

STORMWATER MANAGEMENT REPORT

BABBIDGE FARMS SUBDIVISION FALMOUTH ROAD WINDHAM, MAINE

A. Narrative

Sebago Heights, LLC is proposing to develop property located on Falmouth Road in Windham as a 17-lot residential subdivision. The project site is identified as Lot 44 on the Town of Windham Assessors Map 13. This lot is approximately 29.7 acres and is located in the Farm zoning district.

The project will consist of 17 single-family residential lots including the construction of approximately 1,750 linear feet of roadway, utilities and stormwater infrastructure. In general, the site drains northwesterly to McIntosh Brook which runs along the northwesterly property boundary. McIntosh Brook crosses Falmouth Road and eventually discharges to Highland Lake which has been defined by the Maine Department of Environmental Protection (MDEP) as a Lake Most at Risk from New Development.

B. Alterations to Land Cover

The 29.7-acre lot is currently an undeveloped wooded lot with the exception of a gravel road extending through the property. The proposed roadway will generate approximately 47,200 square feet (1.08 acres) of impervious area while the proposed lot development is estimated to generate an additional 44,935 square feet (1.03 acres) totaling approximately 92,135 square feet (2.11 acres) of new impervious area. The proposed development will be permitted as a 17-lot residential subdivision on a less than 30-acre lot which does not require MDEP Site Location of Development Act approval but because the project is in a Lake Watershed Most at Risk from New Development and will generate more than 20,000 square feet of new impervious surface, it will require a Chapter 500 Stormwater Permit. The project will be reviewed under the Chapter 500 Basic and Phosphorous Standards.

The site is moderately sloped, draining northwesterly to McIntosh Brook although there are natural slopes greater than 3:1 forming the channels. Soils on the property were determined utilizing the Medium Intensity Soil Maps for Cumberland County, Maine published by the Natural Resources Conservation Service.

Table 1 – On-Site Soils		
Soils Label	Soils Name	HSG
EmB	Elmwood fine sandy loam	B/D
MkB, MkC	Merrimac fine sandy loam	A
PfB, PfC, PfD	Paxton very stony fine sandy loam	C
WsB	Woodbridge very stony fine sandy loam	C/D

C. Methodology and Modeling Assumptions

The proposed stormwater management system has been designed utilizing Best Management Practices to maintain existing drainage patterns while providing stormwater quality improvement measures. The goal of the storm drainage system design is to remove potential

stormwater pollutants from runoff generated by the development while providing attenuation of the peak rates of runoff leaving the site.

D. Basic Standards

The project is required by the Town and the MDEP to provide permanent and temporary Erosion Control Best Management Practices. These methods are outlined in detail in the plan set.

E. Phosphorous Standard

The MDEP requires that any project under review of the Chapter 500 Stormwater Management standards and is within a Watershed of a Lake Most at Risk from New Development, it must meet the Phosphorous Standards. To reduce the property's phosphorous export, the stormwater infrastructure includes the construction of three underdrained filter basins, five bioretention cells and forested buffers.

The calculations were prepared for this standard and indicated that with the use of the proposed stormwater BMP's, the project's stormwater infrastructure has reduced the site's phosphorous export by approximately 71%. To mitigate for the phosphorous that does leave the site, a compensation fee of \$10,931 will be paid. The calculations related to the Phosphorous Standard and the BMP sizing calculations have been included as an attachment to this report.

F. Flooding Standard

The project has been designed to maintain pre-development peak flow rates for the 2, 10 and 25-year storm recurrence frequencies in the post development condition as shown in the following table.

SP-1	Pre-Development (cfs)			Post-Development (cfs)		
	2-YR	10-YR	25-YR	2-YR	10-YR	25-YR
	26.99	62.84	94.95	25.08	62.68	88.34

G. Maintenance of common facilities or property

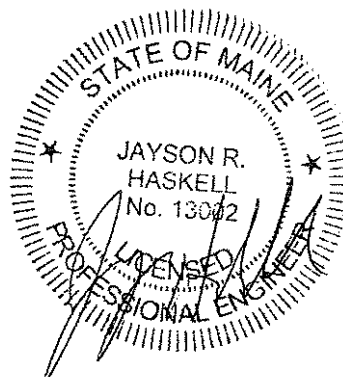
The property owner will be responsible for the maintenance of the stormwater facilities until an association is created. Enclosed within this submission is an Inspection, Maintenance and Housekeeping Plan for the project.

Prepared by:

DM ROMA CONSULTING ENGINEERS

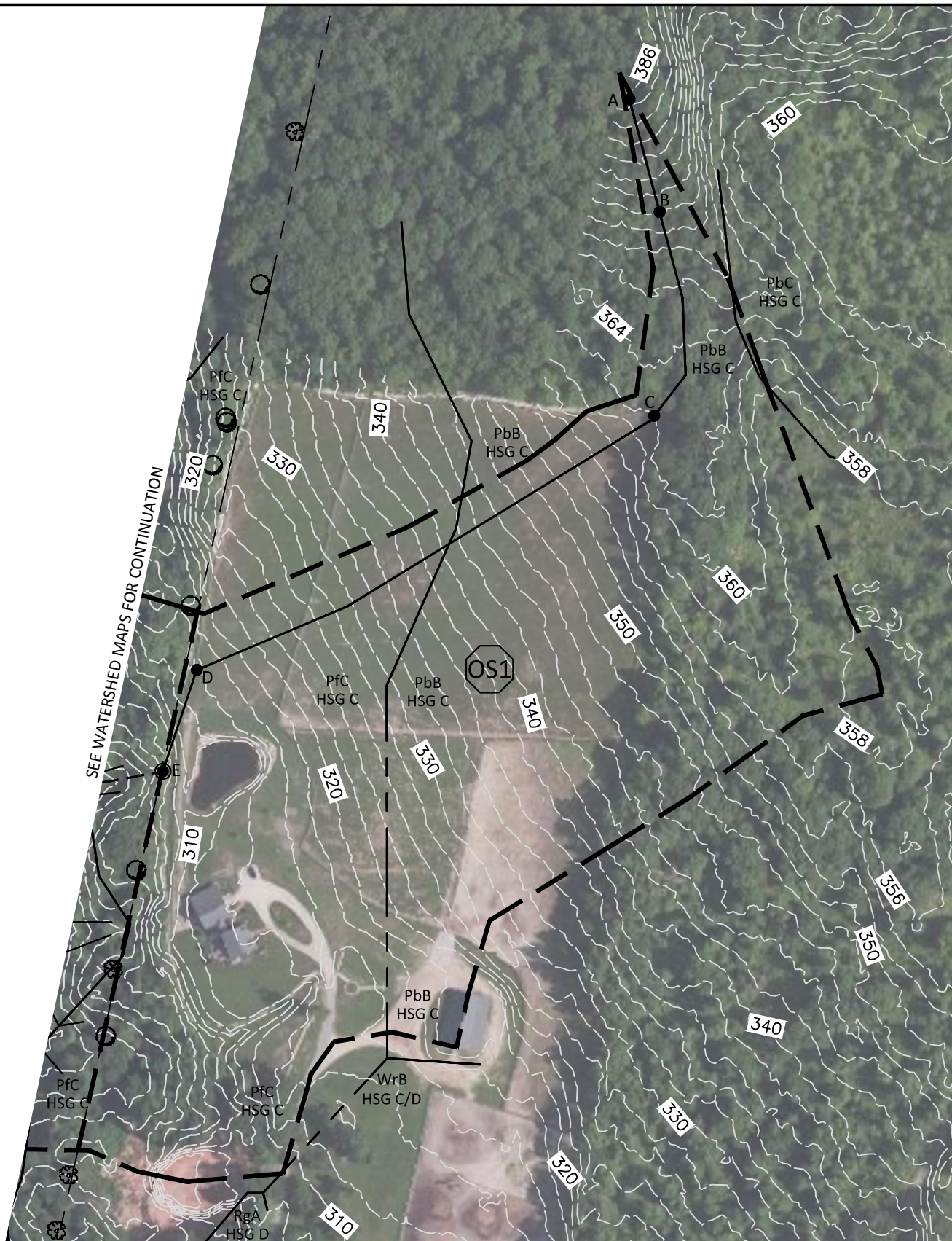


Jayson R. Haskell, P.E.
Project Manager



ATTACHMENT 1

OFFSITE WATERSHED MAP



OFFSITE WATERSHED MAP

BABBIDGE FARMS SUBDIVISION
WINDHAM, MAINE

FOR RECORD OWNER:
SEBAGO HEIGHTS, LLC
97A EXCHANGE STREET, SUITE 304
PORTLAND, MAINE

SCALE: 1"=180'
DATE: 5-25-2017
JOB NUMBER: 15024

DM ROMA

CONSULTING ENGINEERS

59 HARVEST HILL RD
WINDHAM, ME 04062
(207) 310 - 0506

ATTACHMENT 2

PHOSPHOROUS CALCULATIONS

Worksheet 1 - PPB calculations

Project Name: BABBIDGE FARMS SUBDIVISION

Lake Watershed: HIGHLAND LAKE

Town: WINDHAM

Standard Calculations

Watershed per acre phosphorus budget (Appendix C)	PAPB	0.027	lbs P/acre/year
Total acreage of development parcel:	TA	29.73	acres
NWI wetland acreage:	WA	4	acres
Steep slope acreage:	SA	0	acres
Project acreage: $A = TA - (WA + SA)$	A	25.73	acres
Project Phosphorus Budget: $PPB = P \times A$	PPB	0.69471	lbs P/year

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than the the Standard Calculation PPB.

Small Watershed Threshold (Appendix C):	SWT	189	acres
Project acreage:	A	29.73	acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	FC		lbs P/year
Area available for development (Appendix C):	AAD		acres
Ratio of A to AAD ($R = A/AAD$)	R	N/A	

Project Phosphorus Budget

If $R < 0.5$, $PPB = [(FC \times R)/2] + [FC/4]$	PPB	N/A	lbs P/year
If $R > 0.5$, $PPB = FC \times R$	PPB	N/A	lbs P/year

Worksheet 2

Pre-PPE and Post-PPE Calculations

Calculate phosphorus export from development for before and after treatment
Use as many sheets as needed for each development type (commercial, roads, residential lots, etc.)

Project name: BABBIDGE FARM SUBDIVISION

Development type: RESIDENTIAL

Sheet # 1 OF 1

Land Surface Type or Lot #(s) with description	Acres or # of lots	Export Coefficient from Table 3.1 Table 3.2	Pre- treatment Algal Av. P Export (lbs P/year)	Treatment Factor for BMP(s) from Chapter 6	Post- treatment Algal Av. P Export (lbs P/year)	Description of BMPs
Subdivision Road-Treated	0.335	1.25	0.41875	0.32	0.134	Low Export - Filter Basin 1
Subdivision Road-Treated	0.309	1.25	0.38625	0.18	0.069525	Low Export - Filter Basin 2
Subdivision Road-Treated	0.385	1.25	0.48125	0.34	0.163625	Low Export - Filter Basin 3
Subdivision Road-Untreated	0.033	1.25	0.04125	1	0.04125	Low Export
Ditches & Ponds-D-Treated	0.437	0.4	0.1748	0.32	0.055936	Low Export - Filter Basin 1
Ditches & Ponds-C-Treated	0.142	0.3	0.0426	0.18	0.007668	Low Export - Filter Basin 2
Ditches & Ponds-D-Treated	0.308	0.4	0.1232	0.18	0.022176	Low Export - Filter Basin 2
Ditches & Ponds-C-Treated	0.133	0.3	0.0399	0.34	0.013566	Low Export - Filter Basin 3
Ditches & Ponds-D-Treated	0.225	0.4	0.09	0.34	0.0306	Low Export - Filter Basin 3
Road Slopes-C-Treated	0.065	0.3	0.0195	0.2	0.0039	Low Export to Forested Buffer 1
Road Slopes-C-Treated	0.025	0.3	0.0075	0.2	0.0015	Low Export to Forested Buffer 2
Road Slopes-D-Treated	0.03	0.4	0.012	0.33	0.00396	Low Export to Forested Buffer 3
Ditches & Ponds-C-Untreated	0.143	0.3	0.0429	1	0.0429	Low Export - No Treatment
Ditches & Ponds-D-Untreated	0.2	0.4	0.08	1	0.08	Low Export - No Treatment
Lot 1 - D - Treated	1	0.23	0.23	0.19	0.0437	With Restrictions to Bioretention Cell

Lot 2 - D - Treated	1	0.23	0.23	0.24	0.0552	With Restrictions to Bioretention Cell
Lot 3 - D - Treated	1	0.23	0.23	0.3	0.069	With Restrictions to Bioretention Cell
Lot 4 - D - Treated	1	0.23	0.23	0.28	0.0644	With Restrictions to Bioretention Cell
Lots 5 & 6 - C - Treated	2	0.15	0.3	0.2	0.06	With Restrictions to Forested Buffer 1
Lot 7 - C - Treated	1	0.15	0.15	0.15	0.0225	With Restrictions-Driveway to Buffer 1-Treated Bio Cell
Lot 8 - C - Treated	1	0.15	0.15	0.2	0.03	With Restrictions to Forested Buffer 2
Lots 9 & 10 - D - Treated	2	0.18	0.36	0.33	0.1188	With Restrictions to Forested Buffer 3
Lots 11 thru 13 - D - Treated	3	0.23	0.69	0.34	0.2346	With Restrictions, No Buffer, to Filter Basins 3
Lots 14 thru 16 - D - Treated	3	0.23	0.69	0.18	0.1242	With Restrictions, No Buffer, to Filter Basins 2
Lot 17 - C - Treated	1	0.2	0.2	0.32	0.064	With Restrictions, No Buffer, to Filter Basin 1
		Total Pre-PPE (lbs P/year)	5.4199	Total PostPPE (lbs P/year)	1.557006	

Appendix D: Worksheet 3 - Mitigation credit

Project name: BABBIDGE FARMS SUBDIVISION

Development type: RESIDENTIAL

Sheet # 1 OF 1

Mitigation credit when a pre-existing source is being eliminated

Mitigation Source Area Land Use	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre- treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)		Mitigation Credit (lbs P/year)	Comments
Existing Gravel Road	0.104	1.75	0.5	0.091	1	0.091		0.091	
			0.5	0	1	0		0	
			0.5	0	1	0		0	
Total source elimination mitigation credit (SEC)									0.091 lbs P/year

Mitigation credit when a pre-existing source is treated by a new BMP

Mitigation Source Area Land Use	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre- treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)	Treatment Factor for New BMP(s) Chapter 6	Mitigation Credit (lbs P/year)	Comments
Falmouth Road	0.131	1.75	0.5	0.114625	1	0.114625	1 - 0.38	0.0710675	Filter Basin 1
			0.5	0	1	0	1 -	0	
			0.5	0	1	0	1 -	0	
Total source treatment mitigation credit (STC)									0.0710675 lbs P/year

TOTAL MITIGATION CREDIT (SEC + STC) 0.1620675 lbs P/year

WORKSHEET 4 - PROJECT PHOSPHORUS EXPORT SUMMARY

Summarizing the project's algal available phosphorus export (PPE)

Project Name:

Project Phosphorus Budget - Worksheet 1	PPB	0.69	lbs P/year
Total Pre-Treatment Phosphorus Export - Worksheet 2	Pre-PPE	5.42	lbs P/year
Total Post-Treatment Phosphorus Export - Worksheet 2	Post-PPE	1.56	lbs P/year
Total Phosphorus Mitigation Credit - Worksheet 3	TMC	0.16	lbs P/year
Project Phosphorus Export (Post-PPE - TMC)	PPE	1.39	lbs P/year

Is the Project Phosphorus Export \leq the Project Phosphorus Budget? (PPE \leq PPB)

<p>If YES, PPE is less than or equal to PPB and the project meets its phosphorus budget.</p> <p>If NO, PPE is greater than PPB, more reduction in phosphorus export is required or the payment of a compensation fee may be an option</p>	NO
The amount of phosphorus that needs further treatment or compensation	0.70 lbs P/year

Has Project Phosphorus Export been sufficiently reduced?

Is (Pre-PPE - Post-PPE)/Pre-PPE greater than 0.60?

<p>If YES, in some watersheds the compensation fee is an available option.</p> <p>If NO, more treatment must be provided. PPE must be further reduced.</p>	YES
The post-treatment phosphorus export must be less than 40% of the pre-treatment export (Post-PPE < 0.4*Pre-PPE)	71.27 %

If the project is located in a watershed that is eligible for a compensation fee (or is a residential subdivision with buffers), a compensation fee may be appropriate as follows:

If Project Export has been reduced by greater than 60% and less than 75%, \$25,000 per pound minus \$833 per 1% Percent Export	\$10,931
If Project Export has been reduced by greater than 75%, \$12,500 per pound minus \$500 per 1% Project Export	

ATTACHMENT 3

BMP SIZING CALCULATIONS

Babbidge Farms Subdivision

* All new buildings shall install a rooftop drip edge to provide treatment for the rooftop impervious surface. The building's impervious area is included in the watershed and overall treatment calculations, but not included in the sizing calculations for each device.

Filter Basin FB-1

Tributary Impervious Area=	27,735 sf	(WS-10 & 11 Impervious)
Tributary Landscaped Area=	35,615 sf	(WS-10 & 11 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 3,498 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
268	2,525	0
270	4,775	7,300
272	6,760	18,835

Outlet Elevation = 269.50

Storage Volume Provided = 4,416 cf > Required

Total Storage Volume Provided=

Filter Bottom Calculation

Filter Area (Required) = $5\% \times \text{Impervious Area} + 2\% \times \text{Landscaped Area}$

Filter Area Required = 2,099 sf

Filter Area Provided = 2,525 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.32

Filter Basin FB-2

Tributary Impervious Area=	17,180 sf	(WS-20 & 21 Impervious)
Tributary Landscaped Area=	47,580 sf	(WS-20 & 21 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 3,018 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
272.5	1,980	0
274	3,620	4,200
276	5,675	13,495

Outlet Elevation = 274.00

Storage Volume Provided = 4,200 cf > Required

Total Storage Volume Provided=

Filter Bottom Calculation

Filter Area (Required) = $5\% \times \text{Impervious Area} + 2\% \times \text{Landscaped Area}$

Filter Area Required = 1,811 sf

Filter Area Provided = 1,980 sf > Required

Filter Basin 2 Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.29

Runoff then Tributary to Forested Stormwater Buffer 4

Stormwater Buffer 5 Treatment Factor: 0.40 (See Buffer Sizing Calculations)

BMPs in Series Treatment Factor Calculation

TF(combined) = $\text{TF}(\text{FB2}) \times \text{TF}(\text{Buffer})^{0.5}$

TF(combined)= 0.18

Filter Basin FB-3

Tributary Impervious Area=	19,450 sf	(WS-30&31 Impervious)
Tributary Landscaped Area=	47,565 sf	(WS-30&31 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 3,206 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
273	1,950	0
274	2,515	2,233
276	3,860	8,608

Outlet Elevation = 274.50

Storage Volume Provided = 3,826 cf > Required

Total Storage Volume Provided=

Filter Bottom Calculation

Filter Area (Required) = $5\% \times \text{Impervious Area} + 2\% \times \text{Landscaped Area}$

Filter Area Required = 1,924 sf

Filter Area Provided = 1,950 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.34

Bioretention Cell BR-1

Tributary Impervious Area= 0 sf (WS-12 Impervious)
Tributary Landscaped Area= 7,585 sf (WS-12 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 253 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
270.5	270	0
272	1,360	1,223

Storage From Filter Media (1/3 Filter Volume)= 135 cf
Outlet Elevation = 271.00
Storage Volume Above Media= 408 cf
Total Storage Volume Provided= 543 cf > Required

Filter Bottom Calculation

Filter Area (Required) = $7\% \times \text{Impervious Area} + 3\% \times \text{Landscaped Area}$

Filter Area Required = 228 sf

Filter Area Provided = 270 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.19

Bioretention Cell BR-2

Tributary Impervious Area= 1,270 sf (WS-13 Impervious)
Tributary Landscaped Area= 7,865 sf (WS-13 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = 1.0"xImpervious Area + 0.4"xLandscaped Area

WQV (Required) = 368 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
276.5	395	0
278	1,310	1,279

Storage From Filter Media (1/3 Filter Volume)= 198 cf

Outlet Elevation = 277.00

Storage Volume Above Media= 426 cf

Total Storage Volume Provided= 624 cf > Required

Filter Bottom Calculation

Filter Area (Required) = 7% x Impervious Area + 3% x Landscaped Area

Filter Area Required = 325 sf

Filter Area Provided = 395 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = 0.4 (WQV-Required / WQV-Provided)

TF = 0.24

Bioretention Cell BR-3

Tributary Impervious Area=	1,305 sf	(WS-22 Impervious)
Tributary Landscaped Area=	8,575 sf	(WS-22 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 395 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
277	405	0
278	870	638

Storage From Filter Media (1/3 Filter Volume)=	203 cf
Outlet Elevation =	277.50
Storage Volume Above Media=	319 cf
Total Storage Volume Provided=	521 cf > Required

Filter Bottom Calculation

Filter Area (Required) = $7\% \times \text{Impervious Area} + 3\% \times \text{Landscaped Area}$

Filter Area Required = 349 sf

Filter Area Provided = 405 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.30

Bioretention Cell BR-4

Tributary Impervious Area=	775 sf	(WS-23 Impervious)
Tributary Landscaped Area=	6,585 sf	(WS-23 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 284 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
277	310	0
278	710	510

Storage From Filter Media (1/3 Filter Volume)=	155 cf
Outlet Elevation =	277.50
Storage Volume Above Media=	255 cf
Total Storage Volume Provided=	410 cf > Required

Filter Bottom Calculation

Filter Area (Required) = $7\% \times \text{Impervious Area} + 3\% \times \text{Landscaped Area}$

Filter Area Required = 252 sf

Filter Area Provided = 310 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.28

Bioretention Cell BR-5

Tributary Impervious Area= 0 sf (WS-33 Impervious)
Tributary Landscaped Area= 3,290 sf (WS-33 Landscaped Area)

Water Quality Volume (WQV) Calculation

WQV (Required) = $1.0 \times \text{Impervious Area} + 0.4 \times \text{Landscaped Area}$

WQV (Required) = 110 cf

Stage Storage Volume

Elevation	Area (sf)	Storage (cf)
271.8	240	0
272	320	56
273	745	588

Storage From Filter Media (1/3 Filter Volume)= 120 cf
Outlet Elevation = 272.30
Storage Volume Above Media= 216 cf
Total Storage Volume Provided= 336 cf > Required

Filter Bottom Calculation

Filter Area (Required) = $7\% \times \text{Impervious Area} + 3\% \times \text{Landscaped Area}$

Filter Area Required = 99 sf

Filter Area Provided = 240 sf > Required

Treatment Factor (Phosphorous Calculations)

TF = $0.4 \times (\text{WQV-Required} / \text{WQV-Provided})$

TF = 0.13

TF= 0.15 (Min. TF for Filter BMPs)

Buffer Calculations

All proposed buffers are classified as buffer downgradient of a single family residential lot unless noted

Forested Stormwater Buffer 1

Test Pit: TP-39
Soil: Dixfield
Class: Stony fine sandy loam
HSG: C/D
Required Buffer Length: 50 ft
Provided Buffer Length: 100 ft

Treatment Factor (Phosphorous Calculations)

TF = 0.4 (L-Required / L-Provided)

TF = 0.20

Forested Stormwater Buffer 2

Test Pit: TP-37
Soil: Skerry
Class: Stony fine sandy loam
HSG: C
Required Buffer Length: 50 ft
Provided Buffer Length: 100 ft

Treatment Factor (Phosphorous Calculations)

TF = 0.4 (L-Required / L-Provided)

TF = 0.20

Forested Stormwater Buffer 3

Test Pit: TP-35
Soil: Skerry
Class: Stony sandy loam
HSG: C
Required Buffer Length: 50 ft
Provided Buffer Length: 60 ft

Treatment Factor (Phosphorous Calculations)

TF = 0.4 (L-Required / L-Provided)

TF = 0.33

Forested Stormwater Buffer 4 (with Level Lip Spreader)

Test Pit: TP-39
Soil: Dixfield
Class: Stony fine sandy loam
HSG: C/D
Buffer Length= 150 ft
Berm Length Per Acre Impervious = 90 ft
Berm Length Per Acre Landscape = 30 ft
Required Berm Length: 68 ft
Provided Berm Length: 68 ft

Treatment Factor (Phosphorous Calculations)

TF = 0.4 (L-Required / L-Provided)

TF = 0.40

ATTACHMENT 4

MAINTENANCE PLAN

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

BABBIDGE FARMS SUBDIVISION WINDHAM, MAINE

Responsible Party

Owner: Sebago Heights, LLC
 97A Exchange Street, Suite 304
 Portland, Maine 04101

The owners are responsible for the maintenance of all stormwater management structures and related site components and the keeping of a maintenance log book with service records until such time that a homeowner's association is created. Records of all inspections and maintenance work performed must be kept on file with the owner and retained for a minimum of five years. The maintenance log will be made available to the Town and Maine Department of Environmental Protection (MDEP) upon request. At a minimum, the maintenance of stormwater management systems will be performed on the prescribed schedule.

The procedures outlined in this plan are provided as a general overview of the anticipated practices to be utilized on this site. In some instances, additional measures may be required due to unexpected conditions. *The Maine Erosion and Sedimentation Control BMP* and *Stormwater Management for Maine: Best Management Practices* Manuals published by the MDEP should be referenced for additional information.

During Construction

- 1. Inspection and Corrective Action:** It is the contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. Inspection shall occur on all disturbed and impervious areas, erosion control measures, material storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as 24 hours before and after a storm event and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in the permit, shall conduct the inspections.
- 2. Maintenance:** Erosion controls shall be maintained in effective operating condition until areas are permanently stabilized. If best management practices (BMPs) need to be repaired, the repair work should be initiated upon discovery of the problem but no later than the end of the next workday. If BMPs need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within seven calendar days and prior to any rainfall event.

3. **Documentation:** A report summarizing the inspections and any corrective action taken must be maintained on site. The log must include the name(s) and qualifications of the person making the inspections; the date(s) of the inspections; and the major observations about the operation and maintenance of erosion and sedimentation controls, materials storage areas, and vehicle access points to the parcel. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and location(s) where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to MDEP staff, and a copy must be provided upon request. The owner shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

Houskeeping

1. **Spill prevention:** Controls must be used to prevent pollutants from construction and waste materials on site to enter stormwater, which includes storage practices to minimize exposure of the materials to stormwater. The site contractor or operator must develop, and implement as necessary, appropriate spill prevention, containment, and response planning measures.
2. **Groundwater protection:** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials. Any project proposing infiltration of stormwater must provide adequate pre-treatment of stormwater prior to discharge of stormwater to the infiltration area, or provide for treatment within the infiltration area, in order to prevent the accumulation of fines, reduction in infiltration rate, and consequent flooding and destabilization.
3. **Fugitive sediment and dust:** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control, but other water additives may be considered as needed. A stabilized construction entrance (SCE) should be included to minimize tracking of mud and sediment. If off-site tracking occurs, public roads should be swept immediately and no less than once a week and prior to significant storm events. Operations during dry months, that experience fugitive dust problems, should

wet down unpaved access roads once a week or more frequently as needed with a water additive to suppress fugitive sediment and dust.

4. **Debris and other materials:** Minimize the exposure of construction debris, building and landscaping materials, trash, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials to precipitation and stormwater runoff. These materials must be prevented from becoming a pollutant source.
5. **Excavation de-watering:** Excavation de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water removed from the ponded area, either through gravity or pumping, must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the Department.
6. **Authorized Non-stormwater discharges:** Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:
 - (a) Discharges from firefighting activity;
 - (b) Fire hydrant flushings;
 - (c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);
 - (d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);
 - (e) Routine external building washdown, not including surface paint removal, that does not involve detergents;
 - (f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;
 - (g) Uncontaminated air conditioning or compressor condensate;
 - (h) Uncontaminated groundwater or spring water;
 - (i) Foundation or footer drain-water where flows are not contaminated;
 - (j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));
 - (k) Potable water sources including waterline flushings; and
 - (l) Landscape irrigation.
7. **Unauthorized non-stormwater discharges:** Approval from the MDEP does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges

in compliance with Section 6 above. Specifically, the MDEP's approval does not authorize discharges of the following:

- (a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;
- (b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;
- (c) Soaps, solvents, or detergents used in vehicle and equipment washing; and
- (d) Toxic or hazardous substances from a spill or other release.

Post construction

- 1. Inspection and Corrective Action:** All measures must be maintained by the owner in effective operating condition. A person with knowledge of erosion and stormwater control, including the standards and conditions of the permit, shall conduct the inspections. The following areas, facilities, and measures must be inspected, and identified deficiencies must be corrected. Areas, facilities, and measures other than those listed below may also require inspection on a specific site.
 - A. Vegetated Areas:** Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.
 - B. Ditches, Swales, and Open Channels:** Inspect ditches, swales, and other open channels in the spring, late fall, and after heavy rains to remove any obstructions to flow, remove accumulated sediments and debris, control vegetative growth that could obstruct flow, and repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side slopes.
 - C. Culverts:** Inspect culverts in the spring, late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

- D. Buffers:** Wooded buffers must remain fully wooded and have no disturbance to the duff layer. Vegetation in non-wooded buffers may not be cut more than three times per year, and may not be cut shorter than six inches. Stormwater runoff should enter the buffer as sheet flow, and any observed channelization of flows or erosion should be corrected immediately. Activities that may result in disturbance of the duff layer are prohibited in a buffer.
- E. Underdrained Filter Basin and Bioretention Cell:** Basin should be inspected semi-annually and following major storm events for the first year and every six months thereafter. The basin should drain within 48 hours following a one-inch storm and if a larger storm fills the system to overflow, it shall drain within 36 to 60 hours. If ponding exceeds 48 hours, the top of the filter bed must be rototilled to reestablish the soil's filtration capacity. If water ponds on the surface of the bed for more than 72 hours, the top several inches of the filter shall be replaced with fresh material. Inspect for debris and sediment build up in the forebay and basin and remove as needed. Mowing of the basin can only occur semi-annually to a height of no less than 6 inches utilizing a hand-held string trimmer or push-mower. Any bare areas or erosion rills shall be repaired with new filter media or sandy loam then seeded and mulched. The basin should also be inspected annually for destabilization of side slopes, embankment settling and other signs of structural failure.
- F. Roofline Dripedge:** The dripedges should be inspected semi-annually and following major storm events for the first year and every six months thereafter. The reservoir crushed stone should drain within 48 hours following a one-inch storm and if a larger storm fills the system to overflow, it shall drain within 36 to 60 hours. If ponding exceeds 48 hours, the stone reservoir course shall be removed and the filter bed be rototilled to reestablish the soil's filtration capacity. If water ponds in the reservoir course for more than 72 hours, the top several inches of the filter shall be replaced with fresh material. Inspect for debris and sediment build up at surface and remove as needed. The dripedges are part of the stormwater management plan and cannot be paved over or altered in anyway.
- G. Outlet Structure:** Inspect and, if required, clean out structures at least once a year, preferably in early spring. Clean out must include the removal and legal disposal of any accumulated sediments and debris at the bottom of the basin, at any inlet grates, at any inflow channels to the basin, and at any pipes between basins. If the basin outlet is designed to trap floatable materials, then remove the floating debris and any floating oils (using oil-absorptive pads).
- H. Regular Maintenance:** Clear accumulations of winter sand along roadway once a year, preferably in the spring. Accumulations on pavement may be removed by pavement sweeping. Accumulations of sand along pavement shoulders may be

removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader.

- I. **Documentation:** Keep a log (report) summarizing inspections, maintenance, and any corrective actions taken. The log must include the date on which each inspection or maintenance task was performed, a description of the inspection findings or maintenance completed, and the name of the inspector or maintenance personnel performing the task. If a maintenance task requires the clean-out of any sediments or debris, indicate where the sediment and debris was disposed after removal. The log must be made accessible to Town staff upon request. The permittee shall retain a copy of the log for a period of at least five years from the completion of permanent stabilization. Attached is a sample log.

Re-certification

Submit a certification of the following to the MDEP within three months of the expiration of each five-year interval from the date of issuance of the permit.

- (a) **Identification and repair of erosion problems.** All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
- (b) **Inspection and repair of stormwater control system.** All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system.
- (c) **Maintenance.** The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the Department, and the maintenance log is being maintained.

Municipalities with separate storm sewer systems regulated under the Maine Pollutant Discharge Elimination System (MPDES) Program may report on all regulated systems under their control as part of their required annual reporting in lieu of separate certification of each system. Municipalities not regulated by the MPDES Program, but that are responsible for maintenance of permitted stormwater systems, may report on multiple stormwater systems in one report.

Duration of Maintenance

Perform maintenance as described.

MAINTENANCE LOG

BABBIDGE FARMS SUBDIVISION WINDHAM, MAINE

The following stormwater management and erosion control items shall be inspected and maintained as prescribed in the Maintenance Plan with recommended frequencies as identified below. The owner is responsible for keeping this maintenance log on file for a minimum of five years and shall provide a copy to the Town and MDEP upon request. Inspections are to be performed by a qualified third party inspector and all corrective actions shall be performed by personnel familiar with stormwater management systems and erosion controls.

Maintenance Item	Maintenance Event	Date Performed	Responsible Personnel	Comments
Vegetated Areas	Inspect slopes and embankments early in Spring.			
Ditches, swales, and other open channels	Inspect after major rainfall event producing 1" of rain in two hours.			
	Inspect for erosion or slumping & repair			
	Mowed at least annually.			
Culverts	Inspect semiannually and after major rainfall.			
	Repair erosion at inlet or outlet of pipe.			
	Repair displaced riprap.			
	Clean accumulated sediment in culverts when >20% full.			
Buffers	Inspect for erosion and channelized flow semiannually.			
	Remove accumulated sediment semiannually.			
	Inspect vegetation cover and reestablish as needed.			

MAINTENANCE LOG

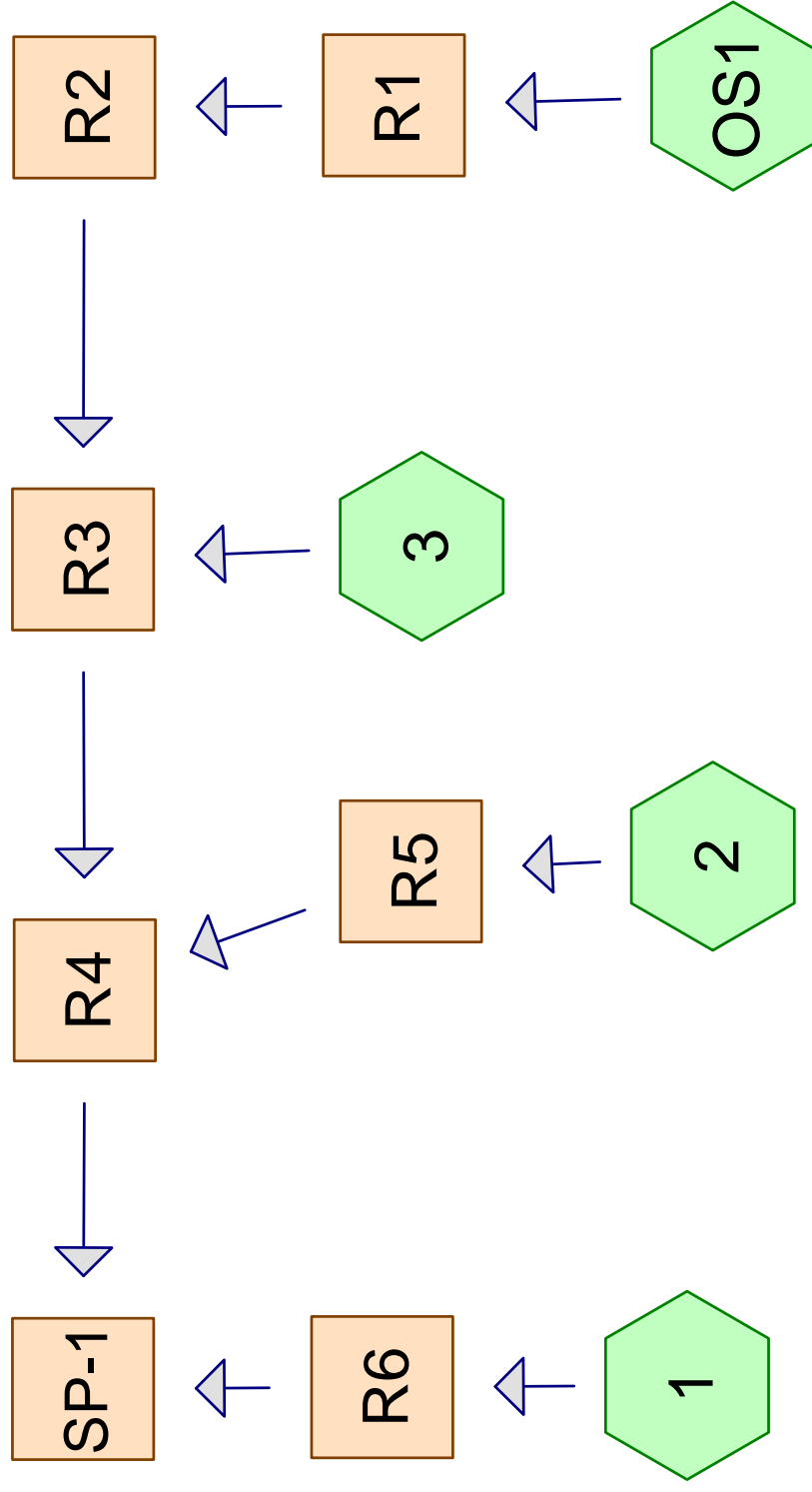
BABBIDGE FARMS SUBDIVISION

WINDHAM, MAINE

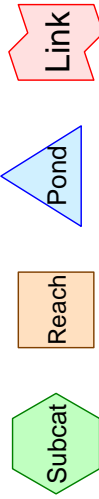
Maintenance Item	Maintenance Event	Date Performed	Responsible Personnel	Comments
Underdrained Filter Basin, Bioretention Cells, And Roofline Dripedges	Check after each rainfall event to ensure that pond drains within 24-48 hours.			
	Replace top several inches of filter if pond does not drain within 72 hours.			
	Mow grass no more than twice a year to no less than 6 inches in height.			
	Inspect semi-annually for erosion or sediment accumulation and repair as necessary.			
Outlet Structure	Inspect to ensure that structure is properly draining.			
	Remove accumulated sediment semiannually.			
	Inspect grates/inlets and remove debris as needed.			
Regular Maintenance	Clear accumulation of winter sand in paved areas annually.			

ATTACHMENT 5

HYDROCAD REPORT



Offsite Watershed



Routing Diagram for 15024-PRE

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15024-PRE*Type III 24-hr 25-Year Rainfall=5.80"*

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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 1: Runoff Area=316,730 sf 3.61% Impervious Runoff Depth>2.87"
Flow Length=902' Tc=30.1 min CN=75 Runoff=14.96 cfs 1.742 af

Subcatchment 2: Runoff Area=263,830 sf 0.00% Impervious Runoff Depth>2.87"
Flow Length=906' Tc=31.4 min CN=75 Runoff=12.21 cfs 1.450 af

Subcatchment 3: Runoff Area=986,590 sf 0.63% Impervious Runoff Depth>2.79"
Flow Length=1,468' Tc=21.9 min CN=74 Runoff=51.80 cfs 5.268 af

Subcatchment OS1: Offsite Watershed Runoff Area=570,265 sf 3.25% Impervious Runoff Depth>2.78"
Flow Length=1,243' Tc=28.3 min CN=74 Runoff=26.78 cfs 3.038 af

Reach R1: Avg. Flow Depth=0.55' Max Vel=7.30 fps Inflow=26.78 cfs 3.038 af
n=0.035 L=835.0' S=0.0910 '/ Capacity=781.82 cfs Outflow=26.59 cfs 3.028 af

Reach R2: Avg. Flow Depth=0.68' Max Vel=3.12 fps Inflow=26.59 cfs 3.028 af
n=0.025 L=672.0' S=0.0060 '/ Capacity=193.62 cfs Outflow=26.17 cfs 3.009 af

Reach R3: Avg. Flow Depth=1.00' Max Vel=3.71 fps Inflow=68.61 cfs 8.277 af
n=0.025 L=321.0' S=0.0050 '/ Capacity=522.37 cfs Outflow=68.29 cfs 8.256 af

Reach R4: Avg. Flow Depth=1.09' Max Vel=3.91 fps Inflow=80.46 cfs 9.705 af
n=0.025 L=338.0' S=0.0050 '/ Capacity=523.19 cfs Outflow=80.16 cfs 9.682 af

Reach R5: Avg. Flow Depth=0.34' Max Vel=5.65 fps Inflow=12.21 cfs 1.450 af
n=0.025 L=79.0' S=0.0500 '/ Capacity=92.45 cfs Outflow=12.20 cfs 1.449 af

Reach R6: Avg. Flow Depth=0.26' Max Vel=4.96 fps Inflow=14.96 cfs 1.742 af
n=0.025 L=90.0' S=0.0500 '/ Capacity=171.12 cfs Outflow=14.92 cfs 1.741 af

Reach SP-1: Inflow=94.95 cfs 11.422 af
Outflow=94.95 cfs 11.422 af

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Summary for Subcatchment 1:

Runoff = 14.96 cfs @ 12.42 hrs, Volume= 1.742 af, Depth> 2.87"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	11,430	98	Pavement
	730	96	Gravel surface, HSG C
	1,900	96	Gravel surface, HSG D
	133,790	70	Woods, Good, HSG C
	168,880	77	Woods, Good, HSG D
	316,730	75	Weighted Average
	305,300		96.39% Pervious Area
	11,430		3.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	150	0.0500	0.12		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
9.2	752	0.0750	1.37		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
30.1	902	Total			

Summary for Subcatchment 2:

Runoff = 12.21 cfs @ 12.44 hrs, Volume= 1.450 af, Depth> 2.87"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
	645	96	Gravel surface, HSG C
	3,465	96	Gravel surface, HSG D
	85,770	70	Woods, Good, HSG C
	173,950	77	Woods, Good, HSG D
	263,830	75	Weighted Average
	263,830		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	150	0.0500	0.12		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
1.4	113	0.0700	1.32		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
6.5	365	0.0350	0.94		Shallow Concentrated Flow, C TO D Woodland Kv= 5.0 fps
2.6	278	0.1300	1.80		Shallow Concentrated Flow, D TO E Woodland Kv= 5.0 fps
31.4	906	Total			

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Summary for Subcatchment 3:

Runoff = 51.80 cfs @ 12.31 hrs, Volume= 5.268 af, Depth> 2.79"

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 25-Year Rainfall=5.80"

Area (sf)	CN	Description
4,450	96	Gravel surface, HSG C
4,630	96	Gravel surface, HSG D
* 6,235	98	Water Surface
440,950	70	Woods, Good, HSG C
530,325	77	Woods, Good, HSG D
986,590	74	Weighted Average
980,355		99.37% Pervious Area
6,235		0.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	150	0.1000	0.16		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
3.8	360	0.1000	1.58		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
0.2	286	0.1000	19.51	819.49	Trap/Vee/Rect Channel Flow, C TO D Bot.W=5.00' D=3.00' Z= 3.0 '/' Top.W=23.00' n= 0.035
2.0	672	0.0060	5.72	194.39	Trap/Vee/Rect Channel Flow, D TO E Bot.W=10.00' D=2.00' Z= 3.0 & 4.0 '/' Top.W=24.00' n= 0.025
21.9	1,468	Total			

Summary for Subcatchment OS1: Offsite Watershed

Runoff = 26.78 cfs @ 12.40 hrs, Volume= 3.038 af, Depth> 2.78"

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 25-Year Rainfall=5.80"

Area (sf)	CN	Description
* 12,645	98	Pavement and Buildings
8,995	96	Gravel surface, HSG C
* 5,910	98	Water Surface
330,105	74	>75% Grass cover, Good, HSG C
212,610	70	Woods, Good, HSG C
570,265	74	Weighted Average
551,710		96.75% Pervious Area
18,555		3.25% Impervious Area

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0850	0.15		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	280	0.0350	0.94		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
6.1	675	0.0700	1.85		Shallow Concentrated Flow, C TO D Short Grass Pasture Kv= 7.0 fps
0.3	138	0.0600	7.75	46.51	Trap/Vee/Rect Channel Flow, D TO E Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00' n= 0.035
28.3	1,243	Total			

Summary for Reach R1:

Inflow Area = 13.091 ac, 3.25% Impervious, Inflow Depth > 2.78" for 25-Year event
Inflow = 26.78 cfs @ 12.40 hrs, Volume= 3.038 af
Outflow = 26.59 cfs @ 12.46 hrs, Volume= 3.028 af, Atten= 1%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.30 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 4.6 min

Peak Storage= 3,050 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 781.82 cfs

5.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 ' Top Width= 23.00'
Length= 835.0' Slope= 0.0910 '
Inlet Invert= 306.00', Outlet Invert= 230.00'

**Summary for Reach R2:**

Inflow Area = 13.091 ac, 3.25% Impervious, Inflow Depth > 2.78" for 25-Year event
Inflow = 26.59 cfs @ 12.46 hrs, Volume= 3.028 af
Outflow = 26.17 cfs @ 12.56 hrs, Volume= 3.009 af, Atten= 2%, Lag= 6.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.12 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 9.1 min

Peak Storage= 5,646 cf @ 12.50 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 2.00' Flow Area= 34.0 sf, Capacity= 193.62 cfs

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10.00' x 2.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 '/' Top Width= 24.00'
Length= 672.0' Slope= 0.0060 '/'
Inlet Invert= 230.00', Outlet Invert= 226.00'

**Summary for Reach R3:**

Inflow Area = 35.740 ac, 1.59% Impervious, Inflow Depth > 2.78" for 25-Year event
Inflow = 68.61 cfs @ 12.38 hrs, Volume= 8.277 af
Outflow = 68.29 cfs @ 12.43 hrs, Volume= 8.256 af, Atten= 0%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.71 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 3.6 min

Peak Storage= 5,937 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.00'
Bank-Full Depth= 3.00' Flow Area= 76.5 sf, Capacity= 522.37 cfs

15.00' x 3.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 '/' Top Width= 36.00'
Length= 321.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.60'

**Summary for Reach R4:**

Inflow Area = 41.797 ac, 1.36% Impervious, Inflow Depth > 2.79" for 25-Year event
Inflow = 80.46 cfs @ 12.43 hrs, Volume= 9.705 af
Outflow = 80.16 cfs @ 12.47 hrs, Volume= 9.682 af, Atten= 0%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.56 fps, Avg. Travel Time= 3.6 min

Peak Storage= 6,955 cf @ 12.45 hrs
Average Depth at Peak Storage= 1.09'
Bank-Full Depth= 3.00' Flow Area= 76.5 sf, Capacity= 523.19 cfs

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15.00' x 3.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 '/' Top Width= 36.00'
Length= 338.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.69'

**Summary for Reach R5:**

Inflow Area = 6.057 ac, 0.00% Impervious, Inflow Depth > 2.87" for 25-Year event
Inflow = 12.21 cfs @ 12.44 hrs, Volume= 1.450 af
Outflow = 12.20 cfs @ 12.45 hrs, Volume= 1.449 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 5.65 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 0.6 min

Peak Storage= 171 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.34'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 92.45 cfs

5.00' x 1.00' deep channel, $n = 0.025$
Side Slope Z-value= 4.0 '/' Top Width= 13.00'
Length= 79.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -3.95'

**Summary for Reach R6:**

Inflow Area = 7.271 ac, 3.61% Impervious, Inflow Depth > 2.87" for 25-Year event
Inflow = 14.96 cfs @ 12.42 hrs, Volume= 1.742 af
Outflow = 14.92 cfs @ 12.43 hrs, Volume= 1.741 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 4.96 fps, Min. Travel Time= 0.3 min
Avg. Velocity = 1.90 fps, Avg. Travel Time= 0.8 min

Peak Storage= 271 cf @ 12.43 hrs
Average Depth at Peak Storage= 0.26'
Bank-Full Depth= 1.00' Flow Area= 16.0 sf, Capacity= 171.12 cfs

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10.00' x 1.00' deep channel, $n = 0.025$
Side Slope Z-value= 6.0 '/' Top Width= 22.00'
Length= 90.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -4.50'

**Summary for Reach SP-1:**

Inflow Area = 49.068 ac, 1.69% Impervious, Inflow Depth > 2.79" for 25-Year event
Inflow = 94.95 cfs @ 12.47 hrs, Volume= 11.422 af
Outflow = 94.95 cfs @ 12.47 hrs, Volume= 11.422 af, Atten= 0%, Lag= 0.0 min

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

15024-PRE

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Type III 24-hr 2-Year Rainfall=3.10"

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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 1: Runoff Area=316,730 sf 3.61% Impervious Runoff Depth>0.93"
Flow Length=902' Tc=30.1 min CN=75 Runoff=4.68 cfs 0.562 af

Subcatchment 2: Runoff Area=263,830 sf 0.00% Impervious Runoff Depth>0.93"
Flow Length=906' Tc=31.4 min CN=75 Runoff=3.83 cfs 0.468 af

Subcatchment 3: Runoff Area=986,590 sf 0.63% Impervious Runoff Depth>0.88"
Flow Length=1,468' Tc=21.9 min CN=74 Runoff=15.61 cfs 1.659 af

Subcatchment OS1: Offsite Watershed Runoff Area=570,265 sf 3.25% Impervious Runoff Depth>0.88"
Flow Length=1,243' Tc=28.3 min CN=74 Runoff=8.10 cfs 0.956 af

Reach R1: Avg. Flow Depth=0.28' Max Vel=4.95 fps Inflow=8.10 cfs 0.956 af
n=0.035 L=835.0' S=0.0910 '/ Capacity=781.82 cfs Outflow=8.05 cfs 0.951 af

Reach R2: Avg. Flow Depth=0.34' Max Vel=2.07 fps Inflow=8.05 cfs 0.951 af
n=0.025 L=672.0' S=0.0060 '/ Capacity=193.62 cfs Outflow=7.81 cfs 0.939 af

Reach R3: Avg. Flow Depth=0.47' Max Vel=2.39 fps Inflow=18.92 cfs 2.599 af
n=0.025 L=321.0' S=0.0050 '/ Capacity=522.37 cfs Outflow=18.87 cfs 2.586 af

Reach R4: Avg. Flow Depth=0.53' Max Vel=2.55 fps Inflow=22.63 cfs 3.054 af
n=0.025 L=338.0' S=0.0050 '/ Capacity=523.19 cfs Outflow=22.57 cfs 3.040 af

Reach R5: Avg. Flow Depth=0.17' Max Vel=3.83 fps Inflow=3.83 cfs 0.468 af
n=0.025 L=79.0' S=0.0500 '/ Capacity=92.45 cfs Outflow=3.82 cfs 0.467 af

Reach R6: Avg. Flow Depth=0.13' Max Vel=3.28 fps Inflow=4.68 cfs 0.562 af
n=0.025 L=90.0' S=0.0500 '/ Capacity=171.12 cfs Outflow=4.67 cfs 0.561 af

Reach SP-1: Inflow=26.99 cfs 3.601 af
Outflow=26.99 cfs 3.601 af

15024-PRE*Type III 24-hr 10-Year Rainfall=4.60"*

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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 1: Runoff Area=316,730 sf 3.61% Impervious Runoff Depth>1.95"
Flow Length=902' Tc=30.1 min CN=75 Runoff=10.14 cfs 1.183 af

Subcatchment 2: Runoff Area=263,830 sf 0.00% Impervious Runoff Depth>1.95"
Flow Length=906' Tc=31.4 min CN=75 Runoff=8.29 cfs 0.985 af

Subcatchment 3: Runoff Area=986,590 sf 0.63% Impervious Runoff Depth>1.88"
Flow Length=1,468' Tc=21.9 min CN=74 Runoff=34.82 cfs 3.554 af

Subcatchment OS1: Offsite Watershed Runoff Area=570,265 sf 3.25% Impervious Runoff Depth>1.88"
Flow Length=1,243' Tc=28.3 min CN=74 Runoff=18.01 cfs 2.049 af

Reach R1: Avg. Flow Depth=0.44' Max Vel=6.45 fps Inflow=18.01 cfs 2.049 af
n=0.035 L=835.0' S=0.0910 '/ Capacity=781.82 cfs Outflow=17.88 cfs 2.041 af

Reach R2: Avg. Flow Depth=0.54' Max Vel=2.73 fps Inflow=17.88 cfs 2.041 af
n=0.025 L=672.0' S=0.0060 '/ Capacity=193.62 cfs Outflow=17.50 cfs 2.025 af

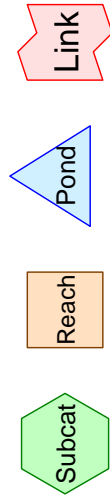
Reach R3: Avg. Flow Depth=0.79' Max Vel=3.22 fps Inflow=45.01 cfs 5.579 af
n=0.025 L=321.0' S=0.0050 '/ Capacity=522.37 cfs Outflow=44.84 cfs 5.562 af

Reach R4: Avg. Flow Depth=0.86' Max Vel=3.41 fps Inflow=53.12 cfs 6.546 af
n=0.025 L=338.0' S=0.0050 '/ Capacity=523.19 cfs Outflow=52.90 cfs 6.526 af

Reach R5: Avg. Flow Depth=0.27' Max Vel=4.98 fps Inflow=8.29 cfs 0.985 af
n=0.025 L=79.0' S=0.0500 '/ Capacity=92.45 cfs Outflow=8.28 cfs 0.985 af

Reach R6: Avg. Flow Depth=0.21' Max Vel=4.34 fps Inflow=10.14 cfs 1.183 af
n=0.025 L=90.0' S=0.0500 '/ Capacity=171.12 cfs Outflow=10.13 cfs 1.183 af

Reach SP-1: Inflow=62.84 cfs 7.709 af
Outflow=62.84 cfs 7.709 af



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15024-POST*Type III 24-hr 25-Year Rainfall=5.80"*

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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 10:	Runoff Area=162,780 sf 9.05% Impervious Runoff Depth>2.97" Flow Length=503' Tc=23.6 min CN=76 Runoff=8.81 cfs 0.926 af
Subcatchment 11:	Runoff Area=27,670 sf 40.51% Impervious Runoff Depth>4.08" Tc=6.0 min CN=87 Runoff=3.07 cfs 0.216 af
Subcatchment 12:	Runoff Area=9,005 sf 15.77% Impervious Runoff Depth>3.67" Tc=6.0 min CN=83 Runoff=0.92 cfs 0.063 af
Subcatchment 13:	Runoff Area=10,555 sf 25.49% Impervious Runoff Depth>3.88" Tc=6.0 min CN=85 Runoff=1.12 cfs 0.078 af
Subcatchment 14:	Runoff Area=153,990 sf 3.91% Impervious Runoff Depth>2.89" Flow Length=489' Tc=18.2 min CN=75 Runoff=9.01 cfs 0.850 af
Subcatchment 20:	Runoff Area=217,295 sf 7.60% Impervious Runoff Depth>3.07" Flow Length=797' Tc=23.0 min CN=77 Runoff=12.27 cfs 1.275 af
Subcatchment 21:	Runoff Area=19,585 sf 25.10% Impervious Runoff Depth>3.67" Tc=6.0 min CN=83 Runoff=1.99 cfs 0.138 af
Subcatchment 22:	Runoff Area=11,300 sf 24.12% Impervious Runoff Depth>3.77" Tc=6.0 min CN=84 Runoff=1.18 cfs 0.082 af
Subcatchment 23:	Runoff Area=8,780 sf 25.00% Impervious Runoff Depth>3.88" Tc=6.0 min CN=85 Runoff=0.93 cfs 0.065 af
Subcatchment 24:	Runoff Area=154,160 sf 0.00% Impervious Runoff Depth>2.88" Flow Length=712' Tc=23.7 min CN=75 Runoff=8.07 cfs 0.850 af
Subcatchment 30:	Runoff Area=142,965 sf 16.58% Impervious Runoff Depth>3.45" Flow Length=624' Tc=25.4 min CN=81 Runoff=8.64 cfs 0.944 af
Subcatchment 31:	Runoff Area=7,965 sf 0.00% Impervious Runoff Depth>3.09" Tc=6.0 min CN=77 Runoff=0.69 cfs 0.047 af
Subcatchment 32:	Runoff Area=71,360 sf 9.08% Impervious Runoff Depth>2.79" Flow Length=290' Tc=25.4 min CN=74 Runoff=3.52 cfs 0.381 af
Subcatchment 33:	Runoff Area=4,710 sf 30.15% Impervious Runoff Depth>3.47" Tc=6.0 min CN=81 Runoff=0.46 cfs 0.031 af
Subcatchment 34:	Runoff Area=31,500 sf 8.21% Impervious Runoff Depth>2.80" Flow Length=220' Tc=11.3 min CN=74 Runoff=2.13 cfs 0.169 af
Subcatchment 35:	Runoff Area=30,975 sf 18.56% Impervious Runoff Depth>3.57" Flow Length=228' Tc=8.1 min CN=82 Runoff=2.89 cfs 0.211 af

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Subcatchment 36:Runoff Area=502,445 sf 1.53% Impervious Runoff Depth>2.79"
Flow Length=1,468' Tc=21.9 min CN=74 Runoff=26.38 cfs 2.683 af**Subcatchment OS1: Offsite Watershed**Runoff Area=570,265 sf 3.25% Impervious Runoff Depth>2.78"
Flow Length=1,243' Tc=28.3 min CN=74 Runoff=26.78 cfs 3.038 af**Reach R1:**Avg. Flow Depth=0.55' Max Vel=7.30 fps Inflow=26.78 cfs 3.038 af
n=0.035 L=835.0' S=0.0910 '/ Capacity=781.82 cfs Outflow=26.59 cfs 3.028 af**Reach R10:**Avg. Flow Depth=0.37' Max Vel=4.98 fps Inflow=7.64 cfs 1.024 af
n=0.035 L=110.0' S=0.0727 '/ Capacity=226.25 cfs Outflow=7.64 cfs 1.024 af**Reach R11:**Avg. Flow Depth=0.02' Max Vel=0.93 fps Inflow=0.87 cfs 0.062 af
n=0.035 L=145.0' S=0.1000 '/ Capacity=219.36 cfs Outflow=0.83 cfs 0.061 af**Reach R12:**Avg. Flow Depth=0.37' Max Vel=5.23 fps Inflow=7.98 cfs 1.085 af
n=0.035 L=290.0' S=0.0810 '/ Capacity=238.83 cfs Outflow=7.97 cfs 1.083 af**Reach R13:**Avg. Flow Depth=0.05' Max Vel=1.75 fps Inflow=1.07 cfs 0.076 af
n=0.035 L=492.0' S=0.0854 '/ Capacity=145.55 cfs Outflow=0.94 cfs 0.075 af**Reach R20: SHEET FLOW THROUGH**Avg. Flow Depth=0.28' Max Vel=0.54 fps Inflow=7.90 cfs 1.314 af
n=0.400 L=150.0' S=0.1267 '/ Capacity=21.60 cfs Outflow=7.89 cfs 1.303 af**Reach R21:**Avg. Flow Depth=0.06' Max Vel=2.40 fps Inflow=7.89 cfs 1.303 af
n=0.035 L=136.0' S=0.1250 '/ Capacity=245.26 cfs Outflow=7.89 cfs 1.301 af**Reach R22:**Avg. Flow Depth=0.03' Max Vel=0.85 fps Inflow=1.13 cfs 0.078 af
n=0.035 L=145.0' S=0.0552 '/ Capacity=162.94 cfs Outflow=1.07 cfs 0.078 af**Reach R23: (new Reach)**Avg. Flow Depth=0.05' Max Vel=1.13 fps Inflow=0.91 cfs 0.063 af
n=0.035 L=196.0' S=0.0408 '/ Capacity=171.03 cfs Outflow=0.85 cfs 0.062 af**Reach R24:**Avg. Flow Depth=0.12' Max Vel=1.42 fps Inflow=1.92 cfs 0.140 af
n=0.035 L=150.0' S=0.0200 '/ Capacity=77.31 cfs Outflow=1.84 cfs 0.140 af**Reach R25:**Avg. Flow Depth=0.03' Max Vel=1.32 fps Inflow=1.84 cfs 0.140 af
n=0.035 L=278.0' S=0.1223 '/ Capacity=242.59 cfs Outflow=1.73 cfs 0.138 af**Reach R3:**Avg. Flow Depth=0.91' Max Vel=3.51 fps Inflow=58.14 cfs 7.383 af
n=0.025 L=321.0' S=0.0050 '/ Capacity=522.37 cfs Outflow=57.97 cfs 7.364 af**Reach R30:**Avg. Flow Depth=0.20' Max Vel=4.33 fps Inflow=5.78 cfs 0.908 af
n=0.035 L=373.0' S=0.1059 '/ Capacity=447.68 cfs Outflow=5.78 cfs 0.906 af**Reach R31:**Avg. Flow Depth=0.11' Max Vel=2.93 fps Inflow=3.52 cfs 0.381 af
n=0.035 L=246.0' S=0.1057 '/ Capacity=210.21 cfs Outflow=3.49 cfs 0.380 af**Reach R32:**Avg. Flow Depth=0.05' Max Vel=2.14 fps Inflow=2.13 cfs 0.169 af
n=0.035 L=180.0' S=0.1528 '/ Capacity=115.59 cfs Outflow=2.07 cfs 0.168 af**Reach R33:**Avg. Flow Depth=0.15' Max Vel=3.42 fps Inflow=2.89 cfs 0.211 af
n=0.035 L=297.0' S=0.0910 '/ Capacity=781.79 cfs Outflow=2.76 cfs 0.211 af

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Reach R34: Avg. Flow Depth=0.64' Max Vel=3.56 fps Inflow=27.69 cfs 3.239 af
n=0.025 L=180.0' S=0.0083 '/' Capacity=229.09 cfs Outflow=27.58 cfs 3.234 af

Reach R35: Avg. Flow Depth=0.84' Max Vel=3.13 fps Inflow=34.22 cfs 4.309 af
n=0.025 L=278.0' S=0.0047 '/' Capacity=171.61 cfs Outflow=34.04 cfs 4.298 af

Reach R36: Avg. Flow Depth=0.80' Max Vel=3.35 fps Inflow=34.26 cfs 4.329 af
n=0.025 L=210.0' S=0.0057 '/' Capacity=189.71 cfs Outflow=34.11 cfs 4.321 af

Reach R37: Avg. Flow Depth=0.01' Max Vel=0.72 fps Inflow=0.44 cfs 0.031 af
n=0.035 L=308.0' S=0.1438 '/' Capacity=263.08 cfs Outflow=0.33 cfs 0.031 af

Reach R4: Avg. Flow Depth=1.04' Max Vel=3.80 fps Inflow=73.92 cfs 9.652 af
n=0.025 L=338.0' S=0.0050 '/' Capacity=523.19 cfs Outflow=73.66 cfs 9.628 af

Reach R5: Avg. Flow Depth=0.41' Max Vel=6.24 fps Inflow=16.75 cfs 2.289 af
n=0.025 L=79.0' S=0.0500 '/' Capacity=92.45 cfs Outflow=16.73 cfs 2.288 af

Reach R6: Avg. Flow Depth=0.28' Max Vel=5.23 fps Inflow=17.50 cfs 2.008 af
n=0.025 L=90.0' S=0.0500 '/' Capacity=171.12 cfs Outflow=17.42 cfs 2.007 af

Reach SP-1: Inflow=88.34 cfs 11.635 af
Outflow=88.34 cfs 11.635 af

Pond BR1: Peak Elev=271.16' Storage=340 cf Inflow=0.92 cfs 0.063 af
Primary=0.04 cfs 0.029 af Secondary=0.83 cfs 0.033 af Outflow=0.87 cfs 0.062 af

Pond BR2: Peak Elev=277.19' Storage=417 cf Inflow=1.12 cfs 0.078 af
Primary=0.05 cfs 0.034 af Secondary=1.02 cfs 0.042 af Outflow=1.07 cfs 0.076 af

Pond BR3: Peak Elev=277.70' Storage=395 cf Inflow=1.18 cfs 0.082 af
Primary=0.04 cfs 0.032 af Secondary=1.09 cfs 0.047 af Outflow=1.13 cfs 0.078 af

Pond BR4: Peak Elev=277.67' Storage=298 cf Inflow=0.93 cfs 0.065 af
Primary=0.03 cfs 0.025 af Secondary=0.88 cfs 0.037 af Outflow=0.91 cfs 0.063 af

Pond BR5: Peak Elev=272.40' Storage=220 cf Inflow=0.46 cfs 0.031 af
Primary=0.03 cfs 0.018 af Secondary=0.41 cfs 0.013 af Outflow=0.44 cfs 0.031 af

Pond CLVT1: Culvert 1 Peak Elev=272.09' Storage=132 cf Inflow=8.81 cfs 0.926 af
Primary=8.81 cfs 0.926 af Secondary=0.00 cfs 0.000 af Outflow=8.81 cfs 0.926 af

Pond CLVT2: Culvert 2 Peak Elev=280.36' Storage=273 cf Inflow=12.27 cfs 1.275 af
Primary=12.23 cfs 1.275 af Secondary=0.00 cfs 0.000 af Outflow=12.23 cfs 1.275 af

Pond CLVT3: Culvert 3 Peak Elev=278.76' Storage=228 cf Inflow=8.64 cfs 0.944 af
Primary=8.62 cfs 0.944 af Secondary=0.00 cfs 0.000 af Outflow=8.62 cfs 0.944 af

Pond FB1: Filter Basin 1 Peak Elev=270.46' Storage=9,600 cf Inflow=10.02 cfs 1.142 af
Primary=7.64 cfs 1.024 af Secondary=0.00 cfs 0.000 af Outflow=7.64 cfs 1.024 af

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Pond FB2: Filter Basin 2

Peak Elev=275.81' Storage=12,435 cf Inflow=13.02 cfs 1.413 af
Primary=7.90 cfs 1.314 af Secondary=0.00 cfs 0.000 af Outflow=7.90 cfs 1.314 af

Pond FB3: Filter Basin 3

Peak Elev=275.96' Storage=8,345 cf Inflow=8.88 cfs 0.991 af
Primary=5.78 cfs 0.908 af Secondary=0.00 cfs 0.000 af Outflow=5.78 cfs 0.908 af

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Type III 24-hr 25-Year Rainfall=5.80"

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Summary for Subcatchment 10:

Runoff = 8.81 cfs @ 12.33 hrs, Volume= 0.926 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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	8,375	98	New Pavement and Driveways
*	1,420	98	New Houses
*	4,930	98	Existing Pavement
*	3,220	96	Existing Gravel
	6,515	74	>75% Grass cover, Good, HSG C
	12,640	80	>75% Grass cover, Good, HSG D
	74,525	70	Woods, Good, HSG C
	51,155	77	Woods, Good, HSG D
	162,780	76	Weighted Average
	148,055		90.95% Pervious Area
	14,725		9.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.9	150	0.0500	0.12		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
1.7	143	0.0750	1.37		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
1.0	210	0.0400	3.33	5.42	Trap/Vee/Rect Channel Flow, C TO D Bot.W=0.00' D=0.50' Z= 10.0 & 3.0 ' Top.W=6.50' n= 0.035
23.6	503	Total			

Summary for Subcatchment 11:

Runoff = 3.07 cfs @ 12.09 hrs, Volume= 0.216 af, Depth> 4.08"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	10,410	98	New Road and Driveways
*	800	98	Existing Road
	16,460	80	>75% Grass cover, Good, HSG D
	27,670	87	Weighted Average
	16,460		59.49% Pervious Area
	11,210		40.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

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Type III 24-hr 25-Year Rainfall=5.80"

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Summary for Subcatchment 12:

Runoff = 0.92 cfs @ 12.09 hrs, Volume= 0.063 af, Depth> 3.67"

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 25-Year Rainfall=5.80"

Area (sf)	CN	Description
7,585	80	>75% Grass cover, Good, HSG D
* 1,420	98	New Building
9,005	83	Weighted Average
7,585		84.23% Pervious Area
1,420		15.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 13:

Runoff = 1.12 cfs @ 12.09 hrs, Volume= 0.078 af, Depth> 3.88"

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 25-Year Rainfall=5.80"

Area (sf)	CN	Description
* 1,270	98	New Driveway
* 1,420	98	New Building
7,865	80	>75% Grass cover, Good, HSG D
10,555	85	Weighted Average
7,865		74.51% Pervious Area
2,690		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 14:

Runoff = 9.01 cfs @ 12.25 hrs, Volume= 0.850 af, Depth> 2.89"

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 25-Year Rainfall=5.80"

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Type III 24-hr 25-Year Rainfall=5.80"

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Area (sf)	CN	Description
* 80	98	New Road and Driveway
* 5,935	98	Existing Pavement
4,800	80	>75% Grass cover, Good, HSG D
74,100	70	Woods, Good, HSG C
69,075	77	Woods, Good, HSG D
153,990	75	Weighted Average
147,975		96.09% Pervious Area
6,015		3.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	114	0.0800	0.14		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
4.3	375	0.0850	1.46		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
18.2	489	Total			

Summary for Subcatchment 20:

Runoff = 12.27 cfs @ 12.32 hrs, Volume= 1.275 af, Depth> 3.07"

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 25-Year Rainfall=5.80"

Area (sf)	CN	Description
* 12,265	98	New Road and Driveways
* 4,260	98	New Buildings
3,030	74	>75% Grass cover, Good, HSG C
29,880	80	>75% Grass cover, Good, HSG D
70,185	70	Woods, Good, HSG C
97,675	77	Woods, Good, HSG D
217,295	77	Weighted Average
200,770		92.40% Pervious Area
16,525		7.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4	150	0.0600	0.13		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
2.1	105	0.0280	0.84		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
0.5	255	0.0150	8.36	677.12	Trap/Vee/Rect Channel Flow, C TO D Bot.W=15.00' D=3.00' Z= 4.0 '/' Top.W=39.00' n= 0.035
0.1	56	0.0700	16.35	883.15	Trap/Vee/Rect Channel Flow, D TO E Bot.W=6.00' D=3.00' Z= 4.0 '/' Top.W=30.00' n= 0.035
0.8	185	0.0100	3.82	137.56	Trap/Vee/Rect Channel Flow, E TO F Bot.W=30.00' D=1.00' Z= 6.0 '/' Top.W=42.00' n= 0.035

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Type III 24-hr 25-Year Rainfall=5.80"

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0.1	46	0.0100	7.19	148.34	Trap/Vee/Rect Channel Flow, F TO G Bot.W=2.00' D=2.50' Z= 2.0 & 3.0 '/' Top.W=14.50' n= 0.025
23.0	797	Total			

Summary for Subcatchment 21:

Runoff = 1.99 cfs @ 12.09 hrs, Volume= 0.138 af, Depth> 3.67"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	4,915	98	New Road and Driveways
	4,795	74	>75% Grass cover, Good, HSG C
	9,875	80	>75% Grass cover, Good, HSG D
	19,585	83	Weighted Average
	14,670		74.90% Pervious Area
	4,915		25.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 22:

Runoff = 1.18 cfs @ 12.09 hrs, Volume= 0.082 af, Depth> 3.77"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,305	98	New Driveway
*	1,420	98	New House
	8,575	80	>75% Grass cover, Good, HSG D
	11,300	84	Weighted Average
	8,575		75.88% Pervious Area
	2,725		24.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 23:

Runoff = 0.93 cfs @ 12.09 hrs, Volume= 0.065 af, Depth> 3.88"

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 25-Year Rainfall=5.80"

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Type III 24-hr 25-Year Rainfall=5.80"

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	Area (sf)	CN	Description
*	775	98	New Driveway
*	1,420	98	New House
	6,585	80	>75% Grass cover, Good, HSG D
	8,780	85	Weighted Average
	6,585		75.00% Pervious Area
	2,195		25.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 24:

Runoff = 8.07 cfs @ 12.33 hrs, Volume= 0.850 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 25-Year Rainfall=5.80"

Area (sf)	CN	Description
1,985	74	>75% Grass cover, Good, HSG C
7,750	80	>75% Grass cover, Good, HSG D
55,670	70	Woods, Good, HSG C
88,755	77	Woods, Good, HSG D
154,160	75	Weighted Average
154,160		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	109	0.0550	0.12		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
5.4	325	0.0400	1.00		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
2.7	278	0.1200	1.73		Shallow Concentrated Flow, C TO D Woodland Kv= 5.0 fps
23.7	712	Total			

Summary for Subcatchment 30:

Runoff = 8.64 cfs @ 12.35 hrs, Volume= 0.944 af, Depth> 3.45"

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 25-Year Rainfall=5.80"

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Type III 24-hr 25-Year Rainfall=5.80"

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	Area (sf)	CN	Description
*	19,450	98	New Road and Driveways
*	4,260	98	New Houses
	3,650	74	>75% Grass cover, Good, HSG C
	35,950	80	>75% Grass cover, Good, HSG D
	79,655	77	Woods, Good, HSG D
	142,965	81	Weighted Average
	119,255		83.42% Pervious Area
	23,710		16.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	110	0.0350	0.10		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
4.6	139	0.0100	0.50		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
0.8	65	0.0700	1.32		Shallow Concentrated Flow, C TO D Woodland Kv= 5.0 fps
1.0	225	0.0100	3.82	137.56	Trap/Vee/Rect Channel Flow, D TO E Bot.W=30.00' D=1.00' Z= 6.0 '/' Top.W=42.00' n= 0.035
0.2	85	0.0100	7.19	148.34	Trap/Vee/Rect Channel Flow, E TO F Bot.W=2.00' D=2.50' Z= 3.0 & 2.0 '/' Top.W=14.50' n= 0.025
25.4	624	Total			

Summary for Subcatchment 31:

Runoff = 0.69 cfs @ 12.09 hrs, Volume= 0.047 af, Depth> 3.09"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
	3,450	74	>75% Grass cover, Good, HSG C
	4,515	80	>75% Grass cover, Good, HSG D
	7,965	77	Weighted Average
	7,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 32:

Runoff = 3.52 cfs @ 12.36 hrs, Volume= 0.381 af, Depth> 2.79"

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 25-Year Rainfall=5.80"

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Type III 24-hr 25-Year Rainfall=5.80"

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	Area (sf)	CN	Description
*	3,640	98	New Driveways
*	2,840	98	New Houses
	25,745	74	>75% Grass cover, Good, HSG C
	1,290	80	>75% Grass cover, Good, HSG D
	37,845	70	Woods, Good, HSG C
	71,360	74	Weighted Average
	64,880		90.92% Pervious Area
	6,480		9.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0250	0.16		Sheet Flow, A TO B Grass: Short n= 0.150 P2= 3.10"
12.5	56	0.0250	0.07		Sheet Flow, B TO C Woods: Light underbrush n= 0.400 P2= 3.10"
6.2	44	0.0900	0.12		Sheet Flow, B TO C Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	140	0.1000	1.58		Shallow Concentrated Flow, D TO E Woodland Kv= 5.0 fps
25.4	290	Total			

Summary for Subcatchment 33:

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.031 af, Depth> 3.47"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	1,420	98	New House
	3,290	74	>75% Grass cover, Good, HSG C
	4,710	81	Weighted Average
	3,290		69.85% Pervious Area
	1,420		30.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, 6 MINUTE MIN. TC

Summary for Subcatchment 34:

Runoff = 2.13 cfs @ 12.16 hrs, Volume= 0.169 af, Depth> 2.80"

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 25-Year Rainfall=5.80"

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Type III 24-hr 25-Year Rainfall=5.80"

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	Area (sf)	CN	Description
*	1,165	98	New Driveway
*	1,420	98	New House
	11,340	74	>75% Grass cover, Good, HSG C
	17,575	70	Woods, Good, HSG C
	31,500	74	Weighted Average
	28,915		91.79% Pervious Area
	2,585		8.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	106	0.1200	0.35		Sheet Flow, A TO B Grass: Short n= 0.150 P2= 3.10"
5.5	44	0.1200	0.13		Sheet Flow, B TO C Woods: Light underbrush n= 0.400 P2= 3.10"
0.7	70	0.1000	1.58		Shallow Concentrated Flow, C TO D Woodland Kv= 5.0 fps
11.3	220	Total			

Summary for Subcatchment 35:

Runoff = 2.89 cfs @ 12.11 hrs, Volume= 0.211 af, Depth> 3.57"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	2,910	98	New Road and Driveways
*	2,840	98	New Houses
	14,315	80	>75% Grass cover, Good, HSG D
	1,625	70	Woods, Good, HSG C
	9,285	77	Woods, Good, HSG D
	30,975	82	Weighted Average
	25,225		81.44% Pervious Area
	5,750		18.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9	118	0.0700	0.29		Sheet Flow, A TO B Grass: Short n= 0.150 P2= 3.10"
1.2	110	0.0900	1.50		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
8.1	228	Total			

Summary for Subcatchment 36:

Runoff = 26.38 cfs @ 12.31 hrs, Volume= 2.683 af, Depth> 2.79"

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 25-Year Rainfall=5.80"

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Type III 24-hr 25-Year Rainfall=5.80"

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	Area (sf)	CN	Description
*	1,435	98	New Road and Driveways
*	1,120	96	Existing Gravel Road C
*	1,810	96	Existing Gravel Road D
*	6,235	98	Water Surface
	7,710	74	>75% Grass cover, Good, HSG C
	9,355	80	>75% Grass cover, Good, HSG D
	237,510	70	Woods, Good, HSG C
	237,270	77	Woods, Good, HSG D
	502,445	74	Weighted Average
	494,775		98.47% Pervious Area
	7,670		1.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.9	150	0.1000	0.16		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
3.8	360	0.1000	1.58		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
0.2	286	0.1000	27.32	1,147.29	Trap/Vee/Rect Channel Flow, C TO D Bot.W=5.00' D=3.00' Z= 3.0 '/' Top.W=23.00' n= 0.025
2.0	672	0.0060	5.72	194.39	Trap/Vee/Rect Channel Flow, D TO E Bot.W=10.00' D=2.00' Z= 3.0 & 4.0 '/' Top.W=24.00' n= 0.025
21.9	1,468	Total			

Summary for Subcatchment OS1: Offsite Watershed

Runoff = 26.78 cfs @ 12.40 hrs, Volume= 3.038 af, Depth> 2.78"

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 25-Year Rainfall=5.80"

	Area (sf)	CN	Description
*	12,645	98	Pavement and Buildings
	8,995	96	Gravel surface, HSG C
*	5,910	98	Water Surface
	330,105	74	>75% Grass cover, Good, HSG C
	212,610	70	Woods, Good, HSG C
	570,265	74	Weighted Average
	551,710		96.75% Pervious Area
	18,555		3.25% Impervious Area

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Type III 24-hr 25-Year Rainfall=5.80"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9	150	0.0850	0.15		Sheet Flow, A TO B Woods: Light underbrush n= 0.400 P2= 3.10"
5.0	280	0.0350	0.94		Shallow Concentrated Flow, B TO C Woodland Kv= 5.0 fps
6.1	675	0.0700	1.85		Shallow Concentrated Flow, C TO D Short Grass Pasture Kv= 7.0 fps
0.3	138	0.0600	7.75	46.51	Trap/Vee/Rect Channel Flow, D TO E Bot.W=3.00' D=1.00' Z= 3.0 ' Top.W=9.00' n= 0.035
28.3	1,243	Total			

Summary for Reach R1:

Inflow Area = 13.091 ac, 3.25% Impervious, Inflow Depth > 2.78" for 25-Year event
Inflow = 26.78 cfs @ 12.40 hrs, Volume= 3.038 af
Outflow = 26.59 cfs @ 12.46 hrs, Volume= 3.028 af, Atten= 1%, Lag= 3.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 7.30 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 2.99 fps, Avg. Travel Time= 4.6 min

Peak Storage= 3,050 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.55'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 781.82 cfs

5.00' x 3.00' deep channel, n= 0.035
Side Slope Z-value= 3.0 ' Top Width= 23.00'
Length= 835.0' Slope= 0.0910 '
Inlet Invert= 306.00', Outlet Invert= 230.00'

**Summary for Reach R10:**

Inflow Area = 4.372 ac, 13.62% Impervious, Inflow Depth > 2.81" for 25-Year event
Inflow = 7.64 cfs @ 12.51 hrs, Volume= 1.024 af
Outflow = 7.64 cfs @ 12.53 hrs, Volume= 1.024 af, Atten= 0%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.98 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.84 fps, Avg. Travel Time= 1.0 min

Peak Storage= 169 cf @ 12.53 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 226.25 cfs

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Type III 24-hr 25-Year Rainfall=5.80"

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3.00' x 2.00' deep channel, $n = 0.035$
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 110.0' Slope= 0.0727 '/'
Inlet Invert= 265.50', Outlet Invert= 257.50'

**Summary for Reach R11:**

Inflow Area = 0.207 ac, 15.77% Impervious, Inflow Depth > 3.57" for 25-Year event
Inflow = 0.87 cfs @ 12.12 hrs, Volume= 0.062 af
Outflow = 0.83 cfs @ 12.19 hrs, Volume= 0.061 af, Atten= 5%, Lag= 4.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 0.93 fps, Min. Travel Time= 2.6 min
Avg. Velocity= 0.41 fps, Avg. Travel Time= 5.9 min

Peak Storage= 131 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 219.36 cfs

50.00' x 0.50' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 '/' Top Width= 60.00'
Length= 145.0' Slope= 0.1000 '/'
Inlet Invert= 272.00', Outlet Invert= 257.50'

**Summary for Reach R12:**

Inflow Area = 4.579 ac, 13.71% Impervious, Inflow Depth > 2.84" for 25-Year event
Inflow = 7.98 cfs @ 12.45 hrs, Volume= 1.085 af
Outflow = 7.97 cfs @ 12.43 hrs, Volume= 1.083 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 5.23 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 1.95 fps, Avg. Travel Time= 2.5 min

Peak Storage= 441 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.37'
Bank-Full Depth= 2.00' Flow Area= 18.0 sf, Capacity= 238.83 cfs

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Type III 24-hr 25-Year Rainfall=5.80"

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3.00' x 2.00' deep channel, $n = 0.035$
Side Slope Z-value= 3.0 '/' Top Width= 15.00'
Length= 290.0' Slope= 0.0810 '/'
Inlet Invert= 257.50', Outlet Invert= 234.00'

**Summary for Reach R13:**

Inflow Area = 0.242 ac, 25.49% Impervious, Inflow Depth > 3.75" for 25-Year event
Inflow = 1.07 cfs @ 12.12 hrs, Volume= 0.076 af
Outflow = 0.94 cfs @ 12.25 hrs, Volume= 0.075 af, Atten= 12%, Lag= 7.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 1.75 fps, Min. Travel Time= 4.7 min
Avg. Velocity= 0.64 fps, Avg. Travel Time= 12.9 min

Peak Storage= 271 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00' Flow Area= 14.0 sf, Capacity= 145.55 cfs

10.00' x 1.00' deep channel, $n = 0.035$
Side Slope Z-value= 4.0 '/' Top Width= 18.00'
Length= 492.0' Slope= 0.0854 '/'
Inlet Invert= 276.00', Outlet Invert= 234.00'

**Summary for Reach R20: SHEET FLOW THROUGH BUFFER**

Inflow Area = 5.438 ac, 9.05% Impervious, Inflow Depth > 2.90" for 25-Year event
Inflow = 7.90 cfs @ 12.61 hrs, Volume= 1.314 af
Outflow = 7.89 cfs @ 12.74 hrs, Volume= 1.303 af, Atten= 0%, Lag= 7.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 0.54 fps, Min. Travel Time= 4.6 min
Avg. Velocity= 0.19 fps, Avg. Travel Time= 13.0 min

Peak Storage= 2,186 cf @ 12.66 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 21.60 cfs

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50.00' x 0.50' deep channel, n= 0.400 Sheet flow: Woods+light brush

Side Slope Z-value= 10.0 '/' Top Width= 60.00'

Length= 150.0' Slope= 0.1267 '/'

Inlet Invert= 268.00', Outlet Invert= 249.00'

**Summary for Reach R21:**

Inflow Area = 5.438 ac, 9.05% Impervious, Inflow Depth > 2.88" for 25-Year event
Inflow = 7.89 cfs @ 12.74 hrs, Volume= 1.303 af
Outflow = 7.89 cfs @ 12.76 hrs, Volume= 1.301 af, Atten= 0%, Lag= 1.6 min

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

Max. Velocity= 2.40 fps, Min. Travel Time= 0.9 min

Avg. Velocity = 0.90 fps, Avg. Travel Time= 2.5 min

Peak Storage= 447 cf @ 12.75 hrs

Average Depth at Peak Storage= 0.06'

Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 245.26 cfs

50.00' x 0.50' deep channel, n= 0.035

Side Slope Z-value= 10.0 '/' Top Width= 60.00'

Length= 136.0' Slope= 0.1250 '/'

Inlet Invert= 249.00', Outlet Invert= 232.00'

**Summary for Reach R22:**

Inflow Area = 0.259 ac, 24.12% Impervious, Inflow Depth > 3.63" for 25-Year event
Inflow = 1.13 cfs @ 12.11 hrs, Volume= 0.078 af
Outflow = 1.07 cfs @ 12.20 hrs, Volume= 0.078 af, Atten= 5%, Lag= 4.9 min

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

Max. Velocity= 0.85 fps, Min. Travel Time= 2.8 min

Avg. Velocity = 0.32 fps, Avg. Travel Time= 7.6 min

Peak Storage= 183 cf @ 12.15 hrs

Average Depth at Peak Storage= 0.03'

Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 162.94 cfs

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50.00' x 0.50' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 '/' Top Width= 60.00'
Length= 145.0' Slope= 0.0552 '/'
Inlet Invert= 277.00', Outlet Invert= 269.00'



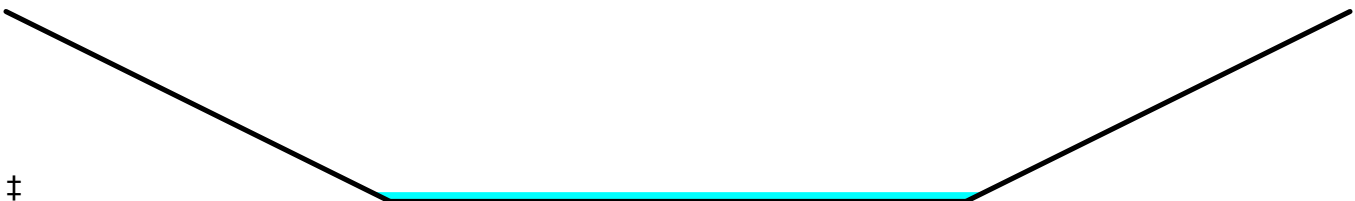
Summary for Reach R23: (new Reach)

Inflow Area = 0.202 ac, 25.00% Impervious, Inflow Depth > 3.73" for 25-Year event
Inflow = 0.91 cfs @ 12.11 hrs, Volume= 0.063 af
Outflow = 0.85 cfs @ 12.19 hrs, Volume= 0.062 af, Atten= 6%, Lag= 5.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 1.13 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 7.6 min

Peak Storage= 149 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00' Flow Area= 25.0 sf, Capacity= 171.03 cfs

15.00' x 1.00' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 '/' Top Width= 35.00'
Length= 196.0' Slope= 0.0408 '/'
Inlet Invert= 277.00', Outlet Invert= 269.00'



Summary for Reach R24:

Inflow Area = 0.461 ac, 24.50% Impervious, Inflow Depth > 3.65" for 25-Year event
Inflow = 1.92 cfs @ 12.19 hrs, Volume= 0.140 af
Outflow = 1.84 cfs @ 12.25 hrs, Volume= 0.140 af, Atten= 4%, Lag= 3.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 1.42 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 5.9 min

Peak Storage= 199 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 1.00' Flow Area= 16.0 sf, Capacity= 77.31 cfs

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10.00' x 1.00' deep channel, $n = 0.035$
Side Slope Z-value= 6.0 '/' Top Width= 22.00'
Length= 150.0' Slope= 0.0200 '/'
Inlet Invert= 269.00', Outlet Invert= 266.00'

**Summary for Reach R25:**

Inflow Area = 0.461 ac, 24.50% Impervious, Inflow Depth > 3.63" for 25-Year event
Inflow = 1.84 cfs @ 12.25 hrs, Volume= 0.140 af
Outflow = 1.73 cfs @ 12.34 hrs, Volume= 0.138 af, Atten= 6%, Lag= 5.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 1.32 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 9.6 min

Peak Storage= 369 cf @ 12.29 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 242.59 cfs

50.00' x 0.50' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 '/' Top Width= 60.00'
Length= 278.0' Slope= 0.1223 '/'
Inlet Invert= 266.00', Outlet Invert= 232.00'

**Summary for Reach R3:**

Inflow Area = 31.271 ac, 4.86% Impervious, Inflow Depth > 2.83" for 25-Year event
Inflow = 58.14 cfs @ 12.43 hrs, Volume= 7.383 af
Outflow = 57.97 cfs @ 12.47 hrs, Volume= 7.364 af, Atten= 0%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 3.51 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.30 fps, Avg. Travel Time= 4.1 min

Peak Storage= 5,311 cf @ 12.44 hrs
Average Depth at Peak Storage= 0.91'
Bank-Full Depth= 3.00' Flow Area= 76.5 sf, Capacity= 522.37 cfs

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15.00' x 3.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 ' ' Top Width= 36.00'
Length= 321.0' Slope= 0.0050 ' '
Inlet Invert= 0.00', Outlet Invert= -1.60'

**Summary for Reach R30:**

Inflow Area = 3.465 ac, 15.71% Impervious, Inflow Depth > 3.14" for 25-Year event
Inflow = 5.78 cfs @ 12.63 hrs, Volume= 0.908 af
Outflow = 5.78 cfs @ 12.67 hrs, Volume= 0.906 af, Atten= 0%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 4.33 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.74 fps, Avg. Travel Time= 3.6 min

Peak Storage= 498 cf @ 12.65 hrs
Average Depth at Peak Storage= 0.20'
Bank-Full Depth= 2.00' Flow Area= 28.0 sf, Capacity= 447.68 cfs

6.00' x 2.00' deep channel, $n = 0.035$
Side Slope Z-value= 4.0 ' ' Top Width= 22.00'
Length= 373.0' Slope= 0.1059 ' '
Inlet Invert= 268.00', Outlet Invert= 228.50'

**Summary for Reach R31:**

Inflow Area = 1.638 ac, 9.08% Impervious, Inflow Depth > 2.79" for 25-Year event
Inflow = 3.52 cfs @ 12.36 hrs, Volume= 0.381 af
Outflow = 3.49 cfs @ 12.40 hrs, Volume= 0.380 af, Atten= 1%, Lag= 2.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 2.93 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.13 fps, Avg. Travel Time= 3.6 min

Peak Storage= 294 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 1.00' Flow Area= 20.0 sf, Capacity= 210.21 cfs

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10.00' x 1.00' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 ' ' Top Width= 30.00'
Length= 246.0' Slope= 0.1057 ' '
Inlet Invert= 254.00', Outlet Invert= 228.00'



Summary for Reach R32:

Inflow Area = 0.723 ac, 8.21% Impervious, Inflow Depth > 2.80" for 25-Year event
Inflow = 2.13 cfs @ 12.16 hrs, Volume= 0.169 af
Outflow = 2.07 cfs @ 12.20 hrs, Volume= 0.168 af, Atten= 3%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 2.14 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 0.71 fps, Avg. Travel Time= 4.2 min

Peak Storage= 176 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50' Flow Area= 12.5 sf, Capacity= 115.59 cfs

20.00' x 0.50' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 ' ' Top Width= 30.00'
Length= 180.0' Slope= 0.1528 ' '
Inlet Invert= 256.00', Outlet Invert= 228.50'



Summary for Reach R33:

Inflow Area = 0.711 ac, 18.56% Impervious, Inflow Depth > 3.57" for 25-Year event
Inflow = 2.89 cfs @ 12.11 hrs, Volume= 0.211 af
Outflow = 2.76 cfs @ 12.16 hrs, Volume= 0.211 af, Atten= 5%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 3.42 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.34 fps, Avg. Travel Time= 3.7 min

Peak Storage= 245 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 3.00' Flow Area= 42.0 sf, Capacity= 781.79 cfs

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5.00' x 3.00' deep channel, $n = 0.035$
Side Slope Z-value= 3.0 '/' Top Width= 23.00'
Length= 297.0' Slope= 0.0910 '/'
Inlet Invert= 0.00', Outlet Invert= -27.03'

**Summary for Reach R34:**

Inflow Area = 13.803 ac, 4.04% Impervious, Inflow Depth > 2.82" for 25-Year event
Inflow = 27.69 cfs @ 12.45 hrs, Volume= 3.239 af
Outflow = 27.58 cfs @ 12.47 hrs, Volume= 3.234 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 3.56 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 1.26 fps, Avg. Travel Time= 2.4 min

Peak Storage= 1,400 cf @ 12.46 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 2.00' Flow Area= 34.0 sf, Capacity= 229.09 cfs

10.00' x 2.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 '/' Top Width= 24.00'
Length= 180.0' Slope= 0.0083 '/'
Inlet Invert= 230.00', Outlet Invert= 228.50'

**Summary for Reach R35:**

Inflow Area = 17.991 ac, 6.46% Impervious, Inflow Depth > 2.87" for 25-Year event
Inflow = 34.22 cfs @ 12.47 hrs, Volume= 4.309 af
Outflow = 34.04 cfs @ 12.51 hrs, Volume= 4.298 af, Atten= 1%, Lag= 2.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 3.13 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.16 fps, Avg. Travel Time= 4.0 min

Peak Storage= 3,033 cf @ 12.49 hrs
Average Depth at Peak Storage= 0.84'
Bank-Full Depth= 2.00' Flow Area= 34.0 sf, Capacity= 171.61 cfs

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10.00' x 2.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 ' ' Top Width= 24.00'
Length= 278.0' Slope= 0.0047 ' '
Inlet Invert= 228.50', Outlet Invert= 227.20'

**Summary for Reach R36:**

Inflow Area = 18.099 ac, 6.60% Impervious, Inflow Depth > 2.87" for 25-Year event
Inflow = 34.26 cfs @ 12.51 hrs, Volume= 4.329 af
Outflow = 34.11 cfs @ 12.54 hrs, Volume= 4.321 af, Atten= 0%, Lag= 1.8 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 3.35 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.24 fps, Avg. Travel Time= 2.8 min

Peak Storage= 2,143 cf @ 12.52 hrs
Average Depth at Peak Storage= 0.80'
Bank-Full Depth= 2.00' Flow Area= 34.0 sf, Capacity= 189.71 cfs

10.00' x 2.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 ' ' Top Width= 24.00'
Length= 210.0' Slope= 0.0057 ' '
Inlet Invert= 227.20', Outlet Invert= 226.00'

**Summary for Reach R37:**

Inflow Area = 0.108 ac, 30.15% Impervious, Inflow Depth > 3.43" for 25-Year event
Inflow = 0.44 cfs @ 12.11 hrs, Volume= 0.031 af
Outflow = 0.33 cfs @ 12.32 hrs, Volume= 0.031 af, Atten= 26%, Lag= 12.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 0.72 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 10.8 min

Peak Storage= 141 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.01'
Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 263.08 cfs

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50.00' x 0.50' deep channel, $n = 0.035$
Side Slope Z-value= 10.0 '/' Top Width= 60.00'
Length= 308.0' Slope= 0.1438 '/'
Inlet Invert= 272.30', Outlet Invert= 228.00'

**Summary for Reach R4:**

Inflow Area = 40.709 ac, 5.22% Impervious, Inflow Depth > 2.85" for 25-Year event
Inflow = 73.92 cfs @ 12.45 hrs, Volume= 9.652 af
Outflow = 73.66 cfs @ 12.49 hrs, Volume= 9.628 af, Atten= 0%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 3.80 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 4.1 min

Peak Storage= 6,569 cf @ 12.46 hrs
Average Depth at Peak Storage= 1.04'
Bank-Full Depth= 3.00' Flow Area= 76.5 sf, Capacity= 523.19 cfs

15.00' x 3.00' deep channel, $n = 0.025$
Side Slope Z-value= 3.0 4.0 '/' Top Width= 36.00'
Length= 338.0' Slope= 0.0050 '/'
Inlet Invert= 0.00', Outlet Invert= -1.69'

**Summary for Reach R5:**

Inflow Area = 9.438 ac, 6.41% Impervious, Inflow Depth > 2.91" for 25-Year event
Inflow = 16.75 cfs @ 12.36 hrs, Volume= 2.289 af
Outflow = 16.73 cfs @ 12.37 hrs, Volume= 2.288 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 6.24 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 2.31 fps, Avg. Travel Time= 0.6 min

Peak Storage= 212 cf @ 12.37 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 1.00' Flow Area= 9.0 sf, Capacity= 92.45 cfs

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5.00' x 1.00' deep channel, $n = 0.025$
Side Slope Z-value= 4.0 '/' Top Width= 13.00'
Length= 79.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -3.95'

**Summary for Reach R6:**

Inflow Area = 8.356 ac, 9.91% Impervious, Inflow Depth > 2.88" for 25-Year event
Inflow = 17.50 cfs @ 12.27 hrs, Volume= 2.008 af
Outflow = 17.42 cfs @ 12.28 hrs, Volume= 2.007 af, Atten= 0%, Lag= 0.6 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, $dt = 0.05$ hrs
Max. Velocity= 5.23 fps, Min. Travel Time= 0.3 min
Avg. Velocity= 1.72 fps, Avg. Travel Time= 0.9 min

Peak Storage= 300 cf @ 12.28 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 1.00' Flow Area= 16.0 sf, Capacity= 171.12 cfs

10.00' x 1.00' deep channel, $n = 0.025$
Side Slope Z-value= 6.0 '/' Top Width= 22.00'
Length= 90.0' Slope= 0.0500 '/'
Inlet Invert= 0.00', Outlet Invert= -4.50'

**Summary for Reach SP-1:**

Inflow Area = 49.066 ac, 6.02% Impervious, Inflow Depth > 2.85" for 25-Year event
Inflow = 88.34 cfs @ 12.46 hrs, Volume= 11.635 af
Outflow = 88.34 cfs @ 12.46 hrs, Volume= 11.635 af, Atten= 0%, Lag= 0.0 min

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

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Summary for Pond BR1:

Inflow Area = 0.207 ac, 15.77% Impervious, Inflow Depth > 3.67" for 25-Year event
 Inflow = 0.92 cfs @ 12.09 hrs, Volume= 0.063 af
 Outflow = 0.87 cfs @ 12.12 hrs, Volume= 0.062 af, Atten= 5%, Lag= 1.6 min
 Primary = 0.04 cfs @ 12.12 hrs, Volume= 0.029 af
 Secondary = 0.83 cfs @ 12.12 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.16' @ 12.12 hrs Surf.Area= 753 sf Storage= 340 cf

Plug-Flow detention time= 39.0 min calculated for 0.062 af (97% of inflow)
 Center-of-Mass det. time= 28.2 min (803.3 - 775.1)

Volume	Invert	Avail.Storage	Storage Description
#1	270.50'	1,223 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.50	270	0	0
272.00	1,360	1,223	1,223

Device	Routing	Invert	Outlet Devices
#1	Primary	270.50'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	271.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.04 cfs @ 12.12 hrs HW=271.16' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.04 cfs)

Secondary OutFlow Max=0.81 cfs @ 12.12 hrs HW=271.16' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.81 cfs @ 1.00 fps)

Summary for Pond BR2:

Inflow Area = 0.242 ac, 25.49% Impervious, Inflow Depth > 3.88" for 25-Year event
 Inflow = 1.12 cfs @ 12.09 hrs, Volume= 0.078 af
 Outflow = 1.07 cfs @ 12.12 hrs, Volume= 0.076 af, Atten= 5%, Lag= 1.6 min
 Primary = 0.05 cfs @ 12.12 hrs, Volume= 0.034 af
 Secondary = 1.02 cfs @ 12.12 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 277.19' @ 12.12 hrs Surf.Area= 815 sf Storage= 417 cf

Plug-Flow detention time= 39.6 min calculated for 0.076 af (97% of inflow)
 Center-of-Mass det. time= 27.1 min (797.3 - 770.3)

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Volume	Invert	Avail.Storage	Storage Description
#1	276.50'	1,279 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
276.50	395	0	0
278.00	1,310	1,279	1,279

Device	Routing	Invert	Outlet Devices
#1	Primary	276.50'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	277.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.05 cfs @ 12.12 hrs HW=277.19' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.05 cfs)**Secondary OutFlow** Max=0.99 cfs @ 12.12 hrs HW=277.19' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.99 cfs @ 1.07 fps)**Summary for Pond BR3:**

Inflow Area = 0.259 ac, 24.12% Impervious, Inflow Depth > 3.77" for 25-Year event
 Inflow = 1.18 cfs @ 12.09 hrs, Volume= 0.082 af
 Outflow = 1.13 cfs @ 12.11 hrs, Volume= 0.078 af, Atten= 4%, Lag= 1.4 min
 Primary = 0.04 cfs @ 12.11 hrs, Volume= 0.032 af
 Secondary = 1.09 cfs @ 12.11 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 277.70' @ 12.11 hrs Surf.Area= 729 sf Storage= 395 cf

Plug-Flow detention time= 37.4 min calculated for 0.078 af (96% of inflow)
 Center-of-Mass det. time= 22.4 min (795.1 - 772.8)

Volume	Invert	Avail.Storage	Storage Description
#1	277.00'	638 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
277.00	405	0	0
278.00	870	638	638

Device	Routing	Invert	Outlet Devices
#1	Primary	277.00'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	277.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

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Primary OutFlow Max=0.04 cfs @ 12.11 hrs HW=277.69' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)**Secondary OutFlow** Max=1.06 cfs @ 12.11 hrs HW=277.69' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 1.06 cfs @ 1.10 fps)**Summary for Pond BR4:**

Inflow Area = 0.202 ac, 25.00% Impervious, Inflow Depth > 3.88" for 25-Year event
 Inflow = 0.93 cfs @ 12.09 hrs, Volume= 0.065 af
 Outflow = 0.91 cfs @ 12.11 hrs, Volume= 0.063 af, Atten= 3%, Lag= 1.2 min
 Primary = 0.03 cfs @ 12.11 hrs, Volume= 0.025 af
 Secondary = 0.88 cfs @ 12.11 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 277.67' @ 12.11 hrs Surf.Area= 578 sf Storage= 298 cf

Plug-Flow detention time= 36.9 min calculated for 0.063 af (96% of inflow)
 Center-of-Mass det. time= 22.5 min (792.7 - 770.3)

Volume	Invert	Avail.Storage	Storage Description
#1	277.00'	510 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
277.00	310	0	0
278.00	710	510	510

Device	Routing	Invert	Outlet Devices
#1	Primary	277.00'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	277.50'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.03 cfs @ 12.11 hrs HW=277.67' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Secondary OutFlow** Max=0.86 cfs @ 12.11 hrs HW=277.67' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.86 cfs @ 1.02 fps)**Summary for Pond BR5:**

Inflow Area = 0.108 ac, 30.15% Impervious, Inflow Depth > 3.47" for 25-Year event
 Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.031 af
 Outflow = 0.44 cfs @ 12.11 hrs, Volume= 0.031 af, Atten= 3%, Lag= 1.4 min
 Primary = 0.03 cfs @ 12.11 hrs, Volume= 0.018 af
 Secondary = 0.41 cfs @ 12.11 hrs, Volume= 0.013 af

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

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Peak Elev= 272.40' @ 12.11 hrs Surf.Area= 492 sf Storage= 220 cf

Plug-Flow detention time= 47.8 min calculated for 0.031 af (99% of inflow)

Center-of-Mass det. time= 43.4 min (823.0 - 779.7)

Volume	Invert	Avail.Storage	Storage Description
#1	271.80'	588 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
271.80	240	0	0
272.00	320	56	56
273.00	745	533	588

Device	Routing	Invert	Outlet Devices
#1	Primary	271.80'	2.410 in/hr Exfiltration over Surface area
#2	Secondary	272.30'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.03 cfs @ 12.11 hrs HW=272.40' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Secondary OutFlow** Max=0.40 cfs @ 12.11 hrs HW=272.40' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.40 cfs @ 0.79 fps)**Summary for Pond CLVT1: Culvert 1**

Inflow Area = 3.737 ac, 9.05% Impervious, Inflow Depth > 2.97" for 25-Year event
 Inflow = 8.81 cfs @ 12.33 hrs, Volume= 0.926 af
 Outflow = 8.81 cfs @ 12.33 hrs, Volume= 0.926 af, Atten= 0%, Lag= 0.3 min
 Primary = 8.81 cfs @ 12.33 hrs, Volume= 0.926 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= 272.09' @ 12.33 hrs Surf.Area= 146 sf Storage= 132 cf

Plug-Flow detention time= 0.3 min calculated for 0.926 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (804.1 - 803.9)

Volume	Invert	Avail.Storage	Storage Description
#1	270.40'	3,353 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
270.40	10	0	0
274.00	300	558	558
276.00	2,495	2,795	3,353

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Device	Routing	Invert	Outlet Devices
#1	Primary	270.40'	24.0" Round Culvert L= 53.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 270.40' / 270.15' S= 0.0047 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	274.70'	10.0' long x 29.0' breadth Roadway Surface Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.77 cfs @ 12.33 hrs HW=272.08' (Free Discharge)↑**1=Culvert** (Barrel Controls 8.77 cfs @ 4.19 fps)**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=270.40' (Free Discharge)↑**2=Roadway Surface** (Controls 0.00 cfs)**Summary for Pond CLVT2: Culvert 2**

Inflow Area = 4.988 ac, 7.60% Impervious, Inflow Depth > 3.07" for 25-Year event
 Inflow = 12.27 cfs @ 12.32 hrs, Volume= 1.275 af
 Outflow = 12.23 cfs @ 12.33 hrs, Volume= 1.275 af, Atten= 0%, Lag= 0.9 min
 Primary = 12.23 cfs @ 12.33 hrs, Volume= 1.275 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= 280.36' @ 12.33 hrs Surf.Area= 405 sf Storage= 273 cf

Plug-Flow detention time= 0.3 min calculated for 1.275 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (801.7 - 801.5)

Volume	Invert	Avail.Storage	Storage Description
#1	278.25'	61,441 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
278.25	10	0	0
280.00	180	166	166
281.00	800	490	656
282.00	35,385	18,093	18,749
283.00	50,000	42,693	61,441

Device	Routing	Invert	Outlet Devices
#1	Primary	278.25'	24.0" Round Culvert L= 51.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 278.25' / 278.00' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	282.50'	10.0' long x 29.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

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Type III 24-hr 25-Year Rainfall=5.80"

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Primary OutFlow Max=12.17 cfs @ 12.33 hrs HW=280.35' (Free Discharge)↑**1=Culvert** (Barrel Controls 12.17 cfs @ 4.57 fps)**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=278.25' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond CLVT3: Culvert 3**

Inflow Area = 3.282 ac, 16.58% Impervious, Inflow Depth > 3.45" for 25-Year event
 Inflow = 8.64 cfs @ 12.35 hrs, Volume= 0.944 af
 Outflow = 8.62 cfs @ 12.36 hrs, Volume= 0.944 af, Atten= 0%, Lag= 1.0 min
 Primary = 8.62 cfs @ 12.36 hrs, Volume= 0.944 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= 278.76' @ 12.36 hrs Surf.Area= 470 sf Storage= 228 cf

Plug-Flow detention time= 0.3 min calculated for 0.941 af (100% of inflow)

Center-of-Mass det. time= 0.2 min (795.3 - 795.1)

Volume	Invert	Avail.Storage	Storage Description
#1	277.10'	23,234 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
277.10	10	0	0
278.00	55	29	29
280.00	1,150	1,205	1,234
281.00	2,135	1,643	2,877
282.00	38,580	20,358	23,234

Device	Routing	Invert	Outlet Devices
#1	Primary	277.10'	24.0" Round Culvert L= 50.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 277.10' / 276.85' S= 0.0050 ' S Cc= 0.900 n= 0.013, Flow Area= 3.14 sf
#2	Secondary	281.34'	10.0' long x 29.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.58 cfs @ 12.36 hrs HW=278.75' (Free Discharge)↑**1=Culvert** (Barrel Controls 8.58 cfs @ 4.19 fps)**Secondary OutFlow** Max=0.00 cfs @ 5.00 hrs HW=277.10' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB1: Filter Basin 1

Inflow Area = 4.372 ac, 13.62% Impervious, Inflow Depth > 3.13" for 25-Year event
 Inflow = 10.02 cfs @ 12.32 hrs, Volume= 1.142 af
 Outflow = 7.64 cfs @ 12.51 hrs, Volume= 1.024 af, Atten= 24%, Lag= 11.8 min
 Primary = 7.64 cfs @ 12.51 hrs, Volume= 1.024 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= 270.46' @ 12.51 hrs Surf.Area= 5,231 sf Storage= 9,600 cf

Plug-Flow detention time= 51.6 min calculated for 1.021 af (89% of inflow)
 Center-of-Mass det. time= 19.5 min (816.3 - 796.7)

Volume	Invert	Avail.Storage	Storage Description
#1	268.00'	18,835 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
268.00	2,525	0	0
270.00	4,775	7,300	7,300
272.00	6,760	11,535	18,835

Device	Routing	Invert	Outlet Devices
#1	Primary	265.70'	12.0" Round Culvert L= 38.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 265.70' / 265.50' S= 0.0053 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	268.00'	2.410 in/hr Exfiltration over Surface area
#3	Device 1	269.50'	2.0" x 2.0" Horiz. Orifice/Grate X 64.00 C= 0.600 in 23.7" x 23.7" Grate (46% open area) Limited to weir flow at low heads
#4	Secondary	270.55'	15.0' long x 12.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=7.64 cfs @ 12.51 hrs HW=270.46' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 7.64 cfs @ 9.73 fps)
 ↑ **2=Exfiltration** (Passes < 0.29 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes < 8.37 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=268.00' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB2: Filter Basin 2

Inflow Area = 5.438 ac, 9.05% Impervious, Inflow Depth > 3.12" for 25-Year event
 Inflow = 13.02 cfs @ 12.33 hrs, Volume= 1.413 af
 Outflow = 7.90 cfs @ 12.61 hrs, Volume= 1.314 af, Atten= 39%, Lag= 17.2 min
 Primary = 7.90 cfs @ 12.61 hrs, Volume= 1.314 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

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Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.81' @ 12.61 hrs Surf.Area= 5,480 sf Storage= 12,435 cf

Plug-Flow detention time= 42.0 min calculated for 1.309 af (93% of inflow)
 Center-of-Mass det. time= 18.6 min (817.7 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	272.50'	19,740 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
272.50	1,980	0	0
274.00	3,620	4,200	4,200
276.00	5,675	9,295	13,495
277.00	6,815	6,245	19,740

Device	Routing	Invert	Outlet Devices
#1	Primary	270.25'	12.0" Round Culvert L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.25' / 268.50' S= 0.0219 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	272.50'	2.410 in/hr Exfiltration over Surface area
#3	Device 1	274.00'	2.0" x 2.0" Horiz. Orifice/Grate X 64.00 C= 0.600 in 23.7" x 23.7" Grate (46% open area) Limited to weir flow at low heads
#4	Secondary	275.90'	15.0' long x 12.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=7.90 cfs @ 12.61 hrs HW=275.81' (Free Discharge)

↑ **1=Culvert** (Barrel Controls 7.90 cfs @ 10.06 fps)
 ↑ **2=Exfiltration** (Passes < 0.31 cfs potential flow)
 ↑ **3=Orifice/Grate** (Passes < 11.51 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=272.50' (Free Discharge)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond FB3: Filter Basin 3

Inflow Area = 3.465 ac, 15.71% Impervious, Inflow Depth > 3.43" for 25-Year event
 Inflow = 8.88 cfs @ 12.36 hrs, Volume= 0.991 af
 Outflow = 5.78 cfs @ 12.63 hrs, Volume= 0.908 af, Atten= 35%, Lag= 16.2 min
 Primary = 5.78 cfs @ 12.63 hrs, Volume= 0.908 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= 275.96' @ 12.63 hrs Surf.Area= 3,758 sf Storage= 8,345 cf

Plug-Flow detention time= 45.8 min calculated for 0.905 af (91% of inflow)
 Center-of-Mass det. time= 18.8 min (813.8 - 795.0)

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Volume	Invert	Avail.Storage	Storage Description
#1	273.00'	12,785 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
273.00	1,950	0	0
274.00	2,495	2,223	2,223
276.00	3,785	6,280	8,503
277.00	4,780	4,283	12,785

Device	Routing	Invert	Outlet Devices
#1	Primary	270.70'	10.0" Round Culvert L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 270.70' / 268.00' S= 0.0675 ' S= 0.0675 ' Cc= 0.900 n= 0.013, Flow Area= 0.55 sf
#2	Device 1	273.00'	2.410 in/hr Exfiltration over Surface area
#3	Device 1	274.50'	2.0" x 2.0" Horiz. Orifice/Grate X 64.00 C= 0.600 in 23.7" x 23.7" Grate (46% open area) Limited to weir flow at low heads
#4	Secondary	276.00'	15.0' long x 12.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=5.78 cfs @ 12.63 hrs HW=275.95' (Free Discharge)

- ↑ **1=Culvert** (Inlet Controls 5.78 cfs @ 10.59 fps)
- ↑ **2=Exfiltration** (Passes < 0.21 cfs potential flow)
- ↑ **3=Orifice/Grate** (Passes < 10.32 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=273.00' (Free Discharge)

- ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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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 10:	Runoff Area=162,780 sf 9.05% Impervious Runoff Depth>0.98" Flow Length=503' Tc=23.6 min CN=76 Runoff=2.84 cfs 0.306 af
Subcatchment 11:	Runoff Area=27,670 sf 40.51% Impervious Runoff Depth>1.71" Tc=6.0 min CN=87 Runoff=1.33 cfs 0.090 af
Subcatchment 12:	Runoff Area=9,005 sf 15.77% Impervious Runoff Depth>1.42" Tc=6.0 min CN=83 Runoff=0.36 cfs 0.024 af
Subcatchment 13:	Runoff Area=10,555 sf 25.49% Impervious Runoff Depth>1.56" Tc=6.0 min CN=85 Runoff=0.47 cfs 0.031 af
Subcatchment 14:	Runoff Area=153,990 sf 3.91% Impervious Runoff Depth>0.93" Flow Length=489' Tc=18.2 min CN=75 Runoff=2.81 cfs 0.275 af
Subcatchment 20:	Runoff Area=217,295 sf 7.60% Impervious Runoff Depth>1.04" Flow Length=797' Tc=23.0 min CN=77 Runoff=4.08 cfs 0.432 af
Subcatchment 21:	Runoff Area=19,585 sf 25.10% Impervious Runoff Depth>1.42" Tc=6.0 min CN=83 Runoff=0.79 cfs 0.053 af
Subcatchment 22:	Runoff Area=11,300 sf 24.12% Impervious Runoff Depth>1.49" Tc=6.0 min CN=84 Runoff=0.48 cfs 0.032 af
Subcatchment 23:	Runoff Area=8,780 sf 25.00% Impervious Runoff Depth>1.56" Tc=6.0 min CN=85 Runoff=0.39 cfs 0.026 af
Subcatchment 24:	Runoff Area=154,160 sf 0.00% Impervious Runoff Depth>0.93" Flow Length=712' Tc=23.7 min CN=75 Runoff=2.53 cfs 0.274 af
Subcatchment 30:	Runoff Area=142,965 sf 16.58% Impervious Runoff Depth>1.28" Flow Length=624' Tc=25.4 min CN=81 Runoff=3.22 cfs 0.349 af
Subcatchment 31:	Runoff Area=7,965 sf 0.00% Impervious Runoff Depth>1.05" Tc=6.0 min CN=77 Runoff=0.23 cfs 0.016 af
Subcatchment 32:	Runoff Area=71,360 sf 9.08% Impervious Runoff Depth>0.88" Flow Length=290' Tc=25.4 min CN=74 Runoff=1.06 cfs 0.120 af
Subcatchment 33:	Runoff Area=4,710 sf 30.15% Impervious Runoff Depth>1.29" Tc=6.0 min CN=81 Runoff=0.17 cfs 0.012 af
Subcatchment 34:	Runoff Area=31,500 sf 8.21% Impervious Runoff Depth>0.88" Flow Length=220' Tc=11.3 min CN=74 Runoff=0.64 cfs 0.053 af
Subcatchment 35:	Runoff Area=30,975 sf 18.56% Impervious Runoff Depth>1.35" Flow Length=228' Tc=8.1 min CN=82 Runoff=1.11 cfs 0.080 af

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Subcatchment 36:Runoff Area=502,445 sf 1.53% Impervious Runoff Depth>0.88"
Flow Length=1,468' Tc=21.9 min CN=74 Runoff=7.95 cfs 0.845 af**Subcatchment OS1: Offsite Watershed**Runoff Area=570,265 sf 3.25% Impervious Runoff Depth>0.88"
Flow Length=1,243' Tc=28.3 min CN=74 Runoff=8.10 cfs 0.956 af**Reach R1:**Avg. Flow Depth=0.28' Max Vel=4.95 fps Inflow=8.10 cfs 0.956 af
n=0.035 L=835.0' S=0.0910 '/ Capacity=781.82 cfs Outflow=8.05 cfs 0.951 af**Reach R10:**Avg. Flow Depth=0.18' Max Vel=3.32 fps Inflow=2.17 cfs 0.299 af
n=0.035 L=110.0' S=0.0727 '/ Capacity=226.25 cfs Outflow=2.15 cfs 0.298 af**Reach R11:**Avg. Flow Depth=0.01' Max Vel=0.54 fps Inflow=0.24 cfs 0.024 af
n=0.035 L=145.0' S=0.1000 '/ Capacity=219.36 cfs Outflow=0.20 cfs 0.024 af**Reach R12:**Avg. Flow Depth=0.18' Max Vel=3.49 fps Inflow=2.26 cfs 0.323 af
n=0.035 L=290.0' S=0.0810 '/ Capacity=238.83 cfs Outflow=2.22 cfs 0.321 af**Reach R13:**Avg. Flow Depth=0.02' Max Vel=1.01 fps Inflow=0.32 cfs 0.031 af
n=0.035 L=492.0' S=0.0854 '/ Capacity=145.55 cfs Outflow=0.23 cfs 0.031 af**Reach R20: SHEET FLOW THROUGH**Avg. Flow Depth=0.17' Max Vel=0.39 fps Inflow=3.81 cfs 0.392 af
n=0.400 L=150.0' S=0.1267 '/ Capacity=21.60 cfs Outflow=3.41 cfs 0.385 af**Reach R21:**Avg. Flow Depth=0.04' Max Vel=1.72 fps Inflow=3.41 cfs 0.385 af
n=0.035 L=136.0' S=0.1250 '/ Capacity=245.26 cfs Outflow=3.37 cfs 0.384 af**Reach R22:**Avg. Flow Depth=0.01' Max Vel=0.52 fps Inflow=0.38 cfs 0.032 af
n=0.035 L=145.0' S=0.0552 '/ Capacity=162.94 cfs Outflow=0.29 cfs 0.032 af**Reach R23: (new Reach)**Avg. Flow Depth=0.02' Max Vel=0.71 fps Inflow=0.34 cfs 0.026 af
n=0.035 L=196.0' S=0.0408 '/ Capacity=171.03 cfs Outflow=0.25 cfs 0.026 af**Reach R24:**Avg. Flow Depth=0.06' Max Vel=0.87 fps Inflow=0.53 cfs 0.058 af
n=0.035 L=150.0' S=0.0200 '/ Capacity=77.31 cfs Outflow=0.51 cfs 0.058 af**Reach R25:**Avg. Flow Depth=0.01' Max Vel=0.77 fps Inflow=0.51 cfs 0.058 af
n=0.035 L=278.0' S=0.1223 '/ Capacity=242.59 cfs Outflow=0.44 cfs 0.057 af**Reach R3:**Avg. Flow Depth=0.44' Max Vel=2.29 fps Inflow=16.94 cfs 2.332 af
n=0.025 L=321.0' S=0.0050 '/ Capacity=522.37 cfs Outflow=16.80 cfs 2.321 af**Reach R30:**Avg. Flow Depth=0.13' Max Vel=3.36 fps Inflow=2.90 cfs 0.289 af
n=0.035 L=373.0' S=0.1059 '/ Capacity=447.68 cfs Outflow=2.87 cfs 0.287 af**Reach R31:**Avg. Flow Depth=0.05' Max Vel=1.89 fps Inflow=1.06 cfs 0.120 af
n=0.035 L=246.0' S=0.1057 '/ Capacity=210.21 cfs Outflow=1.05 cfs 0.119 af**Reach R32:**Avg. Flow Depth=0.02' Max Vel=1.34 fps Inflow=0.64 cfs 0.053 af
n=0.035 L=180.0' S=0.1528 '/ Capacity=115.59 cfs Outflow=0.62 cfs 0.053 af**Reach R33:**Avg. Flow Depth=0.08' Max Vel=2.41 fps Inflow=1.11 cfs 0.080 af
n=0.035 L=297.0' S=0.0910 '/ Capacity=781.79 cfs Outflow=1.05 cfs 0.080 af

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Reach R34: Avg. Flow Depth=0.32' Max Vel=2.37 fps Inflow=8.47 cfs 1.030 af
n=0.025 L=180.0' S=0.0083 '/' Capacity=229.09 cfs Outflow=8.42 cfs 1.028 af

Reach R35: Avg. Flow Depth=0.45' Max Vel=2.18 fps Inflow=11.55 cfs 1.368 af
n=0.025 L=278.0' S=0.0047 '/' Capacity=171.61 cfs Outflow=11.39 cfs 1.361 af

Reach R36: Avg. Flow Depth=0.42' Max Vel=2.33 fps Inflow=11.41 cfs 1.373 af
n=0.025 L=210.0' S=0.0057 '/' Capacity=189.71 cfs Outflow=11.28 cfs 1.368 af

Reach R37: Avg. Flow Depth=0.00' Max Vel=0.47 fps Inflow=0.04 cfs 0.012 af
n=0.035 L=308.0' S=0.1438 '/' Capacity=263.08 cfs Outflow=0.03 cfs 0.011 af

Reach R4: Avg. Flow Depth=0.52' Max Vel=2.51 fps Inflow=21.96 cfs 3.035 af
n=0.025 L=338.0' S=0.0050 '/' Capacity=523.19 cfs Outflow=21.75 cfs 3.020 af

Reach R5: Avg. Flow Depth=0.21' Max Vel=4.26 fps Inflow=5.18 cfs 0.715 af
n=0.025 L=79.0' S=0.0500 '/' Capacity=92.45 cfs Outflow=5.17 cfs 0.715 af

Reach R6: Avg. Flow Depth=0.11' Max Vel=3.01 fps Inflow=3.70 cfs 0.627 af
n=0.025 L=90.0' S=0.0500 '/' Capacity=171.12 cfs Outflow=3.68 cfs 0.626 af

Reach SP-1: Inflow=25.08 cfs 3.646 af
Outflow=25.08 cfs 3.646 af

Pond BR1: Peak Elev=271.06' Storage=267 cf Inflow=0.36 cfs 0.024 af
Primary=0.04 cfs 0.019 af Secondary=0.20 cfs 0.005 af Outflow=0.24 cfs 0.024 af

Pond BR2: Peak Elev=277.08' Storage=332 cf Inflow=0.47 cfs 0.031 af
Primary=0.04 cfs 0.024 af Secondary=0.28 cfs 0.008 af Outflow=0.32 cfs 0.031 af

Pond BR3: Peak Elev=277.59' Storage=321 cf Inflow=0.48 cfs 0.032 af
Primary=0.04 cfs 0.023 af Secondary=0.34 cfs 0.009 af Outflow=0.38 cfs 0.032 af

Pond BR4: Peak Elev=277.59' Storage=250 cf Inflow=0.39 cfs 0.026 af
Primary=0.03 cfs 0.019 af Secondary=0.31 cfs 0.008 af Outflow=0.34 cfs 0.026 af

Pond BR5: Peak Elev=272.31' Storage=177 cf Inflow=0.17 cfs 0.012 af
Primary=0.03 cfs 0.011 af Secondary=0.02 cfs 0.000 af Outflow=0.04 cfs 0.012 af

Pond CLVT1: Culvert 1 Peak Elev=271.27' Storage=39 cf Inflow=2.84 cfs 0.306 af
Primary=2.84 cfs 0.306 af Secondary=0.00 cfs 0.000 af Outflow=2.84 cfs 0.306 af

Pond CLVT2: Culvert 2 Peak Elev=279.31' Storage=65 cf Inflow=4.08 cfs 0.432 af
Primary=4.08 cfs 0.432 af Secondary=0.00 cfs 0.000 af Outflow=4.08 cfs 0.432 af

Pond CLVT3: Culvert 3 Peak Elev=278.02' Storage=31 cf Inflow=3.22 cfs 0.349 af
Primary=3.22 cfs 0.349 af Secondary=0.00 cfs 0.000 af Outflow=3.22 cfs 0.349 af

Pond FB1: Filter Basin 1 Peak Elev=269.68' Storage=5,815 cf Inflow=3.37 cfs 0.397 af
Primary=2.17 cfs 0.299 af Secondary=0.00 cfs 0.000 af Outflow=2.17 cfs 0.299 af

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Pond FB2: Filter Basin 2

Peak Elev=274.27' Storage=5,208 cf Inflow=4.41 cfs 0.485 af
Primary=3.81 cfs 0.392 af Secondary=0.00 cfs 0.000 af Outflow=3.81 cfs 0.392 af

Pond FB3: Filter Basin 3

Peak Elev=274.72' Storage=4,197 cf Inflow=3.32 cfs 0.365 af
Primary=2.90 cfs 0.289 af Secondary=0.00 cfs 0.000 af Outflow=2.90 cfs 0.289 af

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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 10:	Runoff Area=162,780 sf 9.05% Impervious Runoff Depth>2.04" Flow Length=503' Tc=23.6 min CN=76 Runoff=6.03 cfs 0.634 af
Subcatchment 11:	Runoff Area=27,670 sf 40.51% Impervious Runoff Depth>3.00" Tc=6.0 min CN=87 Runoff=2.29 cfs 0.159 af
Subcatchment 12:	Runoff Area=9,005 sf 15.77% Impervious Runoff Depth>2.64" Tc=6.0 min CN=83 Runoff=0.67 cfs 0.045 af
Subcatchment 13:	Runoff Area=10,555 sf 25.49% Impervious Runoff Depth>2.82" Tc=6.0 min CN=85 Runoff=0.83 cfs 0.057 af
Subcatchment 14:	Runoff Area=153,990 sf 3.91% Impervious Runoff Depth>1.96" Flow Length=489' Tc=18.2 min CN=75 Runoff=6.11 cfs 0.578 af
Subcatchment 20:	Runoff Area=217,295 sf 7.60% Impervious Runoff Depth>2.12" Flow Length=797' Tc=23.0 min CN=77 Runoff=8.47 cfs 0.879 af
Subcatchment 21:	Runoff Area=19,585 sf 25.10% Impervious Runoff Depth>2.64" Tc=6.0 min CN=83 Runoff=1.45 cfs 0.099 af
Subcatchment 22:	Runoff Area=11,300 sf 24.12% Impervious Runoff Depth>2.73" Tc=6.0 min CN=84 Runoff=0.86 cfs 0.059 af
Subcatchment 23:	Runoff Area=8,780 sf 25.00% Impervious Runoff Depth>2.82" Tc=6.0 min CN=85 Runoff=0.69 cfs 0.047 af
Subcatchment 24:	Runoff Area=154,160 sf 0.00% Impervious Runoff Depth>1.96" Flow Length=712' Tc=23.7 min CN=75 Runoff=5.48 cfs 0.577 af
Subcatchment 30:	Runoff Area=142,965 sf 16.58% Impervious Runoff Depth>2.44" Flow Length=624' Tc=25.4 min CN=81 Runoff=6.17 cfs 0.669 af
Subcatchment 31:	Runoff Area=7,965 sf 0.00% Impervious Runoff Depth>2.13" Tc=6.0 min CN=77 Runoff=0.48 cfs 0.032 af
Subcatchment 32:	Runoff Area=71,360 sf 9.08% Impervious Runoff Depth>1.88" Flow Length=290' Tc=25.4 min CN=74 Runoff=2.37 cfs 0.257 af
Subcatchment 33:	Runoff Area=4,710 sf 30.15% Impervious Runoff Depth>2.46" Tc=6.0 min CN=81 Runoff=0.33 cfs 0.022 af
Subcatchment 34:	Runoff Area=31,500 sf 8.21% Impervious Runoff Depth>1.89" Flow Length=220' Tc=11.3 min CN=74 Runoff=1.43 cfs 0.114 af
Subcatchment 35:	Runoff Area=30,975 sf 18.56% Impervious Runoff Depth>2.55" Flow Length=228' Tc=8.1 min CN=82 Runoff=2.08 cfs 0.151 af

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Subcatchment 36:Runoff Area=502,445 sf 1.53% Impervious Runoff Depth>1.88"
Flow Length=1,468' Tc=21.9 min CN=74 Runoff=17.73 cfs 1.810 af**Subcatchment OS1: Offsite Watershed**Runoff Area=570,265 sf 3.25% Impervious Runoff Depth>1.88"
Flow Length=1,243' Tc=28.3 min CN=74 Runoff=18.01 cfs 2.049 af**Reach R1:**Avg. Flow Depth=0.44' Max Vel=6.45 fps Inflow=18.01 cfs 2.049 af
n=0.035 L=835.0' S=0.0910 '/ Capacity=781.82 cfs Outflow=17.88 cfs 2.041 af**Reach R10:**Avg. Flow Depth=0.33' Max Vel=4.65 fps Inflow=6.14 cfs 0.677 af
n=0.035 L=110.0' S=0.0727 '/ Capacity=226.25 cfs Outflow=6.13 cfs 0.677 af**Reach R11:**Avg. Flow Depth=0.01' Max Vel=0.81 fps Inflow=0.63 cfs 0.045 af
n=0.035 L=145.0' S=0.1000 '/ Capacity=219.36 cfs Outflow=0.59 cfs 0.044 af**Reach R12:**Avg. Flow Depth=0.33' Max Vel=4.90 fps Inflow=6.41 cfs 0.721 af
n=0.035 L=290.0' S=0.0810 '/ Capacity=238.83 cfs Outflow=6.39 cfs 0.720 af**Reach R13:**Avg. Flow Depth=0.04' Max Vel=1.51 fps Inflow=0.78 cfs 0.056 af
n=0.035 L=492.0' S=0.0854 '/ Capacity=145.55 cfs Outflow=0.66 cfs 0.055 af**Reach R20: SHEET FLOW THROUGH**Avg. Flow Depth=0.26' Max Vel=0.52 fps Inflow=7.25 cfs 0.880 af
n=0.400 L=150.0' S=0.1267 '/ Capacity=21.60 cfs Outflow=7.23 cfs 0.871 af**Reach R21:**Avg. Flow Depth=0.06' Max Vel=2.32 fps Inflow=7.23 cfs 0.871 af
n=0.035 L=136.0' S=0.1250 '/ Capacity=245.26 cfs Outflow=7.23 cfs 0.870 af**Reach R22:**Avg. Flow Depth=0.02' Max Vel=0.75 fps Inflow=0.82 cfs 0.057 af
n=0.035 L=145.0' S=0.0552 '/ Capacity=162.94 cfs Outflow=0.77 cfs 0.057 af**Reach R23: (new Reach)**Avg. Flow Depth=0.04' Max Vel=1.00 fps Inflow=0.67 cfs 0.046 af
n=0.035 L=196.0' S=0.0408 '/ Capacity=171.03 cfs Outflow=0.62 cfs 0.046 af**Reach R24:**Avg. Flow Depth=0.10' Max Vel=1.25 fps Inflow=1.38 cfs 0.102 af
n=0.035 L=150.0' S=0.0200 '/ Capacity=77.31 cfs Outflow=1.33 cfs 0.102 af**Reach R25:**Avg. Flow Depth=0.02' Max Vel=1.14 fps Inflow=1.33 cfs 0.102 af
n=0.035 L=278.0' S=0.1223 '/ Capacity=242.59 cfs Outflow=1.20 cfs 0.101 af**Reach R3:**Avg. Flow Depth=0.74' Max Vel=3.10 fps Inflow=40.11 cfs 4.991 af
n=0.025 L=321.0' S=0.0050 '/ Capacity=522.37 cfs Outflow=39.96 cfs 4.975 af**Reach R30:**Avg. Flow Depth=0.19' Max Vel=4.18 fps Inflow=5.24 cfs 0.619 af
n=0.035 L=373.0' S=0.1059 '/ Capacity=447.68 cfs Outflow=5.24 cfs 0.617 af**Reach R31:**Avg. Flow Depth=0.09' Max Vel=2.54 fps Inflow=2.37 cfs 0.257 af
n=0.035 L=246.0' S=0.1057 '/ Capacity=210.21 cfs Outflow=2.35 cfs 0.256 af**Reach R32:**Avg. Flow Depth=0.04' Max Vel=1.84 fps Inflow=1.43 cfs 0.114 af
n=0.035 L=180.0' S=0.1528 '/ Capacity=115.59 cfs Outflow=1.39 cfs 0.114 af**Reach R33:**Avg. Flow Depth=0.12' Max Vel=3.04 fps Inflow=2.08 cfs 0.151 af
n=0.035 L=297.0' S=0.0910 '/ Capacity=781.79 cfs Outflow=1.98 cfs 0.151 af

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Reach R34: Avg. Flow Depth=0.51' Max Vel=3.12 fps Inflow=18.67 cfs 2.191 af
n=0.025 L=180.0' S=0.0083 '/' Capacity=229.09 cfs Outflow=18.57 cfs 2.187 af

Reach R35: Avg. Flow Depth=0.70' Max Vel=2.81 fps Inflow=24.50 cfs 2.918 af
n=0.025 L=278.0' S=0.0047 '/' Capacity=171.61 cfs Outflow=24.37 cfs 2.909 af

Reach R36: Avg. Flow Depth=0.66' Max Vel=3.01 fps Inflow=24.52 cfs 2.931 af
n=0.025 L=210.0' S=0.0057 '/' Capacity=189.71 cfs Outflow=24.43 cfs 2.925 af

Reach R37: Avg. Flow Depth=0.01' Max Vel=0.57 fps Inflow=0.29 cfs 0.022 af
n=0.035 L=308.0' S=0.1438 '/' Capacity=263.08 cfs Outflow=0.17 cfs 0.022 af

Reach R4: Avg. Flow Depth=0.86' Max Vel=3.39 fps Inflow=52.41 cfs 6.522 af
n=0.025 L=338.0' S=0.0050 '/' Capacity=523.19 cfs Outflow=52.20 cfs 6.502 af

Reach R5: Avg. Flow Depth=0.35' Max Vel=5.71 fps Inflow=12.62 cfs 1.548 af
n=0.025 L=79.0' S=0.0500 '/' Capacity=92.45 cfs Outflow=12.61 cfs 1.547 af

Reach R6: Avg. Flow Depth=0.23' Max Vel=4.63 fps Inflow=12.34 cfs 1.353 af
n=0.025 L=90.0' S=0.0500 '/' Capacity=171.12 cfs Outflow=12.19 cfs 1.352 af

Reach SP-1: Inflow=62.68 cfs 7.853 af
Outflow=62.68 cfs 7.853 af

Pond BR1: Peak Elev=271.13' Storage=315 cf Inflow=0.67 cfs 0.045 af
Primary=0.04 cfs 0.025 af Secondary=0.59 cfs 0.019 af Outflow=0.63 cfs 0.045 af

Pond BR2: Peak Elev=277.15' Storage=387 cf Inflow=0.83 cfs 0.057 af
Primary=0.04 cfs 0.030 af Secondary=0.74 cfs 0.025 af Outflow=0.78 cfs 0.056 af

Pond BR3: Peak Elev=277.66' Storage=367 cf Inflow=0.86 cfs 0.059 af
Primary=0.04 cfs 0.029 af Secondary=0.78 cfs 0.028 af Outflow=0.82 cfs 0.057 af

Pond BR4: Peak Elev=277.64' Storage=279 cf Inflow=0.69 cfs 0.047 af
Primary=0.03 cfs 0.023 af Secondary=0.63 cfs 0.023 af Outflow=0.67 cfs 0.046 af

Pond BR5: Peak Elev=272.38' Storage=207 cf Inflow=0.33 cfs 0.022 af
Primary=0.03 cfs 0.016 af Secondary=0.26 cfs 0.006 af Outflow=0.29 cfs 0.022 af

Pond CLVT1: Culvert 1 Peak Elev=271.74' Storage=85 cf Inflow=6.03 cfs 0.634 af
Primary=6.03 cfs 0.634 af Secondary=0.00 cfs 0.000 af Outflow=6.03 cfs 0.634 af

Pond CLVT2: Culvert 2 Peak Elev=279.89' Storage=147 cf Inflow=8.47 cfs 0.879 af
Primary=8.46 cfs 0.879 af Secondary=0.00 cfs 0.000 af Outflow=8.46 cfs 0.879 af

Pond CLVT3: Culvert 3 Peak Elev=278.45' Storage=108 cf Inflow=6.17 cfs 0.669 af
Primary=6.16 cfs 0.668 af Secondary=0.00 cfs 0.000 af Outflow=6.16 cfs 0.668 af

Pond FB1: Filter Basin 1 Peak Elev=269.97' Storage=7,162 cf Inflow=6.94 cfs 0.793 af
Primary=6.14 cfs 0.677 af Secondary=0.00 cfs 0.000 af Outflow=6.14 cfs 0.677 af

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Pond FB2: Filter Basin 2

Peak Elev=274.80' Storage=7,447 cf Inflow=9.06 cfs 0.978 af
Primary=7.25 cfs 0.880 af Secondary=0.00 cfs 0.000 af Outflow=7.25 cfs 0.880 af

Pond FB3: Filter Basin 3

Peak Elev=275.10' Storage=5,347 cf Inflow=6.35 cfs 0.701 af
Primary=5.24 cfs 0.619 af Secondary=0.00 cfs 0.000 af Outflow=5.24 cfs 0.619 af