 Other Types of Controls

Additional controls/practices will be undertaken to reduce pollution in stormwater runoff flows which include, but are not limited to, control of off-site mud tracking from construction site, dust suppression, proper sanitary waste disposal, earthwork procedures timed and conducted in manners aimed to minimize erosion and sedimentation, snow removal plans, proper management of waste materials, proper management of hazardous waste, proper material stockpiling, and spill prevention and control measures.

- <u>Dust Suppression</u> Water sprays shall be used to control dust during extended dry periods during construction.
- <u>Earthwork</u> The exposure of disturbed surfaces to stormwater and potential stormwater erosion will be minimized by well organized earthwork procedures. Stabilization procedures shall be undertaken in accordance with this report. Grubbing during wet seasons will be avoided if feasible.
- <u>Waste Materials</u> Dumpsters rented from a licensed solid waste management company will be used to store solid waste and debris that cannot be recycled, reused or salvaged. The dumpsters will meet all local and state solid waste management regulations. Dumpsters will be covered when refuse is not being directly deposited or withdrawn from them. Potentially hazardous wastes will be separated from normal wastes, including segregation of storage areas and proper labeling of containers. Removal of all waste from the site will be performed by licensed contractors in accordance with applicable regulatory requirements and disposed of at either local or regional approved facilities. Waste materials will not be buried on-site. All site personnel will be instructed regarding the correct procedures for waste disposal. Notices stating these procedures will be posted at the site. Solvents and flushing materials used during construction and preoperational cleaning will be provided, handled, managed, and removed by the contractor for appropriate off-site disposal.
- <u>Hazardous Waste Materials</u> Any disposal of hazardous materials will be completed using the required paperwork. Copies will be provided to the Engineer and to the city.
- <u>Spill Prevention and Control Measures</u> To minimize the risk of spills or other accidental exposure of materials and substances to stormwater runoff, the following material management practices will be used throughout the project:
 - An effort will be made to store only enough products required to do the job.
 - All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
 - Products will be kept in their original containers with the original manufacturer's label.
 - Substances will not be mixed with one another unless recommended by the manufacturer.
 - Whenever possible, the maximum amount of a product will be used before disposing of the container.
 - Manufacturers' recommendations for proper use and disposal will be followed.
 - The site superintendent will conduct daily inspections to ensure proper use and disposal of materials.

To reduce the risk associated with hazardous materials used on the site, the following practices will be used:

- Products will be kept in original containers unless they are not resealable.
- Original labels and material safety data sheets will be retained and kept on-site; they contain important product information.
- If surplus product must be disposed of, manufacturers' or local and state recommended methods for proper disposal will be followed.
- <u>Materials List</u> Materials or substances listed below are expected to be present on-site during construction:

-	Concrete	-	Fertilizers
-	Asphalt	-	Petroleum Based Products
-	Paints (enamel and latex)	-	Cleaning Solvents
-	Metal Studs	-	Wood
-	Concrete	-	Tar
-	Sealants	-	Adhesives

The following product-specific practices will be followed on-site:

<u>Petroleum Products</u> - All on-site vehicles will be monitored for leaks and receive preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which area clearly labeled. Any asphalt substances used on-site will be applied according to the manufacturers' recommendations.

<u>Fertilizers</u> – Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to stormwater. Products will be stored in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.

<u>Paints</u> – All containers will be tightly sealed and stored indoors when not required for use. Excess paint will not be discharged to the storm sewer system but will be properly disposed of according to the manufacturers' instructions or state and local regulations.

<u>Concrete Trucks</u> – Concrete trucks will not be allowed to wash out or discharge surplus concrete or drum wash water on the site.

In addition to the good housekeeping and material management practices discussed in the previous sections of this plan, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of the procedures and location of the information and cleanup supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include, but not be limited to, brooms, dust pans, mops, rags, gloves, goggles, speedi-dry, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery. Spills large enough to reach the storm water system will be reported to the National Response Center at 1-800-424-8802.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate state or local government agency, regardless of the size.
- The site superintendent responsible for the day-to-day site operations will be the spill prevention and clean-up coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the onsite office trailer.

4.0 STORMWATER OPERATION AND MAINENANCE PLAN

All stormwater management measures and controls shall be operated and maintained appropriately during the construction phase of the project and during regular operation of the site in the post-construction period. The Contractor shall provide, inspect, and maintain all temporary control measures. The temporary stormwater controls will be inspected at least once every seven days and within 24 hours of storm events of 0.5 inches or greater, to prevent deficiencies in the effectiveness of the systems due to sediment build-up, damage, or deterioration. A summary of the maintenance plan during construction is presented below. Post-construction Operation and Maintenance Plans for each BMP are included in **Appendix G**.

Construction O&M

The temporary stormwater control system will be regularly inspected to ensure proper performance. The following operation and maintenance provisions will be provided:

- Silt Sacks/Socks shall be inspected for depth of sediment and any breaches will promptly be repaired or replaced when necessary.
- Sediment shall be removed where accumulation reaches one-third the above ground height of any barrier, temporary basin, inlet/outlet structure, or inlet protection device.
- Erosion control matting or blanket shall be inspected for tears and to ensure proper installation. Matting or blanket shall be replaced when necessary.
- Once each workday structural control measures receiving flows from areas that have not been stabilized by established permanent seeding shall be inspected.
- Remedial action shall be taken in areas where temporary and permanent seeding is deemed inefficient through weekly inspections to establish a stabilized surface. Other stabilization methods may be required.
- Tracked sediment shall be removed daily from roadways and other pavements in the vicinity of the project area.
- All BMPs will be cleared of accumulated foreign debris, including leaves and lawn cuttings.
- All grading will be inspected for slope integrity and erosion.
- All control measures will be inspected at least once every seven calendar days and within 24 hours after storm events of 0.5 inches or more.
- All signage and/or fencing demarking the project 'limits of disturbance' shall be replaced or repaired when necessary.
- Temporary tree protection shall be provided and remain in place for the duration of the construction activities.
- A maintenance inspection report should be submitted to the Town after each inspection.
- All measures will be maintained in good working order, if a repair is necessary, it will be initiated within 24 hours of discovery.

5.0 LONG-TERM POLLUTION PREVENTION PLAN

The long-term stormwater management system operator/manager is responsible for post construction pollution prevention and will be the party responsible for operation and maintenance of the stormwater and drainage improvements. The construction plans show the locations of the proposed improvements and the post construction features will be field surveyed and utilized for a Record Plan to conduct long-term maintenance.

Long-term pollution prevention measures implemented at the site will further reduce pollutants in stormwater discharges after construction. The following practices will be employed on an on-going basis.

- <u>Spill Prevention and Control Measures</u> To minimize the risk of spills or other accidental exposure of materials and substances to stormwater runoff, the material management practices will be practiced.
- <u>Landscaping Maintenance</u> –Landscaping maintenance will be conducted with no use of fertilizers and pesticides to protect the nearby wetland and water resources.
- Pet Waste Management Residents and visitors are encouraged to pick up after their pets.
- <u>Snow Management/Removal Plan</u> Plowed snow collected from the roads will be deposited onto available pervious locations, but not on top of the stormwater management system itself. Winter road salt and/or sand will not be stored on-site and will be used minimally as necessary for safe driving conditions at the site.
- <u>Pavement Sweeping Schedules</u> The roads will be swept annually after spring snowmelt.
- <u>Illicit Discharges</u> No septic pipes or floor drains will be connected to the drainage network or discharged to the drainage area of the proposed practices.

<u>Personnel Training</u> – All contracted personnel retained for work on site will be given a copy of this Plan and will receive training in applicable practices and implementation to prevent pollutants from entering the stormwater system.

Appendix A

Pre and Post-Drainage Area Maps



	Revisions
	Checked By:
	Horsley Witten Group, Inc. sustainable Environmental Solutions 90 Route 6A Sandwich, MA 02663 908-833-6600 voice 908-833-3160 fax Date: Design By: Dawn By: Date: Design By: Dawn By:
	Plan Set. MOULTONBOROUGH BAY 75% DESIGN SUBMISSION TUFTONBORO, NH Plan Tie. EXISTING DRAINAGE MAP 1-01A & 1-01B
77	Prepared For: Lake Winnipesaukee Association P.o. Box 1624 Meredith, NH 03253 Phone:(603) 581-6532 Fax:
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214B NAUMBURG LOAMY SAND (HSG A/D) 30	Project Number: 19058
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	MoultonBorough BAY 75% DESIGN SUBMISSION TUFTONBORO, NH	EXISTING DRAINAGE MAP 1-12A
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	MOULTONBOROUGH BAY 75% DESIGN SUBMISSION TUFTONBORO, NH	PROPOSED DRAINAGE MAP 1-12A
	Prepared For: Lake Whmipesaukee Association P.o. Box 1624 Phone:(603) 561-6632 Phone:(603) 561-6632	
	Survey Provided By: Horsley Witten Group, Inc. op Route 6A Phone(508) 833-660 Fax(509) 833-5150 DatechroVEMBER 2019	
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		Prepared For: Lake Winnipesaukee Association P.O. Box 1624 Meredith, NH 03253 Phone: (603) 561-6532 Fax	
		 Survey Provided By: Horsley Witten Group, Inc. 90 Route 8A Phone(308) 833-8600 Fac(508) 933-3150 Dated: NOVEMBER 2019 	
)	SOIL TYPES 47C HENNIKER FINE SANDY LOAM	Registration:	
١	464D WOODSTOCK-BICE-ROCK		
40	647B PILLSBURY FINE SANDY LOAM	Project Number: 19058	
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40 40 647B PILLSBURY FINE SANDY LOAN (HSG D)) M	Project Number: 19058 Sheet Number: 6 of 6	

Appendix B HydroCAD[®] Drainage Calculations



Moultonborough Bay	By:	JMP
PRE-DEVELOPMENT DRAINAGE ANALYSIS	Checked:	BAL
	Date	3/18/2020
	Revised:	4/3/2020

DRAINAGE AREA 1 (DA-1)

Coverage	Area (ft2)	Area (acres)	%	CN	Note
Impervious	4,495	0.10	32%	98	impervious
Roof	1,208	0.03	9%	98	impervious
Wooded	1,527	0.04	11%	70	woods (good condition)
Grass (Type A)	2,335	0.05	17%	74	lawns (good condition)
Gravel/Path	4,325	0.10	31%	96	Gravel or Stone
Subcatch total	13,890	0.32	100%	90	

Time of Concentration

1) Sheet		_
Туре	Pavement	
Length	50.0	ft
starting elev.	519	ft
ending elev.	517	ft
slope	0.040	ft/ft

2) Shallow Conce	entrated Flow		
Туре		Gravel/Grass/Gravel	
Length			200
starting elev.			517
ending elev.			507
slope			0.050

DRAINAGE AREA 3 (DA-3)

Coverage	Area (ft2)	Area (acres)	%		Note
Impervious	2,575	0.06	19%	98	impervious
Roof	0	0.00	0%	98	impervious
Wooded	905	0.02	7%	55	woods (good condition)
Grass (Type A)	1,220	0.03	9%	61	lawns (good condition)



Gravel/Path	0	0.00	0%	76	Gravel or Stone
Subcatch total	4,700	0.11	34%	80	

Time of Concentration

1) Sheet

Туре	Sheet	
Length		ft
starting elev.		ft
ending elev.		ft
slope	#DIV/0!	ft/ft

2) Shallow Concentrated Flow

Туре	
Length	
starting elev.	0
ending elev.	
slope	#DIV/0!

Coverage	Area (ft2)	Area (acres)	%		
Impervious	7,070	0.16	51%	98	impervious
Roof	1,208	0.03	9%	98	impervious
Wooded	2,432	0.06	18%	55	woods (good condition)
Grass (Type A)	2,335	0.05	17%	61	lawns (good condition)
Gravel/Path	4,325	0.10	31%	76	Gravel or Stone
Subcatch total	17,370	0.40	100%	82	



Moultonborough Bay POST-DEVELOPMENT DRAINAGE ANALYSIS

By:	JMP
Checked:	BAL
Date	2/24/2020
Revised:	8/6/2020

Land Coverage

Date: NOTES:

* All soils Type A

* P2 = 3.4 in. (TR - 20)

TOTAL AREA PRE

13,890 sf 0.319 acres

DRAINAGE AREA 1 (DA1)

				1	
Coverage	Area (ft2)	Area (acres)	%	CN	Note
Impervious	3,644	0.08	65%	98	impervious
Roof	491	0.01	9%	98	impervious
Wooded	0	0.00	0%	32	woods (good condition)
Grass (Type A)	1,383	0.03	25%	39	lawns (good condition)
Pond/SW	66	0.00	1%	98	Water surface
Gravel/Path	0	0.00	0%	96	Gravel or Stone
Subcatch total	5,584	0.13	100%	83	

Time of Concentration

1) Sheet		_
Туре	Grass	
Length	50.0	ft
starting elev.	100	ft
ending elev.	97	ft
slope	0.060	ft/ft

2) Shallow Concentrated Flow

Туре	Grass
Length	506
starting elev.	97
ending elev.	86
slope	0.022

DRAINAGE AREA 2 (DA2)

Coverage	Area (ft2)	Area (acres)	%	CN	Note
Impervious	855	0.02	10%	98	impervious
Roof	715	0.02	9%	98	impervious
Wooded	1,248	0.03	15%	55	woods (good condition)
Grass (Type A)	1,027	0.02	12%	61	lawns (good condition)
Pond/SW	310	0.01	4%	98	Water surface

TR20 - 24 hour Rainfall Data

Storm Freq.	P (in. of rainfall)
2	
10	
25	
100	



Moultonborough Bay	By:	JMP
PRE-DEVELOPMENT DRAINAGE ANALYSIS	Checked:	BAL
	Date	3/18/2020
	Revised:	4/3/2020

DRAINAGE AREA 1 (D-12A)

Coverage	Area (ft2)	Area (acres)	%	CN	Note
Impervious	5,276	0.12	49%	98	impervious
Wooded	5,424	0.12	51%	30	woods (good condition)
Grass (Type A)	0	0.00	0%	80	lawns (good condition)
Subcatch total	10,700	0.25	100%	64	

Time of Concentration

1) Sheet		_
Туре	Woods	
Length	50.0	ft
starting elev.	565	ft
ending elev.	563	ft
slope	0.040	ft/ft

2) Shallow Concentrated Flow

Туре	Woods/Grass
Length	383
starting elev.	563
ending elev.	549
slope	0.037

DRAINAGE AREA 2 (D-12B)

Coverage	Area (ft2)	Area (acres)	%		Note
Impervious	3,382	0.08	32%	98	impervious
Wooded	3,176	0.07	30%	80	woods (good condition)
Grass (Type A)	88	0.00	1%	61	lawns (good condition)
Subcatch total	6,646	0.15	62%	89	

Time of Concentration

1) Sheet		_
Туре	Woods	
Length	50.0	ft
starting elev.	557	ft
ending elev.	556	ft
slope	0.020	ft/ft

2) Shallow Concentrated Flow

Туре	Woods
Length	232
starting elev.	556
ending elev.	549
slope	0.030

Coverage	Area (ft2)	Area (acres)	%		
Impervious	8,658	0.20	81%	98	impervious
Wooded	8,600	0.20	80%		woods (good condition)
Grass (Type A)	88	0.00	1%		lawns (good condition)
Subcatch total	17,346	0.40	100%	49	



Gravel/Path	4,142	0.10	50%	85	Gravel or Stone
Subcatch total	8,297	0.19	100%	80	

Time of Concentration

1) Sheet		
Туре	Woods	
Length	50.0	ft
starting elev.	94	ft
ending elev.	93	ft
slope	0.020	ft/ft

2) Shallow Concentrated Flo	w
Туре	Woods/Grass
Length	105
starting elev.	93
ending elev.	83
slope	0.095

DRAINAGE AREA 3 (DA3)

Coverage	Area (ft2)	Area (acres)	%	CN	Note
Impervious	2,573	0.06	46%	98	impervious
Roof	0	0.00	0%	98	impervious
Wooded	790	0.02	14%	32	woods (good condition)
Grass (Type A)	1,255	0.03	22%	39	lawns (good condition)
Pond/SW	92	0.00	2%	98	Water surface
Gravel/Path	0	0.00	0%	76	Gravel or Stone
Subcatch total	4,710	0.11	84%	71	

Time of Concentration

1) Sheet		
Туре	Grass	
Length	50.0	ft
starting elev.	105	ft
ending elev.	102	ft
slope	0.060	ft/ft

2) Shallow Concentrated Flow

Туре	Grass
Length	509
starting elev.	102
ending elev.	84
slope	0.035

Coverage	Area (ft2)	Area (acres)	%		
Impervious	7,072	0.16	127%	98	impervious
Roof	1,206	0.03	22%	98	impervious
Wooded	2,038	0.05	36%	32	woods (good condition)
Grass (Type A)	3,665	0.08	66%	39	lawns (good condition)
Pond/SW	468	0.01	8%	98	Water surface
Gravel/Path	4,142	0.10	74%	76	Gravel or Stone
Subcatch total	18,591	0.43	100%		



Moultonborough Bay	By:	JMP
PRE-DEVELOPMENT DRAINAGE ANALYSIS	Checked:	BAL
	Date	3/18/2020
	Revised:	4/3/2020

DRAINAGE AREA 1 (DA1)

C	Aug. (4-2)	A	0/		Nete
Coverage	Area (ft2)	Area (acres)	%	CN	Note
Impervious	5,423	0.12	29%	98	impervious
Wooded	2,019	0.05	11%	30	woods (good condition)
Wooded	8,117	0.19	43%	77	woods (good condition)
Grass (Type A)	11,261	0.26	60%	80	lawns (good condition)
Subcatch total	18,703	0.62	100%	79	

Time of Concentration

1) Sheet		_
Туре	Woods	
Length	50.0	ft
starting elev.	565	ft
ending elev.	563	ft
slope	0.040	ft/ft

2) Shallow Concentrated Flor	W
Туре	Woods/Grass
Length	383
starting elev.	563
ending elev.	549
slope	0.037

DRAINAGE AREA 2 (DA2)

Coverage	Area (ft2)	Area (acres)	%		Note
Impervious	2,939	0.07	16%	98	impervious
Wooded	2,931	0.07	16%	80	woods (good condition)
Subcatch total	5,870	0.13	31%	89	

Time of Concentration

1) Sheet		
Туре	Woods	
Length	50.0	ft
starting elev.	557	ft
ending elev.	556	ft
slope	0.020	ft/ft

2) Shallow Concentrated Flow

Туре	Woods
Length	232
starting elev.	556
ending elev.	549
slope	0.030

Coverage	Area (ft2)	Area (acres)	%		
Impervious	8,362	0.19	45%	98	impervious
Wooded	4,950	0.11	26%		woods (good condition)
Grass (Type A)	11,261	0.26	60%		lawns (good condition)
Subcatch total	24,573	0.56	100%	33	



Moultonborough Bay	By:	JMP
PRE-DEVELOPMENT DRAINAGE ANALYSIS	Checked:	BAL
	Date	3/18/2020
	Revised:	4/3/2020

DRAINAGE AREA 1 (DA1)

Coverage	Area (ft2)	Area (acres)	%	CN	Note
Wooded	1,063	0.02	9%	70	woods (good condition)
Wooded	2,151	0.05	18%	77	woods (good condition)
Gravel/Path	8,502	0.20	73%	96	Gravel or Stone
Subcatch total	11,716	0.27	100%	90	

Time of Concentration

1) Sheet

/		
Туре		
Length	50.0	ft
starting elev.	543	ft
ending elev.	537	ft
slope	0.120	ft/ft

2) Shallow Concentrated Flow

Туре	
Length	446
starting elev.	537
ending elev.	496
slope	0.092



Coverage	Area (ft2)	Area (acres)	%		
Wooded	3,214	0.07	27%		woods (good condition)
Gravel/Path	8,502	0.20	73%		Gravel or Stone
Subcatch total	11,716	0.27	100%	#REF!	

Appendix C Hydrographs (WQv, 2-YR, 10-YR)



Project Notes

Rainfall events imported from "19058 1-01A PR.hcp"

Event#	Event	Storm Type	Curve	Mode	Duration	B/B	Depth	AMC
	Name				(hours)		(inches)	
1	2-YR	Type III 24-hr		Default	24.00	1	3.06	2
2	10-YR	Type III 24-hr		Default	24.00	1	4.56	2
3	WQv	Type III 24-hr		Default	24.00	1	1.21	2

Rainfall Events Listing (selected events)

Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.054	74	>75% Grass cover, Good, HSG C (DA1A)
0.099	96	Gravel surface, HSG C (DA1A)
0.103	98	Paved parking, HSG D (DA1A)
0.028	98	Roofs, HSG D (DA1A)
0.035	70	Woods, Good, HSG C (DA1A)
0.319	90	TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.000	HSG A	
0.000	HSG B	
0.188	HSG C	DA1A
0.131	HSG D	DA1A
0.000	Other	
0.319		TOTAL AREA

 HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.054	0.000	0.000	0.054	>75% Grass cover, Good	DA1A
0.000	0.000	0.099	0.000	0.000	0.099	Gravel surface	DA1A
0.000	0.000	0.000	0.103	0.000	0.103	Paved parking	DA1A
0.000	0.000	0.000	0.028	0.000	0.028	Roofs	DA1A
0.000	0.000	0.035	0.000	0.000	0.035	Woods, Good	DA1A
0.000	0.000	0.188	0.131	0.000	0.319	TOTAL AREA	

Ground Covers (all nodes)

Type III 24-hr 2-YR Rainfall=3.06" Printed 8/6/2020 LC Page 7

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Boat Launch	Runoff Area=13,890 sf 41.06% Impervious Runoff Depth>1.92"
	Tc=5.0 min CN=90 Runoff=0.76 cfs 0.051 af

Pond SP1: Moultonborough Bay

Inflow=0.76 cfs 0.051 af Primary=0.76 cfs 0.051 af

Total Runoff Area = 0.319 acRunoff Volume = 0.051 afAverage Runoff Depth = 1.92"58.94% Pervious = 0.188 ac41.06% Impervious = 0.131 ac

Summary for Subcatchment DA1A: Boat Launch

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.76 cfs @ 12.07 hrs, Volume= 0.051 af, Depth> 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-YR Rainfall=3.06"

Ar	ea (sf)	CN	Description			
	4,495	98	Paved park	ing, HSG D)	
	1,208	98	Roofs, HSC	6 D		
	1,527	70	Woods, Go	od, HSG C		
	2,335	74	>75% Gras	s cover, Go	bod, HSG C	
	4,325	96	Gravel surfa	ace, HSG C		
	13,890	90	Weighted A	verage		
	8,187		58.94% Per	vious Area		
	5,703		41.06% Imp	ervious Are	ea	
-		~		• •		
IC	Length	Slop	e Velocity	Capacity	Description	
(min)	(teet)	(ft/f	t) (ft/sec)	(cts)		
5.0					Direct Entry,	

Subcatchment DA1A: Boat Launch


Summary for Pond SP1: Moultonborough Bay

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

Inflow Area	a =	0.319 ac, 4	1.06% Imp	ervious,	Inflow De	epth > 1	.92" f	or 2-Y	'R event	
Inflow	=	0.76 cfs @	12.07 hrs,	Volume	=	0.051 a	f			
Primary	=	0.76 cfs @	12.07 hrs,	Volume	=	0.051 a	f, Atten	= 0%,	Lag= 0.0	min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Moultonborough Bay

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Boat Launch	Runoff Area=13,890 sf 41.06% Impervious Runoff Depth>3.26"
	Tc=5.0 min CN=90 Runoff=1.26 cfs 0.087 af

Pond SP1: Moultonborough Bay

Inflow=1.26 cfs 0.087 af Primary=1.26 cfs 0.087 af

Total Runoff Area = 0.319 acRunoff Volume = 0.087 afAverage Runoff Depth = 3.26"58.94% Pervious = 0.188 ac41.06% Impervious = 0.131 ac

Summary for Subcatchment DA1A: Boat Launch

[49] Hint: Tc<2dt may require smaller dt

Runoff = 1.26 cfs @ 12.07 hrs, Volume= 0.087 af, Depth> 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-YR Rainfall=4.56"

Area	ı (sf)	CN	Description			
4	,495	98	Paved park	ing, HSG D		
1,	,208	98	Roofs, HSC	δĎ		
1,	,527	70	Woods, Go	od, HSG C		
2,	,335	74	>75% Gras	s cover, Go	ood, HSG C	
4,	,325	96	Gravel surfa	ace, HSG C)	
13,	,890	90	Weighted A	verage		
8,	,187		58.94% Pei	vious Area		
5,	,703		41.06% Imp	pervious Are	ea	
Tc Le	ength	Slope	e Velocity	Capacity	Description	
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)		
5.0					Direct Entry,	

Subcatchment DA1A: Boat Launch



Summary for Pond SP1: Moultonborough Bay

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

Inflow Area	a =	0.319 ac, 4	1.06% Imp	ervious,	Inflow De	epth > 🗧	3.26	6" for 1	0-YR eve	nt
Inflow	=	1.26 cfs @	12.07 hrs,	Volume	=	0.087 a	af			
Primary	=	1.26 cfs @	12.07 hrs,	Volume	=	0.087 a	af, A	Atten= 0%	%, Lag=().0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Moultonborough Bay

Type III 24-hr WQv Rainfall=1.21" Printed 8/6/2020 LC______Page 13

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1A: Boat LaunchRunoff Area=13,890 sf 41.06% Impervious Runoff Depth>0.43"
Tc=5.0 min CN=90 Runoff=0.17 cfs 0.011 af

Pond SP1: Moultonborough Bay

Inflow=0.17 cfs 0.011 af Primary=0.17 cfs 0.011 af

Total Runoff Area = 0.319 acRunoff Volume = 0.011 afAverage Runoff Depth = 0.43"58.94% Pervious = 0.188 ac41.06% Impervious = 0.131 ac

Summary for Subcatchment DA1A: Boat Launch

[49] Hint: Tc<2dt may require smaller dt

Runoff 0.17 cfs @ 12.08 hrs, Volume= 0.011 af, Depth> 0.43" =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

Ai	rea (sf)	CN	Description			
	4,495	98	Paved park	ing, HSG D)	
	1,208	98	Roofs, HSC	βĎ		
	1,527	70	Woods, Go	od, HSG C		
	2,335	74	>75% Gras	s cover, Go	ood, HSG C	
	4,325	96	Gravel surfa	ace, HSG C)	
	13,890	90	Weighted A	verage		
	8,187		58.94% Per	vious Area		
	5,703		41.06% Imp	pervious Are	ea	
Та	Longth	Slor	o Volocity	Conocity	Description	
(min)	(foot)	010µ /#/		Capacity (cfo)	Description	
(11111)	(ieet)	(11/1	(it/sec)	(CIS)		
5.0					Direct Entry,	

Subcatchment DA1A: Boat Launch



Hydrograph

Summary for Pond SP1: Moultonborough Bay

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

Inflow Area	a =	0.319 ac, 4	1.06% Impe	ervious,	Inflow D	epth >	0.43	" for WC	Qv event	
Inflow	=	0.17 cfs @	12.08 hrs,	Volume	=	0.011 a	af			
Primary	=	0.17 cfs @	12.08 hrs,	Volume	=	0.011 a	af, A	Atten= 0%,	Lag= 0.0	min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Moultonborough Bay



Event#	Event	Storm Type	Curve	Mode	Duration	B/B	Depth	AMC
	Name				(hours)		(inches)	
1	2-YR	Type III 24-hr		Default	24.00	1	3.06	2
2	10-YR	Type III 24-hr		Default	24.00	1	4.56	2
3	WQv	Type III 24-hr		Default	24.00	1	1.21	2

Rainfall Events Listing (selected events)

Area Listing (all nodes)

Area	CN	Description
 (acres)		(subcatchment-numbers)
0.055	74	>75% Grass cover, Good, HSG C (DA-1, DA-2)
0.095	89	Gravel roads, HSG C (DA-2)
0.020	98	Paved parking, HSG C (DA-2)
0.084	98	Paved parking, HSG D (DA-1)
0.011	98	Roofs, HSG D (DA-1)
0.016	98	Unconnected roofs, HSG C (DA-2)
0.009	98	Water Surface, HSG C (DA-1, DA-2)
0.029	70	Woods, Good, HSG C (DA-2)
0.319	89	TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.000	HSG A	
0.000	HSG B	
0.224	HSG C	DA-1, DA-2
0.095	HSG D	DA-1
0.000	Other	
0.319		TOTAL AREA

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HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
0.000	0.000	0.055	0.000	0.000	0.055	>75% Grass cover, Good	DA-1,
							DA-2
0.000	0.000	0.095	0.000	0.000	0.095	Gravel roads	DA-2
0.000	0.000	0.020	0.084	0.000	0.103	Paved parking	DA-1,
							DA-2
0.000	0.000	0.000	0.011	0.000	0.011	Roofs	DA-1
0.000	0.000	0.016	0.000	0.000	0.016	Unconnected roofs	DA-2
0.000	0.000	0.009	0.000	0.000	0.009	Water Surface	DA-1,
							DA-2
0.000	0.000	0.029	0.000	0.000	0.029	Woods, Good	DA-2
0.000	0.000	0.224	0.095	0.000	0.319	TOTAL AREA	

Ground Covers (all nodes)

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	Pipe Listing (all nodes)								
Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	P1	510.50	508.75	82.0	0.0213	0.013	4.0	0.0	0.0

Ding Listing (all nodes)

19058 1-01A PR	Type III 24-hr 2-YR Rainfall=3.06"
Prepared by {enter your company name here}	Printed 8/6/2020
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Time span=5.00-20.00 h Runoff by SCS TR-20 meth Reach routing by Stor-Ind+Trans meth	rs, dt=0.05 hrs, 301 points nod, UH=SCS, Weighted-CN nod - Pond routing by Stor-Ind method
Subcatchment DA-1: Access Drive Runo	ff Area=5,584 sf 75.23% Impervious Runoff Depth>2.09" Tc=5.0 min CN=92 Runoff=0.33 cfs 0.022 af
Subcatchment DA-2: Boat Launch Runo	ff Area=8,297 sf 22.66% Impervious Runoff Depth>1.60" Tc=5.0 min CN=86 Runoff=0.38 cfs 0.025 af
Reach R1: Swale Avg. Flow n=0.030 L=45.0' S=	Depth=0.02' Max Vel=0.74 fps Inflow=0.01 cfs 0.000 af 0.0667 '/' Capacity=10.07 cfs Outflow=0.01 cfs 0.000 af
Pond P1: BIO 1 Point Primary=0.31 cfs 0.019 af	eak Elev=512.81' Storage=58 cf Inflow=0.33 cfs 0.022 af Secondary=0.01 cfs 0.000 af Outflow=0.33 cfs 0.021 af
Pond P2: BIO 2 Per Discarded=0.01 cfs 0.006 af Primary=0.19 cfs 0.014 af	ak Elev=507.92' Storage=424 cf Inflow=0.70 cfs 0.045 af Secondary=0.49 cfs 0.017 af Outflow=0.69 cfs 0.037 af
Pond SP1: Moultonborough Bay	Inflow=0.68 cfs 0.031 af Primary=0.68 cfs 0.031 af

Total Runoff Area = 0.319 acRunoff Volume = 0.048 afAverage Runoff Depth = 1.80"56.19% Pervious = 0.179 ac43.81% Impervious = 0.140 ac

Summary for Subcatchment DA-1: Access Drive

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.33 cfs @ 12.07 hrs, Volume= 0.022 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-YR Rainfall=3.06"

A	rea (sf)	CN	Description				
	3,644	98	Paved park	ing, HSG D)		
	491	98	Roofs, HSC	Ď			
	0	70	Woods, Go	od, HSG C			
	1,383	74	>75% Gras	s cover, Go	ood, HSG C		
	0	80	>75% Gras	s cover, Go	ood, HSG D		
	0	96	Gravel surfa	ace, HSG C			
	66	98	Water Surfa	ice, HSG C			
	5,584	92	Weighted A	verage			
	1,383		24.77% Per	vious Area			
	4,201		75.23% Impervious Area				
Тс	l enath	Slop	e Velocitv	Capacity	Description		
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)			
5.0					Direct Entry,		

Subcatchment DA-1: Access Drive



Summary for Subcatchment DA-2: Boat Launch

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.38 cfs @ 12.08 hrs, Volume= 0.025 af, Depth> 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-YR Rainfall=3.06"

A	rea (sf)	CN	Description			
	855	98	Paved parking,	HSG C		
	715	98	Unconnected ro	ofs, HS	SG C	
	1,248	70	Woods, Good, I	HSG C		
	1,027	74	>75% Grass co	ver, Go	od, HSG C	
	310	98	Water Surface,	HSG C		
	4,142	89	Gravel roads, H	SG C		
	8,297	86	Weighted Avera	age		
	6,417		77.34% Perviou	is Area		
	1,880		22.66% Impervi	ous Ar	ea	
	715		38.03% Unconnected			
Тс	Length	Slop	e Velocity Ca	pacity	Description	
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)		
5.0					Direct Entry,	

Subcatchment DA-2: Boat Launch



Summary for Reach R1: Swale



Summary for Pond P1: BIO 1

Inflow Area =	= 0.128	8 ac, 75.23% I	mpervious,	Inflow Depth >	2.09" for	2-YR event
Inflow =	0.33 0	cfs @ 12.07 h	irs, Volume	= 0.022	af	
Outflow =	0.33 0	cfs @ 12.08 h	irs, Volume	= 0.021	af, Atten= ()%, Lag= 0.5 min
Discarded =	0.00 0	cfs @ 12.08 h	irs, Volume	= 0.002	af	
Primary =	0.31 0	cfs @ 12.08 h	irs, Volume	= 0.019	af	
Secondary =	0.01 0	cfs @ 12.08 h	irs, Volume	= 0.000	af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 512.81' @ 12.08 hrs Surf.Area= 151 sf Storage= 58 cf

Plug-Flow detention time= 32.1 min calculated for 0.021 af (95% of inflow) Center-of-Mass det. time= 13.3 min (780.6 - 767.3)

Volume	Invert	Avail.Stor	age Storage	Description	
#1	512.25'	14	1 cf Custon	n Stage Data (P	rismatic)Listed below (Recalc)
Elevatio	on Su	rf.Area (sq-ft)	Inc.Store	Cum.Store	
512.2 512.7 513.0 513.2	25 75 00 25	60 135 200 201	0 49 42 50	0 49 91 141	
Device	Routing	Invert	Outlet Device	s	
#1	Primary	510.50'	4.0" Round L= 82.0' CM Inlet / Outlet I n= 0.013 Co	Culvert IP, projecting, nc Invert= 510.50' / rrugated PE, sm	o headwall, Ke= 0.900 508.75' S= 0.0213 '/' Cc= 0.900 ooth interior. Flow Area= 0.09 sf
#2	Device 1	512.75'	24.0" Horiz.	Orifice/Grate	C= 0.600 ads
#3	Secondary	512.80'	3.0' long x 0 Head (feet) (.5' breadth Bro).20 0.40 0.60	ad-Crested Rectangular Weir 0.80 1.00 08 3.30 3.32
#4	Discarded	512.25'	1.210 in/hr E Excluded Sur	xfiltration over face area = 60 s	Surface area above 512.25'

Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=512.81' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.30 cfs @ 12.08 hrs HW=512.81' (Free Discharge) -1=Culvert (Passes 0.30 cfs of 0.37 cfs potential flow) -2=Orifice/Grate (Weir Controls 0.30 cfs @ 0.80 fps)

Secondary OutFlow Max=0.01 cfs @ 12.08 hrs HW=512.81' (Free Discharge) —3=Broad-Crested Rectangular Weir (Weir Controls 0.01 cfs @ 0.29 fps)



Pond P1: BIO 1

Summary for Pond P2: BIO 2

Inflow Area =	0.319 ac,	43.81% Impervious	, Inflow Depth >	1.68" for	⁻ 2-YR event
Inflow =	0.70 cfs @	12.08 hrs, Volum	e= 0.045 :	af	
Outflow =	0.69 cfs @	12.10 hrs, Volum 1	e= 0.037 :	af, Atten=	2%, Lag= 1.4 min
Discarded =	0.01 cfs @	12.10 hrs, Volum 1	e= 0.006 a	af	
Primary =	0.19 cfs @	🧿 12.10 hrs, Volum	e= 0.014 a	af	
Secondary =	0.49 cfs @	12.10 hrs, Volum	e= 0.017 :	af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 507.92' @ 12.10 hrs Surf.Area= 611 sf Storage= 424 cf

Plug-Flow detention time= 72.3 min calculated for 0.037 af (83% of inflow) Center-of-Mass det. time= 28.0 min (809.8 - 781.8)

Volume	Inve	ert Avail.Sto	orage	age Storage Description				
#1	507.0	0' 6	25 cf	Custon	n Stage Data (Pi	rismatic)Listed below (Recalc)		
Elevatio	on	Surf.Area	Inc	.Store	Cum.Store			
(tee	et)	(sq-π)	(CUDIO	c-teet)	(CUDIC-TEET)			
507.0	00	315		0	0			
507.5	50	435		188	188			
507.7	75	610		131	318			
508.0	00	611		153	471			
508.2	25	625		155	625			
Device	Routing	Invert	Outle	et Device	es			
#1	Primary	507.75'	24.0	" Vert. C	rifice/Grate C=	= 0.600		
	2		Limit	ed to we	ir flow at low hea	ads		
#2	Seconda	ry 507.80'	4.0'	long x 0	.5' breadth Broa	ad-Crested Rectangular Weir		
		•	Head	d (feet) (0.20 0.40 0.60	0.80 1.00		
			Coef	f. (Englis	h) 2.80 2.92 3.	08 3.30 3.32		
#3	Discarde	d 507.00'	1.21	0 in/hr E	xfiltration over	Surface area above 507.00'		
			Excl	uded Su	face area = 315	sf		

Discarded OutFlow Max=0.01 cfs @ 12.10 hrs HW=507.92' (Free Discharge) **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.19 cfs @ 12.10 hrs HW=507.92' (Free Discharge) —1=Orifice/Grate (Orifice Controls 0.19 cfs @ 1.42 fps)

Secondary OutFlow Max=0.48 cfs @ 12.10 hrs HW=507.92' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 0.48 cfs @ 0.98 fps)



Pond P2: BIO 2

Summary for Pond SP1: Moultonborough Bay

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

Inflow Area	a =	0.319 ac, 4	13.81% Imp	ervious,	Inflow De	epth > 1	.17"	for 2-Y	R event	
Inflow	=	0.68 cfs @	12.10 hrs,	Volume	=	0.031 a	f			
Primary	=	0.68 cfs @	12.10 hrs,	Volume	=	0.031 a	f, Atte	en= 0%,	Lag= 0.0	min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Moultonborough Bay

19058 1-01A PR	Type II	II 24-hr 10-YR Rainfall=4.56"
Prepared by {enter your company nam	e here}	Printed 8/6/2020
HydroCAD® 10.10-4a s/n 01445 © 2020 HydroCAD® 10.10-4a s/n 01465 © 2020 HydroCAD® 10.10-4a s/n 01465 © 2020 HydroCAD® 10.10-4a s/n 01445 © 2020 HydroCAD® 10.10-4a s/n 01450 HydroCAD® 10.10-4a s/n 014500 HydroCAD® 10.10-4a s/n 01450 HydroC	droCAD Software Solutions LLC	Page 16
Time span=5. Runoff by SCS T Reach routing by Stor-Ind+	00-20.00 hrs, dt=0.05 hrs, 301 pc R-20 method, UH=SCS, Weight Trans method - Pond routing by	oints ed-CN ^y Stor-Ind method
Subcatchment DA-1: Access Drive	Runoff Area=5,584 sf 75.23% Tc=5.0 min	6 Impervious Runoff Depth>3.46" CN=92 Runoff=0.53 cfs 0.037 af
SubcatchmentDA-2: Boat Launch	Runoff Area=8,297 sf 22.66% Tc=5.0 min	6 Impervious Runoff Depth>2.88" CN=86 Runoff=0.68 cfs 0.046 af
Reach R1: Swale n=0.030	Avg. Flow Depth=0.07' Max Vel= _=45.0' S=0.0667 '/' Capacity=10.	1.64 fps Inflow=0.14 cfs 0.001 af .07 cfs Outflow=0.13 cfs 0.001 af
Pond P1: BIO 1	Peak Elev=512.87' Storage	ge=66 cf Inflow=0.53 cfs 0.037 af
Discarded=0.00 cfs 0.002 af Primary=0.38 cf	s 0.032 af Secondary=0.14 cfs 0.	, 001 af Outflow=0.52 cfs 0.036 af
Pond P2: BIO 2	Peak Elev=507.98' Storage	≥=456 cf Inflow=1.17 cfs 0.079 af
Discarded=0.01 cfs 0.007 af Primary=0.32 cf	s 0.026 af Secondary=0.83 cfs 0.	039 af Outflow=1.15 cfs 0.071 af
Pond SP1: Moultonborough Bay		Inflow=1.15 cfs 0.065 af Primary=1.15 cfs 0.065 af
Total Runoff Area = 0.319	ac Runoff Volume = 0.083 af	Average Runoff Depth = 3.11

Total Runoff Area = 0.319 ac Runoff Volume = 0.083 af Average Runoff Depth = 3.11" 56.19% Pervious = 0.179 ac 43.81% Impervious = 0.140 ac

Summary for Subcatchment DA-1: Access Drive

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.53 cfs @ 12.07 hrs, Volume= 0.037 af, Depth> 3.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-YR Rainfall=4.56"

A	rea (sf)	CN	Description					
	3,644	98	Paved parki	ng, HSG D				
	491	98	Roofs, HSG	D				
	0	70	Woods, Goo	d, HSG C				
	1,383	74	>75% Grass	cover, Go	od, HSG C			
	0	80	>75% Grass	cover, Go	od, HSG D			
	0	96	Gravel surfa	ce, HSG C	;			
	66	98	Water Surfa	ce, HSG C				
	5,584	92	Weighted Av	/erage				
	1,383		24.77% Per	vious Area				
	4,201		75.23% Imp	75.23% Impervious Area				
То	Longth	Slon	e Velocity	Capacity	Description			
IC (mine)	Lengin	Siop		Capacity	Description			
<u>(min)</u>	(leet)	(17/1	I) (II/SEC)	(CIS)				
5.0					Direct Entry,			

Subcatchment DA-1: Access Drive



Summary for Subcatchment DA-2: Boat Launch

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.68 cfs @ 12.07 hrs, Volume= 0.046 af, Depth> 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-YR Rainfall=4.56"

A	rea (sf)	CN	Description				
	855	98	Paved park	ing, HSG C	;		
	715	98	Unconnecte	ed roofs, HS	SG C		
	1,248	70	Woods, Go	od, HSG C			
	1,027	74	>75% Gras	s cover, Go	ood, HSG C		
	310	98	Water Surfa	ace, HSG C	,		
	4,142	89	Gravel road	ls, HSG C			
	8,297	86	Weighted A	Weighted Average			
	6,417		77.34% Pei	vious Area			
	1,880		22.66% Imp	pervious Are	ea		
	715		38.03% Unconnected				
Тс	Length	Slop	e Velocity	Capacity	Description		
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)			
5.0					Direct Entry,		

Subcatchment DA-2: Boat Launch



Summary for Reach R1: Swale



Summary for Pond P1: BIO 1

[82] Warning: Early inflow requires earlier time span

Inflow Area =	0.128 ac, 75.23% Impervious, Inflow	Depth > 3.46" for 10-YR event
Inflow =	0.53 cfs @ 12.07 hrs, Volume=	0.037 af
Outflow =	0.52 cfs @ 12.09 hrs, Volume=	0.036 af, Atten= 2%, Lag= 1.2 min
Discarded =	0.00 cfs @ 12.09 hrs, Volume=	0.002 af
Primary =	0.38 cfs @ 12.09 hrs, Volume=	0.032 af
Secondary =	0.14 cfs @12.09 hrs, Volume=	0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 512.87' @ 12.09 hrs Surf.Area= 165 sf Storage= 66 cf

Plug-Flow detention time= 22.9 min calculated for 0.036 af (97% of inflow) Center-of-Mass det. time= 10.5 min (766.5 - 756.0)

Volume	Invert	Avail.Stor	rage	Storage [Description		
#1	512.25'	14	l1 cf	Custom	Stage Data (P	rismatic)Listed below (Recalc)	
Elevatio (fee	n S t)	urf.Area (sq-ft)	Inc. (cubic	.Store c-feet)	Cum.Store (cubic-feet)		
512.2 512.7 513.0	5 5 0	60 135 200		0 49 42	0 49 91		
513.2	5	201		50	141		
Device	Routing	Invert	Outle	et Devices			
#1	Primary	510.50'	4.0 " L= 82 Inlet n= 0.	Round C 2.0' CMP / Outlet In .013 Corr	u lvert 9, projecting, no vert= 510.50' / ugated PE. sm	headwall, Ke= 0.900 508.75' S= 0.0213 '/' Cc= 0.900 ooth interior. Flow Area= 0.09 sf	
#2	Device 1	512.75'	24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads				
#3	Secondary	512.80'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32				
#4	Discarded	512.25'	1.21 Exclu	0 in/hr Ex	filtration over ace area = 60 s	Surface area above 512.25' ^f	

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=512.86' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=512.86' (Free Discharge) 1=Culvert (Barrel Controls 0.38 cfs @ 4.32 fps) 2=Orifice/Grate (Passes 0.38 cfs of 0.77 cfs potential flow)

Secondary OutFlow Max=0.13 cfs @ 12.09 hrs HW=512.86' (Free Discharge) -3=Broad-Crested Rectangular Weir (Weir Controls 0.13 cfs @ 0.70 fps)



Pond P1: BIO 1

Summary for Pond P2: BIO 2

Inflow Area =	0.319 ac, 43.81% Impervious, Inflow	Depth > 2.98" for 10-YR event
Inflow =	1.17 cfs @ 12.09 hrs, Volume=	0.079 af
Outflow =	1.15 cfs @ 12.10 hrs, Volume=	0.071 af, Atten= 1%, Lag= 1.1 min
Discarded =	0.01 cfs @_ 12.10 hrs, Volume=	0.007 af
Primary =	0.32 cfs @_ 12.10 hrs, Volume=	0.026 af
Secondary =	0.83 cfs @ 12.10 hrs, Volume=	0.039 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 507.98' @ 12.10 hrs Surf.Area= 611 sf Storage= 456 cf

Plug-Flow detention time= 53.1 min calculated for 0.071 af (90% of inflow) Center-of-Mass det. time= 21.7 min (791.6 - 770.0)

Volume	Inve	ert Avail.Sto	orage	Storage	Description		
#1	507.0	0' 6	25 cf	Custom	n Stage Data (Pi	rismatic)Listed below (Recalc)	
Elevatio	on t	Surf.Area	Inc	.Store	Cum.Store		
(166	et)	(sq-tt)	(CUDIO	c-teet)	(CUDIC-TEET)		
507.0	00	315		0	0		
507.5	50	435		188	188		
507.7	75	610		131	318		
508.0	00	611		153	471		
508.2	25	625		155	625		
Device	Routing	Invert	Outle	et Device	S		
#1	Primary	507.75'	24.0	" Vert. O	rifice/Grate C=	= 0.600	
	,		Limit	ted to we	ir flow at low hea	ads	
#2	Seconda	ry 507.80'	4.0'	long x0	.5' breadth Broa	ad-Crested Rectangular Weir	
			Head	d (feet) (0.20 0.40 0.60	0.80 1.00	
			Coef. (English) 2.80 2.92 3.08 3.30 3.32				
#3	Discarde	d 507.00'	00' 1.210 in/hr Exfiltration over Surface area above 507.00'			Surface area above 507.00'	
			Exclu	uded Sur	face area = 315	sf	

Discarded OutFlow Max=0.01 cfs @ 12.10 hrs HW=507.97' (Free Discharge) **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.31 cfs @ 12.10 hrs HW=507.97' (Free Discharge) 1=Orifice/Grate (Orifice Controls 0.31 cfs @ 1.61 fps)

Secondary OutFlow Max=0.82 cfs @ 12.10 hrs HW=507.97' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 0.82 cfs @ 1.17 fps) Prepared by {enter your company name here} HydroCAD® 10.10-4a s/n 01445 © 2020 HydroCAD Software Solutions LLC Pond P2: BIO 2



Summary for Pond SP1: Moultonborough Bay

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

Inflow Are	a =	0.319 ac, 4	43.81% Imp	ervious,	Inflow De	epth > 2	.43" for	· 10-`	YR event	
Inflow	=	1.15 cfs @	12.10 hrs,	Volume	=	0.065 af				
Primary	=	1.15 cfs @	12.10 hrs,	Volume	=	0.065 af	, Atten=	0%,	Lag= 0.0 m	າin

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Moultonborough Bay

19058 1-01A PR	Type III 24-hr WQv Rainfall=1.21"
Prepared by {enter your company name here	Printed 8/6/2020
HydroCAD® 10.10-4a s/n 01445 © 2020 HydroCAD	Software Solutions LLC Page 25
Time span=5.00-20.0 Runoff by SCS TR-20 ו Reach routing by Stor-Ind+Trans	0 hrs, dt=0.05 hrs, 301 points nethod, UH=SCS, Weighted-CN nethod - Pond routing by Stor-Ind method
Subcatchment DA-1: Access Drive	unoff Area=5,584 sf 75.23% Impervious Runoff Depth>0.52" Tc=5.0 min CN=92 Runoff=0.08 cfs 0.006 af
Subcatchment DA-2: Boat Launch	unoff Area=8,297 sf 22.66% Impervious Runoff Depth>0.28" Tc=5.0 min CN=86 Runoff=0.06 cfs 0.004 af
Reach R1: Swale Avg. I n=0.030 L=45.0'	Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af S=0.0667 '/' Capacity=10.07 cfs Outflow=0.00 cfs 0.000 af
Pond P1: BIO 1 Discarded=0.00 cfs 0.001 af Primary=0.10 cfs 0.003	Peak Elev=512.78' Storage=53 cf Inflow=0.08 cfs 0.006 af af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.005 af
Pond P2: BIO 2 Discarded=0.01 cfs 0.003 af Primary=0.00 cfs 0.000	Peak Elev=507.59' Storage=230 cf Inflow=0.16 cfs 0.007 af af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.003 af
Pond SP1: Moultonborough Bay	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af

Total Runoff Area = 0.319 acRunoff Volume = 0.010 afAverage Runoff Depth = 0.38"56.19% Pervious = 0.179 ac43.81% Impervious = 0.140 ac

Summary for Subcatchment DA-1: Access Drive

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.08 cfs @ 12.08 hrs, Volume= 0.006 af, Depth> 0.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description							
	3,644	98	Paved parki	ng, HSG D)					
	491	98	Roofs, HSG	Ď						
	0	70	Woods, Goo	d, HSG C						
	1,383	74	>75% Grass	s cover, Go	ood, HSG C					
	0	80	>75% Grass	s cover, Go	ood, HSG D					
	0	96	Gravel surfa	ice, HSG C	C					
	66	98	Water Surfa	ce, HSG C						
	5,584	92	Weighted A	verage						
	1,383		24.77% Per	24.77% Pervious Area						
	4,201		75.23% Impervious Area							
_		<u>.</u>								
IC	Length	Slop	e Velocity	Capacity	Description					
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)						
5.0					Direct Entry,					

Subcatchment DA-1: Access Drive



Summary for Subcatchment DA-2: Boat Launch

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.06 cfs @ 12.09 hrs, Volume= 0.004 af, Depth> 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description						
	855	98	Paved park	ing, HSG C	;				
	715	98	Unconnecte	ed roofs, HS	SG C				
	1,248	70	Woods, Go	od, HSG C					
	1,027	74	>75% Gras	s cover, Go	ood, HSG C				
	310	98	Water Surfa	ace, HSG C	;				
	4,142	89	Gravel road	ls, HSG C					
	8,297	86	Weighted A	verage					
	6,417		77.34% Pervious Area						
	1,880		22.66% Impervious Area						
	715		38.03% Unconnected						
Тс	Length	Slop	e Velocity	Capacity	Description				
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)					
5.0					Direct Entry,				

Subcatchment DA-2: Boat Launch



Summary for Reach R1: Swale



Summary for Pond P1: BIO 1

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area =	0.128 ac, 75.23% Impervious, Inflow	Depth > 0.52" for WQv event
Inflow =	0.08 cfs @ 12.08 hrs, Volume=	0.006 af
Outflow =	0.10 cfs @_ 12.10 hrs, Volume=	0.005 af, Atten= 0%, Lag= 1.4 min
Discarded =	0.00 cfs @_ 12.10 hrs, Volume=	0.001 af
Primary =	0.10 cfs @ 12.10 hrs, Volume=	0.003 af
Secondary =	0.00 cfs $\overline{@}$ 5.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 512.78' @ 12.10 hrs Surf.Area= 142 sf Storage= 53 cf

Plug-Flow detention time= 81.6 min calculated for 0.004 af (81% of inflow) Center-of-Mass det. time= 30.2 min (829.8 - 799.6)

Volume	Invert	Avail.Stor	rage	Storage [Description		
#1	512.25'	14	11 cf	Custom	Stage Data (Pi	rismatic)Listed below (Recalc)	
Elevatio (fee	on Si et)	urf.Area (sq-ft)	Inc.s	Store -feet)	Cum.Store		
512.2 512.7 513.0 513.2	25 75 00 25	60 135 200 201		0 49 42 50	0 49 91 141		
Device #1	Routing Primary	Invert 510.50'	Outlet 4.0" L= 82 Inlet /	t Devices Round C 0' CMP Outlet In	ulvert , projecting, nc vert= 510.50' /	headwall, Ke= 0.900 508.75' S= 0.0213 '/' Cc= 0.900	
#2	Device 1	512.75'	n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 st 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads				
#3 #4	Secondary Discarded	512.80' 512.25'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32 1.210 in/hr Exfiltration over Surface area above 512.25' Excluded Surface area = 60 sf				

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=512.78' (Free Discharge) **4=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.09 cfs @ 12.10 hrs HW=512.78' (Free Discharge) 1=Culvert (Passes 0.09 cfs of 0.37 cfs potential flow) 2=Orifice/Grate (Weir Controls 0.09 cfs @ 0.54 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=512.25' (Free Discharge) -3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
Hydrograph InflowOutflow 0.10 cfs Inflow Area=0.128 ac Discarded Primary
Secondary 0.10 cfs Peak Elev=512.78' 0.105 0.1 Storage=53 cf 0.095 0.09 0.085 0.08 0.075 0.073 0.07 (\$) 0.065 0.055 0.055 0.045 0.045 0.04 0.035 0.03 0.025 0 0.02 0.015 0.00 cfs 0 6 Ż 8 ģ 10 15 16 17 18 19 20 11 12 13 14

Time (hours)

Pond P1: BIO 1

Summary for Pond P2: BIO 2

Inflow Area =	0.319 ac, 43.81% Impervious, Inflov	v Depth > 0.28" for WQv event
Inflow =	0.16 cfs @ 12.10 hrs, Volume=	0.007 af
Outflow =	0.01 cfs @ 15.72 hrs, Volume=	0.003 af, Atten= 97%, Lag= 217.0 min
Discarded =	0.01 cfs @ 15.72 hrs, Volume=	0.003 af
Primary =	0.00 cfs @ 5.00 hrs, Volume=	0.000 af
Secondary =	0.00 cfs @ 5.00 hrs, Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 507.59' @ 15.72 hrs Surf.Area= 499 sf Storage= 230 cf

Plug-Flow detention time= 244.0 min calculated for 0.003 af (39% of inflow) Center-of-Mass det. time= 165.5 min (971.8 - 806.3)

Volume	Inve	ert Avail.Sto	orage	Storage	e Description	
#1	507.0	0' 6	25 cf	Custon	n Stage Data (Pi	rismatic)Listed below (Recalc)
Elevatio	on	Surf.Area	Inc	.Store	Cum.Store	
(166	əl)	(sq-it)	(cubic	c-leet)	(cubic-leet)	
507.0	00	315		0	0	
507.5	50	435		188	188	
507.7	75	610		131	318	
508.0	00	611		153	471	
508.2	25	625		155	625	
Device	Routing	Invert	Outle	et Device	es	
#1	Primary	507.75'	24.0	" Vert. C	Drifice/Grate C=	= 0.600
	,		Limit	ed to we	eir flow at low hea	ads
#2	Seconda	rv 507.80'	4.0'	lona x 0).5' breadth Broa	ad-Crested Rectangular Weir
		,	Head	d (feet) (0.20 0.40 0.60	0.80 1.00
			Coef	Enalis	h) 2.80 2.92 3.	08 3.30 3.32
#3	Discarde	d 507.00'	1.21	0 in/hr E	xfiltration over	Surface area above 507.00'
			Exclu	uded Su	r_{ace} area = 315	sf
					••••	

Discarded OutFlow Max=0.01 cfs @ 15.72 hrs HW=507.59' (Free Discharge) **3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=507.00' (Free Discharge)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=507.00' (Free Discharge) 2=Broad-Crested Rectangular Weir (Controls 0.00 cfs) Pond P2: BIO 2



Summary for Pond SP1: Moultonborough Bay

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

Inflow Area	a =	0.319 ac, 43	.81% Impervious,	Inflow Depth = 0.0	0" for WQv event
Inflow	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 af	
Primary	=	0.00 cfs @	5.00 hrs, Volume	= 0.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Moultonborough Bay



Project Notes

Rainfall events imported from "19058 1-01A PR.hcp"

Event#	Event	Storm Type	Curve	Mode	Duration	B/B	Depth	AMC
	Name				(hours)		(inches)	
1	2-YR	Type III 24-hr		Default	24.00	1	3.06	2
2	10-YR	Type III 24-hr		Default	24.00	1	4.56	2
3	WQv	Type III 24-hr		Default	24.00	1	1.21	2

Rainfall Events Listing (selected events)

Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.028	74	>75% Grass cover, Good, HSG C (DA1B)
0.059	98	Paved parking, HSG D (DA1B)
0.021	72	Woods/grass comb., Good, HSG C (DA1B)
0.108	87	TOTAL AREA
0.021 0.108	72 87	Woods/grass comb., Good, HSG C (DA TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.000	HSG A	
0.000	HSG B	
0.049	HSG C	DA1B
0.059	HSG D	DA1B
0.000	Other	
0.108		TOTAL AREA

Ground Covers (all nodes)

HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
0.000	0.000	0.028	0.000	0.000	0.028	>75% Grass cover, Good	DA1B
0.000	0.000	0.000	0.059	0.000	0.059	Paved parking	DA1B
0.000	0.000	0.021	0.000	0.000	0.021	Woods/grass comb., Good	DA1B
0.000	0.000	0.049	0.059	0.000	0.108	TOTAL AREA	

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment DA1B: ROUTE 109

Runoff Area=4,700 sf 54.79% Impervious Runoff Depth>1.67" Tc=5.0 min CN=87 Runoff=0.23 cfs 0.015 af

Pond SP1: EXISTING CATCH BASIN

Inflow=0.23 cfs 0.015 af Primary=0.23 cfs 0.015 af

Total Runoff Area = 0.108 acRunoff Volume = 0.015 afAverage Runoff Depth = 1.67"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.015 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-YR Rainfall=3.06"

A	rea (sf)	CN	Description						
	2,575	98	Paved park	ing, HSG D	D				
	905	72	Woods/gras	ss comb., G	Good, HSG C				
	1,220	74	>75% Gras	s cover, Go	ood, HSG C				
	4,700	87	Weighted A	Weighted Average					
	2,125		45.21% Pe	rvious Area	a				
	2,575		54.79% Imp	pervious Ar	rea				
Тс	Length	Slop	e Velocity	Capacity	Description				
(min)	(feet)	(ft/ft	t) (ft/sec) (cfs)						
5.0					Direct Entry,				

Subcatchment DA1B: ROUTE 109



Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	ı =	0.108 ac, 5	54.79% Imp	ervious,	Inflow De	epth > 1	.67" for	2-YR ev	ent
Inflow	=	0.23 cfs @	12.08 hrs,	Volume	=	0.015 af			
Primary	=	0.23 cfs @	12.08 hrs,	Volume	=	0.015 af	, Atten= (0%, Lag	= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentDA1B: ROUTE 109

Runoff Area=4,700 sf 54.79% Impervious Runoff Depth>2.97" Tc=5.0 min CN=87 Runoff=0.40 cfs 0.027 af

Pond SP1: EXISTING CATCH BASIN

Inflow=0.40 cfs 0.027 af Primary=0.40 cfs 0.027 af

Total Runoff Area = 0.108 acRunoff Volume = 0.027 afAverage Runoff Depth = 2.97"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.027 af, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-YR Rainfall=4.56"

A	rea (sf)	CN	Description						
	2,575	98	Paved park	ing, HSG D	D				
	905	72	Woods/gras	ss comb., G	Good, HSG C				
	1,220	74	>75% Gras	s cover, Go	lood, HSG C				
	4,700	87	Weighted A	Weighted Average					
	2,125		45.21% Pervious Area						
	2,575		54.79% Im	pervious Ar	rea				
Тс	Length	Slop	e Velocity	Capacity	Description				
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)					
5.0					Direct Entry,				

Subcatchment DA1B: ROUTE 109



Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	a =	0.108 ac, 5	54.79% Imp	ervious,	Inflow Dep	oth > 2.	.97" for	10-YR ev	/ent
Inflow	=	0.40 cfs @	12.07 hrs,	Volume	= (0.027 af			
Primary	=	0.40 cfs @	12.07 hrs,	Volume	= (0.027 af,	, Atten= 0)%, Lag=	0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentDA1B: ROUTE 109 Runoff Area=4,700 s

Runoff Area=4,700 sf 54.79% Impervious Runoff Depth>0.31" Tc=5.0 min CN=87 Runoff=0.04 cfs 0.003 af

Pond SP1: EXISTING CATCH BASIN

Inflow=0.04 cfs 0.003 af Primary=0.04 cfs 0.003 af

Total Runoff Area = 0.108 acRunoff Volume = 0.003 afAverage Runoff Depth = 0.31"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description						
	2,575	98	Paved park	ing, HSG D	D				
	905	72	Woods/gras	ss comb., G	Good, HSG C				
	1,220	74	>75% Gras	s cover, Go	ood, HSG C				
	4,700	87	Weighted A	Weighted Average					
	2,125		45.21% Pervious Area						
	2,575		54.79% Imp	pervious Ar	rea				
_									
Тс	Length	Slop	e Velocity	Capacity	Description				
<u>(min)</u>	(feet)	(ft/f	:) (ft/sec)	(cfs)					
5.0					Direct Entry,				

Subcatchment DA1B: ROUTE 109



Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	a =	0.108 ac, 5	54.79% Imp	ervious,	Inflow De	epth > C).31" fo	or WG	v event	
Inflow	=	0.04 cfs @	12.09 hrs,	Volume	=	0.003 a	f			
Primary	=	0.04 cfs @	12.09 hrs,	Volume	=	0.003 a	f, Atten=	= 0%,	Lag= 0.0) min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN



Project Notes

Rainfall events imported from "19058 1-01A PR.hcp"

Event#	Event Storm Type		Curve	Mode	Duration B/B		Depth	AMC
	Name				(hours)		(inches)	
1	2-YR	Type III 24-hr		Default	24.00	1	3.06	2
2	10-YR	Type III 24-hr		Default	24.00	1	4.56	2
3	Half WQv	Type III 24-hr		Default	24.00	1	0.60	2
4	WQv	Type III 24-hr		Default	24.00	1	1.21	2

Rainfall Events Listing (selected events)

Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.028	74	>75% Grass cover, Good, HSG C (DA1B)
0.059	98	Paved parking, HSG D (DA1B)
0.021	72	Woods/grass comb., Good, HSG C (DA1B)
0.108	87	TOTAL AREA
0.021 0.108	72 87	Woods/grass comb., Good, HSG C (DA TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.000	HSG A	
0.000	HSG B	
0.049	HSG C	DA1B
0.059	HSG D	DA1B
0.000	Other	
0.108		TOTAL AREA

Ground Covers (all nodes)

HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
 0.000	0.000	0.028	0.000	0.000	0.028	>75% Grass cover, Good	DA1B
0.000	0.000	0.000	0.059	0.000	0.059	Paved parking	DA1B
0.000	0.000	0.021	0.000	0.000	0.021	Woods/grass comb., Good	DA1B
0.000	0.000	0.049	0.059	0.000	0.108	TOTAL AREA	

19058 1-01B PR	here}	Type III 24-hr 2-YR Rainfall=3.0)6″							
Prepared by {enter your company name		Printed 8/6/202	20							
HydroCAD® 10.10-4a s/n 01445 © 2020 Hydro		ons LLC Page	<u>e 7</u>							
Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method										
Subcatchment DA1B: ROUTE 109	Runoff Area=4,700	0 sf 54.79% Impervious Runoff Depth>1.6	37"							
	T	Fc=5.0 min CN=87 Runoff=0.23 cfs 0.015	af							
Pond RG1: TOP CELL	Peak Elev=51	7.83' Storage=17 cf Inflow=0.23 cfs 0.015	af							
Discarded=0.00 c	fs 0.000 af Primary=	=0.23 cfs 0.014 af Outflow=0.23 cfs 0.015	af							
Pond RG2: BOTTOM CELL	Peak Elev=516	6.85' Storage=31 cf Inflow=0.23 cfs 0.014	af							
Discarded=0.00 c	fs 0.001 af Primary=	=0.23 cfs 0.013 af Outflow=0.23 cfs 0.014	af							
Pond SP1: EXISTING CATCH BASIN		Inflow=0.23 cfs 0.013 Primary=0.23 cfs 0.013	af af							

Total Runoff Area = 0.108 acRunoff Volume = 0.015 afAverage Runoff Depth = 1.67"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.23 cfs @ 12.08 hrs, Volume= 0.015 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 2-YR Rainfall=3.06"

A	rea (sf)	CN	Description								
	2,575	98	Paved park	Paved parking, HSG D							
	905	72	Woods/grass comb., Good, HSG C								
	1,220	74	>75% Gras	75% Grass cover, Good, HSG C							
	4,700 87 Weighted Average										
	2,125		45.21% Pervious Area								
	2,575		54.79% Imp	pervious Ar	rea						
Тс	Length	Slop	e Velocity	Capacity	Description						
(min)	(feet)	(ft/ft	:) (ft/sec)	(cfs)							
5.0					Direct Entry,						

Subcatchment DA1B: ROUTE 109



Summary for Pond RG1: TOP CELL

Inflow Area	=	0.108 ac, 5	4.79% Impe	ervious, Inflow De	epth > 1.6	7" for 2-Y	R event
Inflow	=	0.23 cfs @	12.08 hrs,	Volume=	0.015 af		
Outflow	=	0.23 cfs @	12.08 hrs,	Volume=	0.015 af,	Atten= 0%,	Lag= 0.5 min
Discarded	=	0.00 cfs @	12.08 hrs,	Volume=	0.000 af		
Primary	=	0.23 cfs @	12.08 hrs,	Volume=	0.014 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 517.83' @ 12.08 hrs Surf.Area= 80 sf Storage= 17 cf

Plug-Flow detention time= 12.2 min calculated for 0.015 af (98% of inflow) Center-of-Mass det. time= 4.9 min (790.3 - 785.4)

Volume	Inver	t Avail.Sto	rage Sto	Storage Description							
#1	517.50	' 4	46 cf Cu	stom	Stage Data (P	rismatic)Listed below (Recalc)					
Elevatio	n S	Surf.Area	Inc.Sto	re	Cum.Store						
(tee	t)	(sq-ft)	(cubic-fe	et)	(cubic-feet)						
517.5	0	30		0	0						
517.7	5	65		12	12						
518.0	0	115		23	34						
518.1	0	120		12	46						
Device	Routing	Invert	Outlet D	evices							
#1	Discarded	517.50'	0.600 in Exclude	/ hr Ex t d Surfa	filtration over ace area = 30 s	sf surface area above 517.50'					
#2	Primary	517.75'	4.0' long Head (fe 2.50 3.0 Coef. (E 3.30 3.3	3 x 1.0 eet) 0.2 00 nglish) 31 3.32)' breadth Bro 20 0.40 0.60) 2.69 2.72 2. 2	Dad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .75 2.85 2.98 3.08 3.20 3.28 3.31					

Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=517.82' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.22 cfs @ 12.08 hrs HW=517.82' (Free Discharge) **2=Broad-Crested Rectangular Weir** (Weir Controls 0.22 cfs @ 0.74 fps)



Pond RG1: TOP CELL

Summary for Pond RG2: BOTTOM CELL

Inflow Area	ı =	0.108 ac, 5	4.79% Impe	ervious, Ir	Inflow Depth	<mark>ו> 1</mark> .5	9" for 2-Y	R event
Inflow	=	0.23 cfs @	12.08 hrs,	Volume=	0.0	014 af		
Outflow	=	0.23 cfs @	12.10 hrs,	Volume=	0.0	014 af,	Atten= 0%,	Lag= 0.7 min
Discarded	=	0.00 cfs @	12.10 hrs,	Volume=	0.0	001 af		•
Primary	=	0.23 cfs @	12.10 hrs,	Volume=	0.0	013 af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 516.85' @ 12.10 hrs Surf.Area= 122 sf Storage= 31 cf

Plug-Flow detention time= 18.1 min calculated for 0.014 af (97% of inflow) Center-of-Mass det. time= 6.4 min (794.2 - 787.8)

Volume	Invert	Avail.Sto	rage	Storage Description					
#1	516.50'		65 cf	Custom S	tage Data (P	rismatic)Listed below (Recalc)			
Elevatio	on Si	urf.Area	Inc (cubic	.Store	Cum.Store				
	50	<u>(3q-1t)</u> 40	(cubit	0					
516	75	40		19	0 19				
517.0	20	140		31	50				
517.	10	150		15	65				
Device	Routing	Invert	Outle	et Devices					
#1	Discarded	516.50'	0.60	0 in/hr Exfi	Itration over	Surface area above 516.50'			
#2	Primary	516.75'	Exclu 2.0' I Head 2.50 Coef	uded Surfac Iong x 2.0' d (feet) 0.20 3.00 3.50 f. (English)	e area = 40 s breadth Bro 0 0.40 0.60 2.54 2.61 2	st ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 .61 2.60 2.66 2.70 2.77 2.89 2.88			
#3	Primary	516.76'	2.85 24.0 ' Limit	3.07 3.20 " Vert. Orifi ed to weir f	3.32 i ce/Grate C low at low he	= 0.600 ads			
Discord	incorrected OutFlow May-0.00 of @ 10.10 hrs. INV-516.051 (Free Discharge)								

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=516.85' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.22 cfs @ 12.10 hrs HW=516.85' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 0.17 cfs @ 0.81 fps) 3=Orifice/Grate (Orifice Controls 0.05 cfs @ 1.04 fps)



Pond RG2: BOTTOM CELL

Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	a =	0.108 ac, 5	54.79% Impe	ervious,	Inflow De	pth > 1	.45" for	⁻ 2-Y	R event	
Inflow	=	0.23 cfs @	12.10 hrs,	Volume	=	0.013 af				
Primary	=	0.23 cfs @	12.10 hrs,	Volume	=	0.013 af	, Atten=	0%,	Lag= 0.0) min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN

19058 1-01B PR Prepared by {enter your company name h HydroCAD® 10.10-4a s/n 01445 © 2020 HydroC	ere} CAD Software Solutions	Type III 24-hr	10-YR Rainfal Printed 8/ F	l=4.56" /6/2020 Page 14				
Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method								
Subcatchment DA1B: ROUTE 109	Runoff Area=4,700 st	54.79% Impervi	ious Runoff Dept	h>2.97"				
	Tc=	5.0 min CN=87	Runoff=0.40 cfs	0.027 af				
Pond RG1: TOP CELL	Peak Elev=517.8	6' Storage=20 cf	Inflow=0.40 cfs	0.027 af				
Discarded=0.00 cfs	0.001 af Primary=0.3	89 cfs 0.026 af 0	Outflow=0.39 cfs(0.026 af				
Pond RG2: BOTTOM CELL	Peak Elev=516.8	9' Storage=36 cf	Inflow=0.39 cfs	0.026 af				
Discarded=0.00 cfs	0.001 af Primary=0.3	89 cfs 0.024 af (Outflow=0.40 cfs(0.025 af				
Pond SP1: EXISTING CATCH BASIN		F	Inflow=0.39 cfs Primary=0.39 cfs	0.024 af 0.024 af				

Total Runoff Area = 0.108 acRunoff Volume = 0.027 afAverage Runoff Depth = 2.97"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.40 cfs @ 12.07 hrs, Volume= 0.027 af, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr 10-YR Rainfall=4.56"

A	rea (sf)	CN	Description						
	2,575	98	Paved parking, HSG D						
	905	72	Woods/grass comb., Good, HSG C						
	1,220	74	>75% Grass cover, Good, HSG C						
	4,700	87	Weighted Average						
	2,125		45.21% Pervious Area						
	2,575		54.79% Impervious Area						
_									
Тс	Length	Slop	e Velocity	Capacity	Description				
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)					
5.0					Direct Entry,				

Subcatchment DA1B: ROUTE 109



Summary for Pond RG1: TOP CELL

Inflow Area	ı =	0.108 ac, 5	4.79% Impe	ervious,	Inflow	Depth >	2.97	" for 10-	YR event	
Inflow	=	0.40 cfs @	12.07 hrs,	Volume	=	0.027	af			
Outflow	=	0.39 cfs @	12.08 hrs,	Volume	=	0.026	af, A	tten= 0%,	Lag= 0.5 n	nin
Discarded	=	0.00 cfs @	12.08 hrs,	Volume	=	0.001	af			
Primary	=	0.39 cfs @	12.08 hrs,	Volume	=	0.026	af			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 517.86' @ 12.08 hrs Surf.Area= 87 sf Storage= 20 cf

Plug-Flow detention time= 8.0 min calculated for 0.026 af (99% of inflow) Center-of-Mass det. time= 3.8 min (775.7 - 771.9)

Volume	Inver	t Avail.Sto	brage Storage Description					
#1	517.50	'	46 cf	Custom	n Stage Data (Pi	rismatic)Listed below (Recalc)		
Elevation Surf.Area		Surf.Area	Inc.	Store	Cum.Store			
(tee	t)	(sq-tt)	(Cubic	c-reet)	(CUDIC-TEET)			
517.5	60	30		0	0			
517.7	5	65		12	12			
518.0	0	115		23	34			
518.1	0	120		12	46			
Device	Routing	Invert	Outle	et Device	S			
#1	Discarded	517.50'	0.600 in/hr Exfiltration over Surface area above 517.50' Excluded Surface area = 30 sf					
#2	Primary	517.75'	4.0' long x 1.0' 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 Coef. (English) 2.69 2.72 2.75 2.85 2.98 3.08 3.20 3.28 3.31 3.30 3.31 3.32					

Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=517.86' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.38 cfs @ 12.08 hrs HW=517.86' (Free Discharge) **2=Broad-Crested Rectangular Weir** (Weir Controls 0.38 cfs @ 0.88 fps)



Pond RG1: TOP CELL
Summary for Pond RG2: BOTTOM CELL

Inflow Area	=	0.108 ac, 5	4.79% Imp	ervious, Inflov	w Depth > 2	.88" for	10-YR event
Inflow	=	0.39 cfs @	12.08 hrs,	Volume=	0.026 af	:	
Outflow	=	0.40 cfs @	12.09 hrs,	Volume=	0.025 af	, Atten= 0	%, Lag= 0.6 min
Discarded	=	0.00 cfs @	12.09 hrs,	Volume=	0.001 af	:	
Primary	=	0.39 cfs @	12.09 hrs,	Volume=	0.024 af	:	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 516.89' @ 12.09 hrs Surf.Area= 127 sf Storage= 36 cf

Plug-Flow detention time= 12.1 min calculated for 0.025 af (98% of inflow) Center-of-Mass det. time= 5.2 min (780.0 - 774.8)

Volume	Invert	Avail.Sto	orage	Storage D	escription	
#1	516.50'		65 cf	Custom S	tage Data (Pr	r ismatic) Listed below (Recalc)
Elevatio	on S	urf.Area	Inc.	Store	Cum.Store	
516	50	<u>(3q-11)</u> 40		0	0	
516.7	75	110		19	19	
517.0	00	140		31	50	
517.1	10	150		15	65	
Device	Routing	Invert	Outle	et Devices		
#1	Discarded	516.50'	0.60 Exclu) in/hr Exfi uded Surfac	Itration over ce area = 40 s	Surface area above 516.50' f
#2	Primary	516.75'	2.0' I Head 2.50 Coef 2.85	ong x 2.0' I (feet) 0.20 3.00 3.50 . (English) 3.07 3.20	breadth Broa 0 0.40 0.60 2.54 2.61 2.0 3.32	ad-Crested Rectangular Weir0.801.001.201.401.601.802.00612.602.662.702.772.892.88
#3	Primary	516.76'	24.0' Limit	' Vert. Orif ed to weir f	ice/Grate C= low at low hea	= 0.600 ads
Discord	ad OutFlow	May-0.00 of	- @ 1		N-516 901 /E	Tran Dinaharga)

Discarded OutFlow Max=0.00 cfs @ 12.09 hrs HW=516.89' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.38 cfs @ 12.09 hrs HW=516.89' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 0.27 cfs @ 0.96 fps) 3=Orifice/Grate (Orifice Controls 0.11 cfs @ 1.24 fps)



Pond RG2: BOTTOM CELL

Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	ı =	0.108 ac, 5	54.79% Impe	ervious,	Inflow De	epth > 2.	72" for	10-Y	R event	
Inflow	=	0.39 cfs @	12.09 hrs,	Volume	=	0.024 af				
Primary	=	0.39 cfs @	12.09 hrs,	Volume	=	0.024 af	, Atten=	0%, L	.ag= 0.0 i	min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN

19058 1-01B PR	Type III 24-hr Half WQv Rainfall=0.60"					
Prepared by {enter your company name	here} Printed 8/6/2020					
HydroCAD® 10.10-4a s/n 01445 © 2020 Hydro	CAD Software Solutions LLC Page 21					
Time span=5.00 Runoff by SCS TR Reach routing by Stor-Ind+Tra	-20.00 hrs, dt=0.05 hrs, 301 points -20 method, UH=SCS, Weighted-CN ans method - Pond routing by Stor-Ind method					
Subcatchment DA1B: ROUTE 109	Runoff Area=4,700 sf 54.79% Impervious Runoff Depth>0.04" Tc=5.0 min CN=87 Runoff=0.00 cfs 0.000 af					
Pond RG1: TOP CELL Discarded=0.00 c	Peak Elev=517.69' Storage=8 cf Inflow=0.00 cfs 0.000 af fs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af					
Pond RG2: BOTTOM CELL Discarded=0.00 c	Peak Elev=516.50' Storage=0 cf Inflow=0.00 cfs 0.000 af fs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af					
Pond SP1: EXISTING CATCH BASIN	Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af					

Total Runoff Area = 0.108 acRunoff Volume = 0.000 afAverage Runoff Depth = 0.04"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.00 cfs @ 12.30 hrs, Volume= 0.000 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr Half WQv Rainfall=0.60"

A	rea (sf)	CN	Description					
	2,575	98	Paved park	ing, HSG D				
	905	72	Woods/gras	ss comb., G	lood, HSG C			
	1,220	74	>75% Gras	s cover, Go	od, HSG C			
	4,700	87	Weighted A	Veighted Average				
	2,125		45.21% Pe	rvious Area				
	2,575		54.79% lmp	pervious Ar	ea			
Та	l a sa aith	Clan	- Malaaitu	Consolty	Description			
IC	Lengin	Siop	e velocity	Capacity	Description			
(min)	(teet)	(ft/f	t) (tt/sec)	(cfs)				
5.0					Direct Entry,			

Subcatchment DA1B: ROUTE 109



Summary for Pond RG1: TOP CELL

Inflow Area	=	0.108 ac, 5	4.79% Imp	ervious,	Inflow	Depth >	0.04"	for	Half	WQv e	vent	
Inflow	=	0.00 cfs @	12.30 hrs,	Volume	=	0.000	af					
Outflow	=	0.00 cfs @	16.93 hrs,	Volume	=	0.000	af, At	ten= 8	84%,	Lag= 2	277.7	min
Discarded	=	0.00 cfs @	16.93 hrs,	Volume	=	0.000	af					
Primary	=	0.00 cfs @	5.00 hrs,	Volume	=	0.000	af					

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 517.69' @ 16.93 hrs Surf.Area= 57 sf Storage= 8 cf

Plug-Flow detention time= 204.3 min calculated for 0.000 af (55% of inflow) Center-of-Mass det. time= 103.0 min (985.2 - 882.2)

Volume	Inver	t Avail.Sto	rage	Storage	Description	
#1	517.50)'	46 cf	Custom	Stage Data (P	Prismatic)Listed below (Recalc)
Elevatio	n S	Surf.Area	Inc	Store	Cum.Store	
(teet	()	(sq-ft)	(cubic	c-feet)	(cubic-feet)	
517.5	0	30		0	0	
517.7	5	65		12	12	
518.0	0	115		23	34	
518.1	0	120		12	46	
Device	Routing	Invert	Outle	et Device:	S	
#1	Discarded	517.50'	0.60 Exclu) in/hr Ex uded Surf	xfiltration over face area = 30 s	r Surface area above 517.50' sf
#2	Primary	517.75'	4.0' I Head 2.50 Coef 3.30	ong x 1. d (feet) 0 3.00 . (English 3.31 3.3	0' breadth Bro 20 0.40 0.60 1) 2.69 2.72 2.	Dad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.75 2.85 2.98 3.08 3.20 3.28 3.31

Discarded OutFlow Max=0.00 cfs @ 16.93 hrs HW=517.69' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=517.50' (Free Discharge) **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)



Pond RG1: TOP CELL

Summary for Pond RG2: BOTTOM CELL

Inflow Area	ı =	0.108 ac, 54	.79% Impervious, In	flow Depth = 0.0	0" for Half WQv event
Inflow	=	0.00 cfs @	5.00 hrs, Volume=	0.000 af	
Outflow	=	0.00 cfs @	5.00 hrs, Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min
Discarded	=	0.00 cfs @	5.00 hrs, Volume=	0.000 af	
Primary	=	0.00 cfs @	5.00 hrs, Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 516.50' @ 5.00 hrs Surf.Area= 40 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow) Center-of-Mass det. time= (not calculated: no inflow)

Volume	Inver	t Avail.Sto	rage	Storage D	escription	
#1	516.50)' (65 cf	Custom S	Stage Data (P	rismatic)Listed below (Recalc)
Elevatio	on S	Surf.Area	Inc.	Store	Cum.Store	
	el)	<u>(sq-it)</u>	(Cubic			
516	5U 75	40 110		0 10	10	
517	00	140		31	50	
517.	10	150		15	65	
Device	Routing	Invert	Outle	et Devices		
#1	Discarded	516.50'	0.60	0 in/hr Exf	iltration over	Surface area above 516.50'
			Exclu	uded Surfa	ce area = 40 s	sf
#2	Primary	516.75'	2.0' I	ong x 2.0	' breadth Bro	ad-Crested Rectangular Weir
			Head	d (feet) 0.2	20 0.40 0.60	0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 Coof	3.00 3.50 (English)) 254 261 2	61 260 266 270 277 280 289
			2 85	. (⊏ngiisn) 3.07.3.20	2.04 2.01 2.) 3.32	.01 2.00 2.00 2.10 2.11 2.09 2.00
#3	Primarv	516.76'	24.0	" Vert. Ori	f ice/Grate C:	= 0.600
	, ,		Limit	ed to weir	flow at low hea	ads

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=516.50' (Free Discharge) **1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=516.50' (Free Discharge) -2=Broad-Crested Rectangular Weir (Controls 0.00 cfs) -3=Orifice/Grate (Controls 0.00 cfs)

19058 1-01B PR

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Pond RG2: BOTTOM CELL

Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	a =	0.108 ac, 54	.79% Imperviou	s, Inflow De	pth = 0.0	0" for Hal	f WQv event
Inflow	=	0.00 cfs @	5.00 hrs, Volur	ne=	0.000 af		
Primary	=	0.00 cfs @	5.00 hrs, Volur	ne=	0.000 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN

19058 1-01B PR Prepared by {enter your c HydroCAD® 10.10-4a s/n 014	ompany name here} 45 © 2020 HydroCAD Softv	vare Solutions I	Type III 24-hi	r WQ <i>v Rainfa</i> Printed 8	ll=1.21" 8/6/2020 Page <u>28</u>
Ru Reach routing	Time span=5.00-20.00 hrs inoff by SCS TR-20 metho g by Stor-Ind+Trans metho	, dt=0.05 hrs, d, UH=SCS, v d - Pond rou	301 points Weighted-CN iting by Stor-Ind	l method	
Subcatchment DA1B: ROU	ITE 109 Runoff	Area=4,700 sf Tc=5	54.79% Impervi .0 min CN=87	ous Runoff Dep Runoff=0.04 cfs	th>0.31" 0.003 af
Pond RG1: TOP CELL	Pea Discarded=0.00 cfs 0.000 a	k Elev=517.77 f Primary=0.04	' Storage=13 cf 4 cfs 0.002 af C	Inflow=0.04 cfs 0utflow=0.04 cfs	0.003 af 0.003 af
Pond RG2: BOTTOM CELL	Discarded=0.00 cfs 0.001 a	k Elev=516.78 f Primary=0.02	' Storage=22 cf 2 cfs 0.001 af C	Inflow=0.04 cfs 0utflow=0.02 cfs	0.002 af 0.002 af
Pond SP1: EXISTING CAT	CH BASIN		Ρ	Inflow=0.02 cfs rimary=0.02 cfs	0.001 af 0.001 af

Total Runoff Area = 0.108 acRunoff Volume = 0.003 afAverage Runoff Depth = 0.31"45.21% Pervious = 0.049 ac54.79% Impervious = 0.059 ac

Summary for Subcatchment DA1B: ROUTE 109

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description					
	2,575	98	Paved park	ing, HSG D)			
	905	72	Woods/gras	ss comb., G	Good, HSG C			
	1,220	74	>75% Gras	s cover, Go	ood, HSG C			
	4,700	87	Weighted A	Veighted Average				
	2,125		45.21% Pe	45.21% Pervious Area				
	2,575		54.79% Imp	pervious Ar	rea			
Тс	Length	Slop	e Velocity	Capacity	Description			
(min)	(feet)	(ft/f	t) (ft/sec)	(cfs)				
5.0					Direct Entry,			

Subcatchment DA1B: ROUTE 109



Summary for Pond RG1: TOP CELL

Inflow Area	ı =	0.108 ac, 5	4.79% Impe	ervious, Inflo	ow Depth >	0.31"	for WQ	v event
Inflow	=	0.04 cfs @	12.09 hrs,	Volume=	0.003	af		
Outflow	=	0.04 cfs @	12.08 hrs,	Volume=	0.003	af, Atte	en= 4%,	Lag= 0.0 min
Discarded	=	0.00 cfs @	12.08 hrs,	Volume=	0.000	af		
Primary	=	0.04 cfs @	12.08 hrs,	Volume=	0.002	af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 517.77' @ 12.08 hrs Surf.Area= 70 sf Storage= 13 cf

Plug-Flow detention time= 43.8 min calculated for 0.003 af (90% of inflow) Center-of-Mass det. time= 12.9 min (836.3 - 823.3)

Volume	Inve	rt Avail.Sto	orage	age Storage Description			
#1	517.50)'	46 cf	Custom	Stage Data (Pi	rismatic)Listed belo	w (Recalc)
Elevatio	Elevation Surf.Area		Inc.	Store	Cum.Store		
(tee	et)	(sq-ft)	(CUDIC	-feet)	(cubic-feet)		
517.5	50	30		0	0		
517.7	75	65		12	12		
518.0	00	115		23	34		
518.´	10	120		12	46		
Device	Routing	Invert	Outle	t Devices	;		
#1	Discardeo	517.50'	0.600 Exclu) in/hr Ex	filtration over	Surface area above	e 517.50'
#2	Primary	517.75'	4.0' I Head 2.50 Coef. 3.30	ong x 1. I (feet) 0. 3.00 . (English 3.31 3.3	0' breadth Broa 20 0.40 0.60) 2.69 2.72 2. 2	ad-Crested Rectan 0.80 1.00 1.20 1.4 75 2.85 2.98 3.08	gular Weir 10 1.60 1.80 2.00 3.20 3.28 3.31

Discarded OutFlow Max=0.00 cfs @ 12.08 hrs HW=517.77' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.04 cfs @ 12.08 hrs HW=517.77' (Free Discharge) **2=Broad-Crested Rectangular Weir** (Weir Controls 0.04 cfs @ 0.41 fps)





Pond RG1: TOP CELL

Summary for Pond RG2: BOTTOM CELL

Inflow Area	=	0.108 ac, 5	4.79% Impe	ervious, Inflow D) > Oepth).25" fo	r WQv	v event	
Inflow	=	0.04 cfs @	12.08 hrs,	Volume=	0.002 a	f			
Outflow	=	0.02 cfs @	12.26 hrs,	Volume=	0.002 a	f, Atten=	37%,	Lag= 10	.9 min
Discarded	=	0.00 cfs @	12.25 hrs,	Volume=	0.001 a	f			
Primary	=	0.02 cfs @	12.26 hrs,	Volume=	0.001 a	f			

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 516.78' @ 12.27 hrs Surf.Area= 113 sf Storage= 22 cf

Plug-Flow detention time= 76.9 min calculated for 0.002 af (83% of inflow) Center-of-Mass det. time= 32.9 min (851.3 - 818.4)

Volume	Invert	Avail.Sto	rage	Storage D	escription	
#1	516.50'		65 cf	Custom S	tage Data (Pi	rismatic)Listed below (Recalc)
Elevation Surf.Area		Inc.	Store	Cum.Store		
516.5	50 50 75	40 110		0	0	
517.0 517.0	00 10	140 150		31 15	50 65	
Device	Routing	Invert	Outle	et Devices		
#1	Discarded	516.50'	0.600 Exclu) in/hr Exfi uded Surfac	Itration over ce area = 40 s	Surface area above 516.50' ^{.f}
#2	Primary	516.75'	2.0' Head 2.50 Coef 2.85	ong x 2.0' d (feet) 0.20 3.00 3.50 . (English) 3.07 3.20	breadth Broa 0 0.40 0.60 2.54 2.61 2.	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 61 2.60 2.66 2.70 2.77 2.89 2.88
#3	Primary	516.76'	24.0' Limit	' Vert. Orif ed to weir f	i ce/Grate C= low at low hea	= 0.600 ads
Discord	ad OutFlow		a @ 11) 25 bra LIV	N-516 79' (E	

Discarded OutFlow Max=0.00 cfs @ 12.25 hrs HW=516.78' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.02 cfs @ 12.26 hrs HW=516.77' (Free Discharge) 2=Broad-Crested Rectangular Weir (Weir Controls 0.02 cfs @ 0.40 fps) 3=Orifice/Grate (Orifice Controls 0.00 cfs @ 0.41 fps)



Pond RG2: BOTTOM CELL

Summary for Pond SP1: EXISTING CATCH BASIN

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

Inflow Area	a =	0.108 ac, 5	54.79% Imp	ervious,	Inflow Dep	oth = C).13" fo	or WG	v event	
Inflow	=	0.02 cfs @	12.26 hrs,	Volume	= (0.001 a [·]	f			
Primary	=	0.02 cfs @	12.26 hrs,	Volume	= (0.001 a	f, Atten=	= 0%,	Lag= 0.0	min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: EXISTING CATCH BASIN



Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.002	74	>75% Grass cover, Good, HSG C (D-12B)
0.078	98	Paved parking, HSG D (D-12B)
0.121	98	Paved roads w/curbs & sewers, HSG D (D-12A)
0.125	30	Woods, Good, HSG A (D-12A)
0.078	77	Woods, Good, HSG D (D-12B)
0.403	73	TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.125	HSG A	D-12A
0.000	HSG B	
0.002	HSG C	D-12B
0.276	HSG D	D-12A, D-12B
0.000	Other	
0.403		TOTAL AREA

19058 1-12A EX

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			neuco,				
HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
0.000	0.000	0.002	0.000	0.000	0.002	>75% Grass cover, Good	D-12
							В
0.000	0.000	0.000	0.078	0.000	0.078	Paved parking	D-12
							В
0.000	0.000	0.000	0.121	0.000	0.121	Paved roads w/curbs & sewers	D-12
							А
0.125	0.000	0.000	0.078	0.000	0.202	Woods, Good	D-12
							А,
							D-12
							В

Ground Covers (all nodes)

0.12	5 0.000	0.002	0.276	0.000	0.403	TOTAL AREA

19058 1-12A EX Prepared by {enter your company name HydroCAD® 10.10-4a s/n 01445 © 2020 Hyd	e here} roCAD Software Solutions LL	Type III 24-hr WQv Rainfall=1.21" Printed 8/31/2020 C Page 5
Time span=5.0 Runoff by SCS T Reach routing by Stor-Ind+T	0-20.00 hrs, dt=0.05 hrs, 30 R-20 method, UH=SCS, Wo Trans method - Pond routin	01 points eighted-CN ng by Stor-Ind method
Subcatchment D-12A: South of Culvert	Runoff Area=10,700 sf 4 Tc=15.0	9.31% Impervious Runoff Depth>0.00" min CN=64 Runoff=0.00 cfs 0.000 af
Subcatchment D-12B: North of Culvert	Runoff Area=6,852 sf 4 Flow Length=282' Tc=26.8	9.36% Impervious Runoff Depth>0.31" min CN=87 Runoff=0.03 cfs 0.004 af
Pond SP1: Stream		Inflow=0.03 cfs 0.004 af Primary=0.03 cfs 0.004 af
Total Runoff Area = 0.403	ac Runoff Volume = 0.0 50.67% Pervious = 0.204	04 af Average Runoff Depth = 0.12" ac 49.33% Impervious = 0.199 ac

Summary for Subcatchment D-12A: South of Culvert

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description						
	5,276	98	Paved road	s w/curbs &	& sewers, HSG D				
	5,424	30	Woods, Go	Woods, Good, HSG A					
	10,700	64	Weighted A	Weighted Average					
	5,424		50.69% Per	50.69% Pervious Area					
	5,276		49.31% Impervious Area						
То	Longth	Slop	- Volocity	Conacity	Description				
	Lengin	Siope		Capacity	Description				
<u>(min)</u>	(teet)	(π/π) (IT/SEC)	(CTS)					
15.0					Direct Entry,				

Subcatchment D-12A: South of Culvert



Summary for Subcatchment D-12B: North of Culvert

Runoff = 0.03 cfs @ 12.42 hrs, Volume= 0.004 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description							
	3,382	77	Woods, Go	od, HSG D						
	3,382	98	Paved park	ing, HSG D)					
	88	74	>75% Ġras	s cover, Go	bod, HSG C					
	6,852	87	Weighted A	verage						
	3,470		50.64% Pervious Area							
	3,382		49.36% Imp	pervious Ar	ea					
Tc	Length	Slope	e Velocity	Capacity	Description					
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)						
22.3	50	0.0200	0.04		Sheet Flow,					
					Woods: Dense underbrush n= 0.800 P2= 2.96"					
4.5	232	0.0300	0.87		Shallow Concentrated Flow,					
					Woodland Kv= 5.0 fps					
26.8	282	Total								

Subcatchment D-12B: North of Culvert



Summary for Pond SP1: Stream

Inflow Area	a =	0.403 ac, 4	9.33% Impervious,	Inflow Depth > 0	.12" for WQv event
Inflow	=	0.03 cfs @	12.42 hrs, Volume	= 0.004 at	f
Primary	=	0.03 cfs @	12.42 hrs, Volume	= 0.004 a	f, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Stream



Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.002	74	>75% Grass cover, Good, HSG C (D-12B)
0.078	98	Paved parking, HSG D (D-12B)
0.121	98	Paved roads w/curbs & sewers, HSG D (D-12A)
0.125	30	Woods, Good, HSG A (D-12A)
0.078	77	Woods, Good, HSG D (D-12B)
0.403	73	TOTAL AREA

Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.125	HSG A	D-12A
0.000	HSG B	
0.002	HSG C	D-12B
0.276	HSG D	D-12A, D-12B
0.000	Other	
0.403		TOTAL AREA

19058 1-12A PR

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Ground Covers (all nodes)

HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
 0.000	0.000	0.002	0.000	0.000	0.002	>75% Grass cover, Good	D-12 B
0.000	0.000	0.000	0.078	0.000	0.078	Paved parking	D-12 B
0.000	0.000	0.000	0.121	0.000	0.121	Paved roads w/curbs & sewers	D-12 A
0.125	0.000	0.000	0.078	0.000	0.202	Woods, Good	D-12 A, D-12 B
0.125	0.000	0.002	0.276	0.000	0.403	TOTAL AREA	

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Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points Runoff by SCS TR-20 method, UH=SCS, Weighted-CN Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method												
Subcatchment D-12A: South of Culvert Runoff Area=10,700 sf 49.31% Tc=15.0 min (Impervious Runoff Depth>0.00" CN=64 Runoff=0.00 cfs 0.000 af											
Subcatchment D-12B: North of Culvert Runoff Area=6,852 sf 49.36% Flow Length=282' Tc=26.8 min (Impervious Runoff Depth>0.31" CN=87 Runoff=0.03 cfs 0.004 af											
Reach 2R: Swale Avg. Flow Depth=0.04' Max Vel=1 n=0.035 L=20.0' S=0.1500 '/' Capacity=7.5	I.48 fps Inflow=0.03 cfs 0.004 af 56 cfs Outflow=0.03 cfs 0.004 af											
Pond P1: Roadside Rain Garden Peak Elev=552.50' Storage Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.00	ge=0 cf Inflow=0.00 cfs 0.000 af 000 af Outflow=0.00 cfs 0.000 af											
Pond SP1: Stream	Inflow=0.03 cfs 0.004 af Primary=0.03 cfs 0.004 af											

Total Runoff Area = 0.403 acRunoff Volume = 0.004 afAverage Runoff Depth = 0.12"50.67% Pervious = 0.204 ac49.33% Impervious = 0.199 ac

Summary for Subcatchment D-12A: South of Culvert

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

Α	rea (sf)	CN	Description						
	5,276	98	Paved road	vaved roads w/curbs & sewers, HSG D					
	5,424	30	Woods, Go	od, HSG A					
	10,700	64	Weighted A	verage					
	5,424		50.69% Pervious Area						
	5,276		49.31% Impervious Area						
_		~							
IC	Length	Slope	e Velocity	Capacity	Description				
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)					
15.0					Direct Entry,				

Subcatchment D-12A: South of Culvert



Summary for Subcatchment D-12B: North of Culvert

Runoff = 0.03 cfs @ 12.42 hrs, Volume= 0.004 af, Depth> 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr WQv Rainfall=1.21"

A	rea (sf)	CN	Description							
	3,382	77	Woods, Go	od, HSG D						
	3,382	98	Paved park	ing, HSG D)					
	88	74	>75% Ġras	s cover, Go	bod, HSG C					
	6,852	87	Weighted A	verage						
	3,470		50.64% Pervious Area							
	3,382		49.36% Imp	pervious Ar	ea					
Ŧ	1			0						
IC	Length	Slope	e Velocity	Capacity	Description					
<u>(min)</u>	(feet)	(ft/ft) (ft/sec)	(cfs)						
22.3	50	0.0200	0.04		Sheet Flow,					
					Woods: Dense underbrush n= 0.800 P2= 2.96"					
4.5	232	0.0300	0.87		Shallow Concentrated Flow,					
					Woodland Kv= 5.0 fps					
26.8	282	Total								

Subcatchment D-12B: North of Culvert



Summary for Reach 2R: Swale



Summary for Pond P1: Roadside Rain Garden

Inflow Area	=	0.246 ac, 4	9.31% Imp	ervious,	Inflow Depth >	0.0	0" for	WQv	event	
Inflow	=	0.00 cfs @	20.00 hrs,	Volume	= 0.000) af				
Outflow	=	0.00 cfs @	20.00 hrs,	Volume	= 0.000) af, <i>1</i>	Atten=	91%,	Lag= 0.0 r	nin
Discarded	=	0.00 cfs @	20.00 hrs,	Volume	= 0.000) af				
Primary	=	0.00 cfs @	5.00 hrs,	Volume	= 0.000) af				

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 552.50' @ 20.00 hrs Surf.Area= 75 sf Storage= 0 cf

Plug-Flow detention time= 61.1 min calculated for 0.000 af (6% of inflow) Center-of-Mass det. time= 9.0 min (1,175.0 - 1,166.0)

Volume	Invert	Avail.Sto	rage Storag	ge Description	
#1	552.50'	70	06 cf Custo	m Stage Data (P	rismatic)Listed below (Recalc)
Elevatio (fee	on S et)	urf.Area (sɑ-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
552.5 552.7 553.0 554.0	50 75 00 00	74 160 250 1,000	0 29 51 625	0 29 81 706	
Device	Routing	Invert	Outlet Devic	ces	
#1	Discarded	552.50'	0.270 in/hr Excluded St	Exfiltration over urface area = 74 s	Surface area above 552.50'
#2	Primary	552.75'	5.0' long x Head (feet) 2.50 3.00 3 Coef. (Engli 2.65 2.67 2	5.0' breadth Bro 0.20 0.40 0.60 3.50 4.00 4.50 5 sh) 2.34 2.50 2. 2.66 2.68 2.70 2	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 5.00 5.50 70 2.68 2.68 2.66 2.65 2.65 2.65 2.74 2.79 2.88
		NA 0.00 C			

Discarded OutFlow Max=0.00 cfs @ 20.00 hrs HW=552.50' (Free Discharge) **1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=552.50' (Free Discharge) **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Type III 24-hr WQv Rainfall=1.21" Printed 8/31/2020 LC Page 11

Pond P1: Roadside Rain Garden



Summary for Pond SP1: Stream

Inflow Area	a =	0.403 ac, 4	9.33% Impe	rvious,	Inflow Dep	oth > ().12'	" for V	VQv event	
Inflow	=	0.03 cfs @	12.42 hrs,	Volume	= (0.004 a	f			
Primary	=	0.03 cfs @	12.42 hrs,	Volume	= (0.004 a	f, A	tten= 0%	6, Lag= 0.0	min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Stream


Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.195	96	Gravel surface, HSG D (DA 4-07i)
0.024	70	Woods, Good, HSG C (DA 4-07)
0.049	77	Woods, Good, HSG D (DA 4-07)
0.269	90	TOTAL AREA

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Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.000	HSG A	
0.000	HSG B	
0.024	HSG C	DA 4-07
0.245	HSG D	DA 4-07, DA 4-07i
0.000	Other	
0.269		TOTAL AREA

Ground Covers (all nodes)

HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
0.000	0.000	0.000	0.195	0.000	0.195	Gravel surface	DA 4-07i
0.000	0.000	0.024	0.049	0.000	0.074	Woods, Good	DA 4-07
0.000	0.000	0.024	0.245	0.000	0.269	TOTAL AREA	

19058 4-07 YMCA EX	Type III 24-hr HALF WQv Rainfall=0.60"
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Time span=5.00-20.00 hrs, dt=0.0	05 hrs, 301 points
Runoff by SCS TR-20 method, UH=	SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Po	and routing by Stor-Ind method
Subcatchment DA 4-07: Northwoods Rd Runoff Area=3	3,214 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=496'	Tc=15.8 min CN=75 Runoff=0.00 cfs 0.000 af
Subcatchment DA 4-07i: Northwoods Rd Runoff Area={	3,502 sf 0.00% Impervious Runoff Depth>0.26"
Flow Length=496'	Tc=15.8 min CN=96 Runoff=0.05 cfs 0.004 af
Pond SP1: Stream	Inflow=0.05 cfs 0.004 af Primary=0.05 cfs 0.004 af
Total Runoff Area = 0.269 ac Runoff Volur	me = 0.004 af Average Runoff Depth = 0.19"
100.00% Perviou	us = 0.269 ac 0.00% Impervious = 0.000 ac

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr HALF WQv Rainfall=0.60"

A	rea (sf)	CN	Description		
	1,063	70	Woods, Go	od, HSG C	
	2,151	77	Woods, Go	od, HSG D	
	3,214	75	Weighted A	verage	
	3,214		100.00% P	ervious Are	a
Тс	Length	Slope	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)	
10.9	50	0.1200	0.08		Sheet Flow,
					Woods: Dense underbrush n= 0.800 P2= 2.96"
4.9	446	0.0920	0 1.52		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
4 5 0	400	Tatal			

15.8 496 Total

Subcatchment DA 4-07: Northwoods Rd



Summary for Subcatchment DA 4-07i: Northwoods Rd

0.05 cfs @ 12.22 hrs, Volume= 0.004 af, Depth> 0.26" Runoff =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr HALF WQv Rainfall=0.60"

A	rea (sf)	CN D	escription						
	8,502	96 G	96 Gravel surface, HSG D						
	8,502	1	100.00% Pervious Area						
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description				
10.9	50	0.1200	0.08		Sheet Flow,				
4.9	446	0.0920	1.52		Woods: Dense underbrush n= 0.800 P2= 2.96" Shallow Concentrated Flow, Woodland Kv= 5.0 fps				
15.8	496	Total							

Subcatchment DA 4-07i: Northwoods Rd



Summary for Pond SP1: Stream

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

Inflow A	rea =	0.269 ac,	0.00% Imperviou	is, Inflow Dep	th > 0.1	9" for HA	LF WQv event
Inflow	=	0.05 cfs @	12.22 hrs, Volu	me= 0).004 af		
Primary	′ =	0.05 cfs @	12.22 hrs, Volu	me= 0).004 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Stream



Area Listing (all nodes)

Area	CN	Description
(acres)		(subcatchment-numbers)
0.195	96	Gravel surface, HSG D (DA 4-07i)
0.024	70	Woods, Good, HSG C (DA 4-07)
0.049	77	Woods, Good, HSG D (DA 4-07)
0.269	90	TOTAL AREA

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Soil Listing (all nodes)

Area	Soil	Subcatchment
(acres)	Group	Numbers
0.000	HSG A	
0.000	HSG B	
0.024	HSG C	DA 4-07
0.245	HSG D	DA 4-07, DA 4-07i
0.000	Other	
0.269		TOTAL AREA

Ground Covers (all nodes)

HSG-A	HSG-B	HSG-C	HSG-D	Other	Total	Ground	Subcatchment
 (acres)	(acres)	(acres)	(acres)	(acres)	(acres)	Cover	Numbers
0.000	0.000	0.000	0.195	0.000	0.195	Gravel surface	DA 4-07i
0.000	0.000	0.024	0.049	0.000	0.074	Woods, Good	DA 4-07
0.000	0.000	0.024	0.245	0.000	0.269	TOTAL AREA	

19058 4-07 YMCA PR			Type III 24	I-hr HALF	⁻ WQv Rainfa	ll=0.60"
Prepared by {enter your	company name here	}			Printed 7/	16/2020
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R Reach ro	Time span=5.00-20.0 unoff by SCS TR-20 m outing by Stor-Ind meth	0 hrs, dt=0.0 nethod, UH= nod - Pond	05 hrs, 301 p ⊧SCS, Weigh routing by S	ooints nted-CN tor-Ind me	thod	
Subcatchment DA 4-07: N	orthwoods Rd F Flow L	Runoff Area=3 _ength=496'	3,214 sf 0.00 Tc=15.8 min	0% Impervic CN=75 F	ous Runoff Dep Runoff=0.00 cfs	oth=0.00" 0.000 af
Subcatchment DA 4-07i: N	Northwoods Rd F Flow L	Runoff Area=8 _ength=496'	8,502 sf 0.00 Tc=15.8 min)% Impervic CN=96 F	ous Runoff Dep Runoff=0.05 cfs	oth>0.26" 0.004 af
Pond FB: Sed Forebay	Discarded=0.00 cfs 0.0	Peak Elev= 001 af Prima	595.92' Stora ary=0.05 cfs (age=23 cf 0.003 af O	Inflow=0.05 cfs utflow=0.05 cfs	0.004 af 0.004 af
Pond RG: Rain Garden	Discarded=0.00 cfs 0.0	Peak Elev= 001 af Prima	:594.90' Stora ary=0.00 cfs (age=94 cf 0.000 af O	Inflow=0.05 cfs utflow=0.00 cfs	0.003 af 0.001 af
Pond SP1: Stream				Pr	Inflow=0.00 cfs imary=0.00 cfs	0.000 af 0.000 af
Total Runo	ff Area = 0.269 ac R 100.0	unoff Volui 0% Perviou	me = 0.004 a ıs = 0.269 a	af Averag c 0.00%	e Runoff Dep Impervious =	th = 0.19" • 0.000 ac

Summary for Subcatchment DA 4-07: Northwoods Rd

[45] Hint: Runoff=Zero

Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr HALF WQv Rainfall=0.60"

A	rea (sf)	CN	Description		
	1,063	70	Woods, Go	od, HSG C	
	2,151	77	Woods, Go	od, HSG D	
	3,214	75	Weighted A	verage	
	3,214		100.00% P	ervious Are	a
Тс	Length	Slope	e Velocity	Capacity	Description
(min)	(feet)	(ft/ft) (ft/sec)	(cfs)	
10.9	50	0.1200	0.08		Sheet Flow,
					Woods: Dense underbrush n= 0.800 P2= 2.96"
4.9	446	0.0920) 1.52		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
4 - 0	400	T			

15.8 496 Total

Subcatchment DA 4-07: Northwoods Rd



Summary for Subcatchment DA 4-07i: Northwoods Rd

0.05 cfs @ 12.22 hrs, Volume= 0.004 af, Depth> 0.26" Runoff =

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Type III 24-hr HALF WQv Rainfall=0.60"

A	rea (sf)	CN D	escription		
	8,502	96 G	Gravel surfa	ace, HSG D	
	8,502	1	00.00% Pe	ervious Are	a
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.9	50	0.1200	0.08		Sheet Flow,
4.9	446	0.0920	1.52		Woods: Dense underbrush n= 0.800 P2= 2.96" Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.8	496	Total			

Subcatchment DA 4-07i: Northwoods Rd



Summary for Pond FB: Sed Forebay

Inflow Area	=	0.269 ac,	0.00% Impervious, Inflow De	epth > 0.19" f	or HALF WQv event
Inflow	=	0.05 cfs @	12.22 hrs, Volume=	0.004 af	
Outflow	=	0.05 cfs @	12.24 hrs, Volume=	0.004 af, Atten	= 0%, Lag= 0.9 min
Discarded	=	0.00 cfs @	12.24 hrs, Volume=	0.001 af	
Primary	=	0.05 cfs @	12.24 hrs, Volume=	0.003 af	

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 595.92' @ 12.24 hrs Surf.Area= 84 sf Storage= 23 cf

Plug-Flow detention time= 50.7 min calculated for 0.004 af (89% of inflow) Center-of-Mass det. time= 16.0 min (822.7 - 806.7)

Volume	Inve	ert Avail.Sto	orage Storag	e Description	
#1	595.5	50'	30 cf Custo	m Stage Data (P	r ismatic) Listed below (Recalc)
Elevatio (fee	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	
595.5 596.0	50 00	24 95	0 30	0 30	
Device	Routing	Invert	Outlet Devic	ces	
#1	Primary	595.90'	5.0' long x Head (feet) 2.50 3.00 Coef. (Engli 3.03 3.28 3	1.5' breadth Bro 0.20 0.40 0.60 sh) 2.62 2.64 2. 3.32	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 64 2.68 2.75 2.86 2.92 3.07 3.07
#2	Discarde	d 595.50'	0.600 in/hr Excluded Si	Exfiltration over urface area = 24 s	Surface area above 595.50' ^f

Discarded OutFlow Max=0.00 cfs @ 12.24 hrs HW=595.92' (Free Discharge) **1**–2=Exfiltration (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.05 cfs @ 12.24 hrs HW=595.92' (Free Discharge) 1=Broad-Crested Rectangular Weir (Weir Controls 0.05 cfs @ 0.40 fps)

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Pond FB: Sed Forebay

Summary for Pond RG: Rain Garden

Inflow Area	ι =	0.269 ac,	0.00% Impervious,	Inflow Depth >	0.14"	for HALI	F WQv event
Inflow	=	0.05 cfs @	12.24 hrs, Volume	= 0.003	af		
Outflow	=	0.00 cfs @	14.03 hrs, Volume	= 0.001	af, Atter	n= 92%,	Lag= 107.4 min
Discarded	=	0.00 cfs @	14.03 hrs, Volume	= 0.001	af		
Primary	=	0.00 cfs @	14.03 hrs, Volume	= 0.000	af		

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs Peak Elev= 594.90' @ 14.03 hrs Surf.Area= 308 sf Storage= 94 cf

Plug-Flow detention time= 220.5 min calculated for 0.001 af (44% of inflow) Center-of-Mass det. time= 153.2 min (955.8 - 802.6)

Volume	Inve	ert Avail.Sto	rage Storage	e Description		
#1	594.5	0' 7	98 cf Custon	n Stage Data (Pi	r ismatic) Listed below (Recalc)	
Elevatio	on et)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)		
594.5	50	161	0	0		
595.0	00	343	126	126		
596.0	00	1,000	672	798		
Device	Routing	Invert	Outlet Device	es		
#1	Primary	594.90'	4.0' long x 1 Head (feet) (2.50 3.00 Coef (Englis)	.5' breadth Bro 0.20 0.40 0.60 h) 2 62 2 64 2	ad-Crested Rectangular Weir 0.80 1.00 1.20 1.40 1.60 1.80 2.00 64 2.68 2.75 2.86 2.92 3.07 3.07	
#2	#2 Discarded 594.50'		3.03 3.28 3.32 0.600 in/hr Exfiltration over Surface area above 594.50' Excluded Surface area = 161 sf			

Discarded OutFlow Max=0.00 cfs @ 14.03 hrs HW=594.90' (Free Discharge) **2=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 14.03 hrs HW=594.90' (Free Discharge) ▲ 1=Broad-Crested Rectangular Weir (Weir Controls 0.00 cfs @ 0.13 fps)

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Pond RG: Rain Garden

Summary for Pond SP1: Stream

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

Inflow Are	ea =	0.269 ac,	0.00% Impervious,	Inflow Depth = 0.0	01" for HALF WQv event
Inflow	=	0.00 cfs @	14.03 hrs, Volume	= 0.000 af	
Primary	=	0.00 cfs @	14.03 hrs, Volume	= 0.000 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Pond SP1: Stream

Appendix D Pollutant Removal Calculations







Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed 1. From MassDEP Stormwater Handbook Vol. 1

