

DRAINAGE REPORT

“Timber Crest Estates” *Medway, MA*

September 7, 2017

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DRAINAGE REPORT
“Timber Crest Estates”
MEDWAY, MASSACHUSETTS

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DRAINAGE REPORT
“TIMBER CREST ESTATES”
MEDWAY, MASSACHUSETTS
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Section 1.0: Introduction

This report was prepared to accompany the Notice of Intent filing for the Timber Crest Estates project, consisting of a proposed subdivision of 147 house lots on 168 acres in the north section of Medway. Conservation Permitting Plans dated August 25, 2017 show the proposed project in detail, based upon a Comprehensive Permit per MGL Ch. 40B, issued by the Medway Zoning Board of Appeals. The drainage calculations herein document that stormwater runoff rates can be controlled using structural and low-impact development techniques, in compliance with the Massachusetts Department of Environmental Protection's (DEP's) Stormwater Management Regulations.

Section 2.0: Existing Conditions

Timber Crest Estates is located in the northerly area of Medway (refer to USGS Locus Map, Figure 1), containing 10 parcels of mostly woodlands, totaling approximately 170 acres. The site is bordered by residential areas along Winthrop Street and Ohlson Circle to the west, Fairway Lane to the north, Holliston Street to the east, and Fern Path and Howe Street to the south. The site is in the AR-I zoning district. Homes in the area are generally ranch or colonial-style homes situated on lots ranging in size from approximately ¼ to 1+ acres.

The property is currently mostly wooded, except for homesites at 102 Winthrop Street and 165 Holliston Street, with two utility easements running parallel to each other across the site. These easements are for underground natural gas mains (Algonquin Gas Transmission Company) and overhead, electric power transmission lines (Boston Edison). The site topography is relatively gently sloping, characterized by small hills and lower valleys where wetlands are located. Elevations are approximately 266 ft. at Winthrop Street, 280 ft. at Fairway Lane, 270 ft. at Holliston Street, and 274 ft. at Fern Path, with interior elevations ranging from approximately 265 ft. to 284 ft.

Soils in the upland areas of the site have been identified by the NRCS as varying types of sandy loam, with both Hydrologic Soil Group A and C. Refer to Appendix A for NRCS soils map information. Test pits were dug in locations where stormwater basins are proposed to document soil types and groundwater conditions (refer to the subdivision plans for test pit locations and soil logs). Soils in these test pits varied across the site, and included areas of sand, loamy sand and sandy loam. Groundwater was identified in some test pits either via mottling or standing water in the holes, and varied from approximately 3 ft. below ground surface or deeper in most locations.

The site location is not within any mapped environmentally sensitive areas based on review of MassGIS data, except there are three certified vernal pools in the northeast portion of the site and five other potential vernal pools that have all been mapped and

previously reviewed by the Medway Conservation Commission. The site is not within any regulatory floodways (i.e., no 100-yr. floodplains, see attached Flood Insurance Rate Map, Figure 2), state-designated Outstanding Resource Waters, Areas of Critical Environmental Concern (see Figure 3), Zone II of public wells or Zone A of public water supplies, or priority habitat of endangered or rare species as mapped by the MA Division of Fisheries and Wildlife (see Figure 4).

The wetlands on the site have been delineated with most of the bordering vegetated wetlands approved via three Orders of Resource Area Delineation issued by the Medway Conservation Commission; a fourth ORAD indicates that there is an intermittent stream present on the east portion of the site flowing northerly from the site to a culvert under Fairway Lane (note: the intermittent determination extends up to the south property line of the 165 Holliston Street property, and this streambed has also been documented to be dry to at least the north property line at 167 Holliston Street (land of Richards)).

The wetlands cover much of the interior portions of the site, and drain off-site to the northwest, northeast and southwest through three (3) different intermittent streams. Other discharge points are located (1) along the west boundary of the site towards the Winthrop Street drainage system, and (2) two isolated wetlands in the southwest corner of the site. These areas were delineated as a result of field investigations and review of the topography.

As such, the site was delineated into a number of sub-catchment areas, and runoff conditions were calculated at these 5 design discharge points, representing the flow to each of the wetland areas. Please refer to Appendix D-1 for Pre-Development Drainage Calcs and Appendix J for the Pre-Development Watershed Plan).

Section 3.0: Proposed Development

Timber Crest Estates is a subdivision with two separate neighborhoods planned to preserve wetlands and upland areas between them as open space. The project consists of 147 homes, including 70 single family homes on the west portion of the site and 77 single-family homes on the east portion of the site. The subdivision roadway entrance for the west side is off of Winthrop Street directly opposite from Stephanie Road, ending in a cul de sac with an emergency access connecting to Ohlson Circle. The east side subdivision includes roadways that will connect Fairway Lane to Holliston Street; 2 lots are also proposed at the end of Fern Path. The subdivision will be serviced by town sewer and water mains. Underground cable utilities and natural gas are also to be provided.

Two permanent wetland crossings will be required to build the roadways on the east side, and a crossing over an intermittent stream is required for the emergency access road behind the home on 13 Ohlson Circle. Two temporary wetland alterations will be required to connect town water and sewer mains between the east and west side subdivisions. Wetland replication areas will be provided at a ratio of 1:1.

The site design and stormwater management system features sustainable development techniques to minimize the impact on the environment. It utilizes several low impact development techniques and best management practices (BMPs) as outlined in DEP's Stormwater Management Handbook, including the following:

- Narrower roadways, small lots and short driveways to reduce impervious area,
- Grassed parking areas at the two proposed bus shelters at Winthrop Street and Holliston Street.
- Roof drains are planned for most homes to recharge groundwater, and bioretention areas (or rain gardens) are planned in several locations to control runoff.
- Thirteen stormwater infiltration basins and three detention basins are proposed to control site runoff; some areas also utilize underground leaching chambers and a water quality swale.
- As was recommended by the Medway Department of Public Services in a comment letter during the Comprehensive Permit hearings with the Zoning Board, the site design and stormwater system for the 2 proposed homes at the end of Fern Path incorporate a T-turnaround for emergency vehicles (instead of a large paved cul de sac) and a shallow grassed infiltration swale, as low impact development features.
- All stormwater runoff from the other east and west side roads are directed to deep sump catch basins and piped to detention and infiltration basins which will store and infiltrate the runoff and slowly release it at a reduced flow rate from existing conditions. Some of the runoff will be discharged into the underlying soil (via roof drains and infiltration basins) thus providing recharge to the local aquifer.

These BMPs are sited at appropriate locations based on the soils and setbacks to wetlands, and were sized to accommodate the 100-year design storm without increasing any potential for downstream flooding. Refer to Appendix D-2 for the post-development hydrology calculations and Appendix J for the watershed map.

Section 4.0: Drainage Design Methodology

To determine changes in storm runoff for the proposed project, the HydroCAD Stormwater Modeling System software was used. This software closely approximates the USDA Soil Conservation Service (SCS) TR-20 methodology for calculating runoff. The calculations determined the change in the existing and post-development runoff rates to each drainage design point for each of the 2 year, 10 year, and 100 year storm events (and as requested by the Conservation Commission during the Comprehensive Permit hearings, the 25-year storm was also analyzed). All storm events analyzed comply with Technical Paper-40 (*Rainfall Frequency Atlas of the United States*) Rainfall Data. Infiltration rates used to size the recharge BMPs are based on the soil types found in the test pits and Rawl's rates as designated by DEP.

The stormwater design complies with the DEP Stormwater Management Regulations, incorporating a number of BMPs for water quality, recharge and runoff control (refer to Appendix B for the DEP Stormwater Checklist). The calculations herein document

compliance with rate and volume control, sizing of the detention and infiltration systems, as well as pretreatment, water quality and recharge volumes, and discharge velocities. Other appendices include operation and maintenance plans to ensure long-term viability of these drainage systems and to prevent pollution and degradation of the environment.

Please note that this project is subject to a NPDES General Construction Permit but a Storm Water Pollution Prevention Plan shall be submitted prior to construction to comply with Standard 8 of the DEP Stormwater Management Regulations provided in the appendices.

Section 5.0: Summary of Results

In accordance with DEP requirements, the storm water design controls runoff for the 2 year, 10 year, and 100 year storm events (and also the 25-year storm) below existing conditions. There are five off-site design points that were analyzed with a summary of runoff rates and volumes as follows.

Comparison of Pre- & Post-Development Runoff Rates **Design Point 1 - To Wetland and Low Area @ Winthrop Street**

	<u>Pre development</u>	<u>Post development</u>
	Rate/Volume	Rate/Volume
<u>2 Year Storm (3.20")</u>		
• To Design Point 1	0.32 cfs 0.077 af	0.03 cfs 0.015 af
<u>10 Year Storm (4.70")</u>		
• To Design Point 1	3.48 cfs 0.480 af	2.69 cfs 0.337 af
<u>25 Year Storm (5.50")</u>		
• To Design Point 1	7.27 cfs 0.756 af	5.85 cfs 0.584 af
<u>100 Year Storm (6.70")</u>		
• To Design Point 1	12.68 cfs 1.228 af	11.50 cfs 1.017 af

Design Point 2 – To Intermittent Stream Flowing Offsite Northwest

	<u>Pre development</u>	<u>Post development</u>
	Rate	Rate
<u>2 Year Storm (3.20")</u>		
• To Design Point 2	0.70 cfs 0.140 af	0.48 cfs 0.104 af
<u>10 Year Storm (4.70")</u>		
• To Design Point 2	3.84 cfs 0.447 af	2.85 cfs 0.348 af
<u>25 Year Storm (5.50")</u>		
• To Design Point 2	6.26 cfs 0.794 af	4.81 cfs 0.545 af
<u>100 Year Storm (6.70")</u>		
• To Design Point 2	10.41 cfs 1.621 af	8.34 cfs 1.332 af

Design Point 3 - To Central Wetlands Flowing to Lovering Street

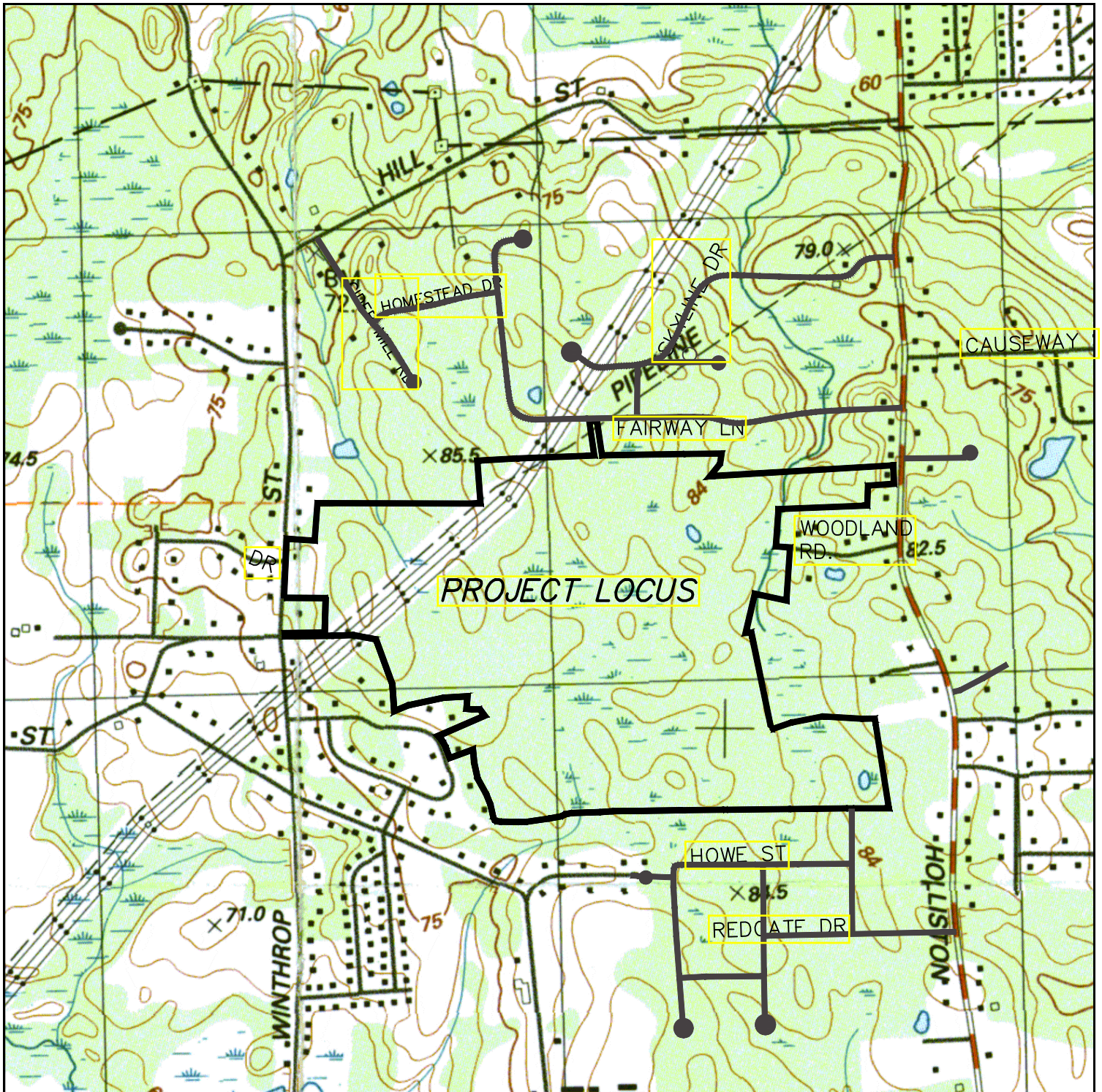
	<u>Pre development</u>	<u>Post development</u>
	Rate	Rate
<u>2 Year Storm (3.20")</u> To Design Point 3	1.65 cfs 0.394 af	1.28 cfs 0.357 af
<u>10 Year Storm (4.70")</u> To Design Point 3	9.47 cfs 1.43 af	8.69 cfs 1.291 af
<u>25 Year Storm (5.50")</u> To Design Point 3	15.77 cfs 2.245 af	15.63 cfs 2.015 af
<u>100 Year Storm (6.70")</u> To Design Point 3	29.08 cfs 3.735 af	29.06 cfs 3.29 af

Design Point 4 - To East Wetlands Flowing to Fairway Lane Culvert

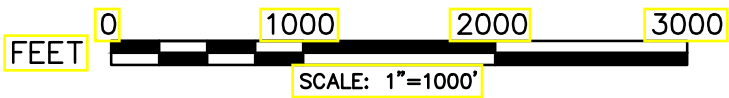
	<u>Pre development</u>	<u>Post development</u>
	Rate	Rate
<u>2 Year Storm (3.20")</u> To Design Point 4	3.15 cfs 0.418 af	2.54 cfs 0.387 af
<u>10 Year Storm (4.70")</u> To Design Point 4	8.67 cfs 1.177 af	7.65 cfs 1.111 af
<u>25 Year Storm (5.50")</u> To Design Point 4	13.75 cfs 1.727 af	12.8 cfs 1.654 af
<u>100 Year Storm (6.70")</u> To Design Point 4	23.17 cfs 2.711 af	22.12 cfs 2.59 af

Design Point 5 - To Onsite Isolated Wetlands North of Ohlson Circle

	<u>Pre development</u>	<u>Post development</u>
	Rate	Rate
<u>2 Year Storm (3.20")</u> To Design Point 5	0.00 cfs 0.00 af	0.00 cfs 0.00 af
<u>10 Year Storm (4.70")</u> To Design Point 5	0.00 cfs 0.00 af	0.00 cfs 0.001 af
<u>25 Year Storm (5.50")</u> To Design Point 5	0.02 cfs 0.016 af	.02 cfs 0.017 af
<u>100 Year Storm (6.70")</u> To Design Point 5	0.14 cfs 0.089 af	0.12 cfs 0.076 af

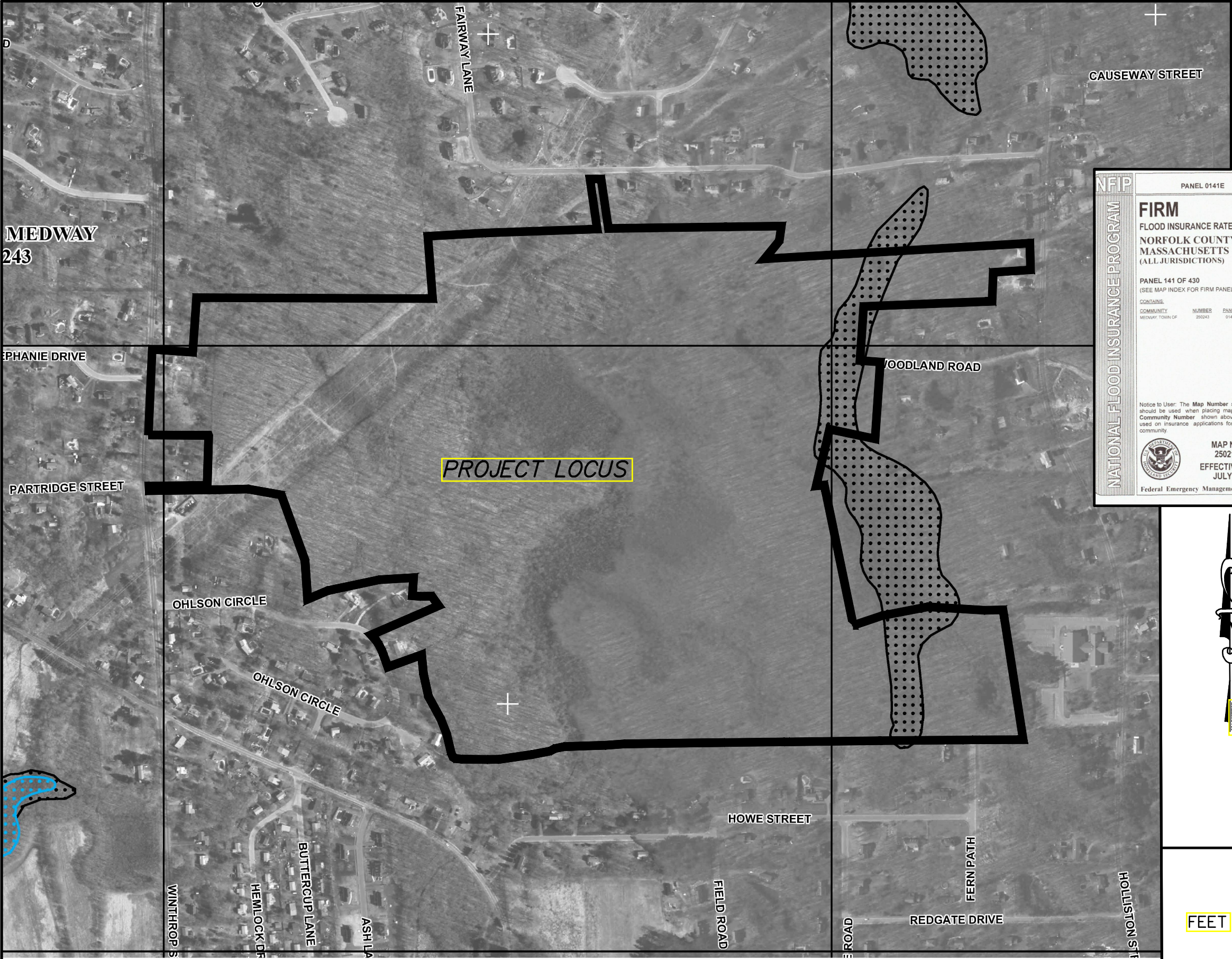


USGS LOCUS MAP
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: USGS MAP



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LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A

No Base Flood Elevations determined.

ZONE AE

Base Flood Elevations determined.

ZONE AH

Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO

Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR

Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99

Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V

Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE

Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X

Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X

Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D

Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

NFIP

PANEL 0141E

FIRM

FLOOD INSURANCE RATE MAP

NORFOLK COUNTY,
MASSACHUSETTS
(ALL JURISDICTIONS)

PANEL 141 OF 430
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MEDWAY TOWN OF	250243	0141	E

Notice to User: The Map Number shown below should be used when placing map orders, the Community Number shown above should be used on insurance applications for the subject community

MAP NUMBER
25021C0141E

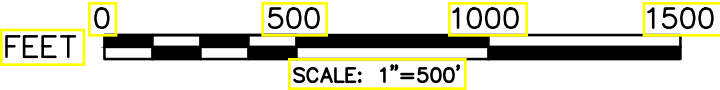
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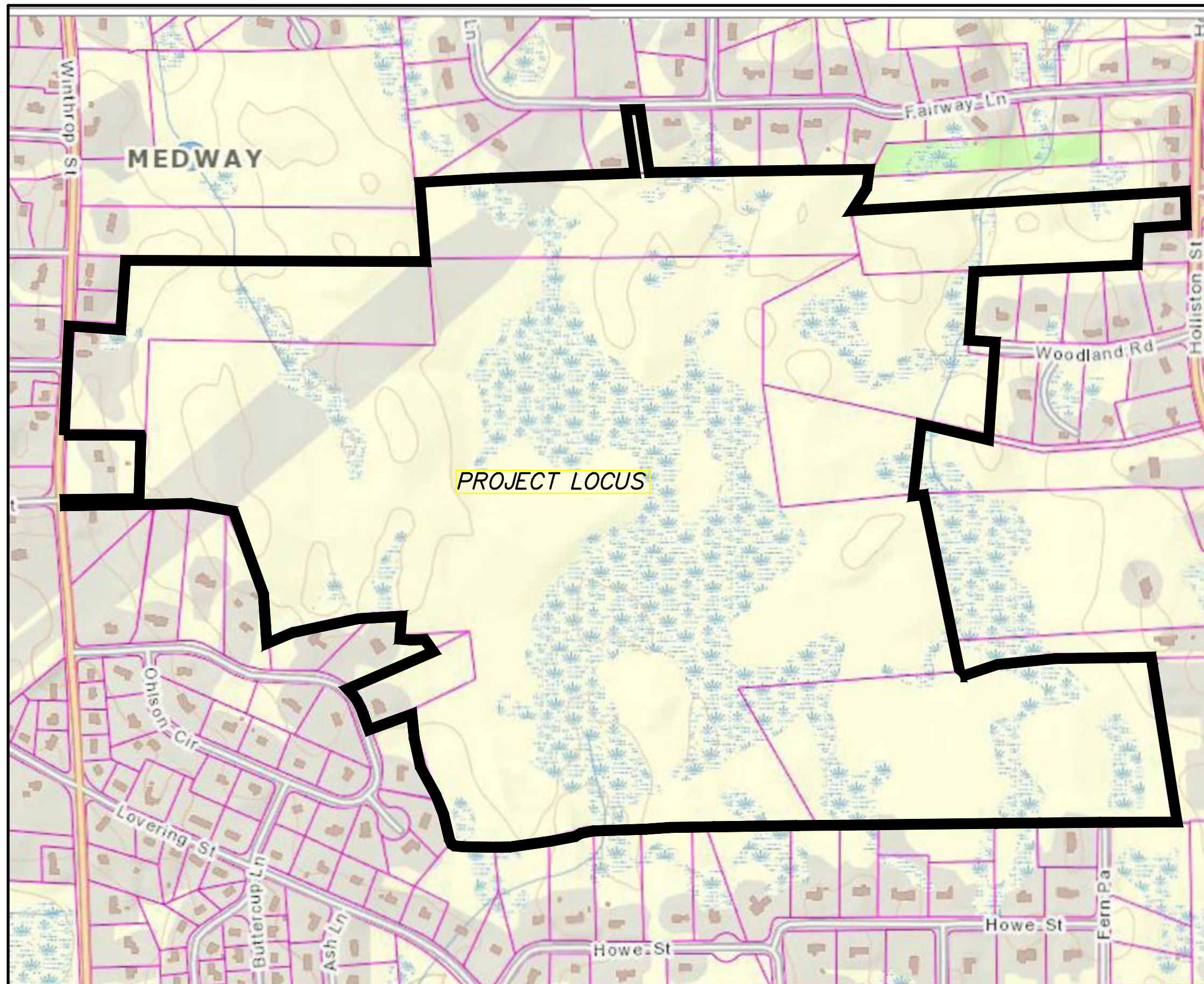
Federal Emergency Management Agency

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FLOOD MAP
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: BING MAPS





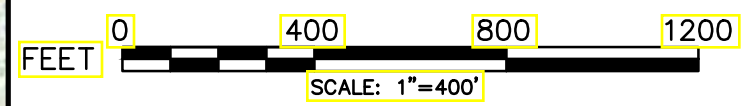
- Areas of Critical Environmental Concern ACECs
- ☐ Tax Parcels for Query
- Detailed Features
- Tax Parcels
- Structures

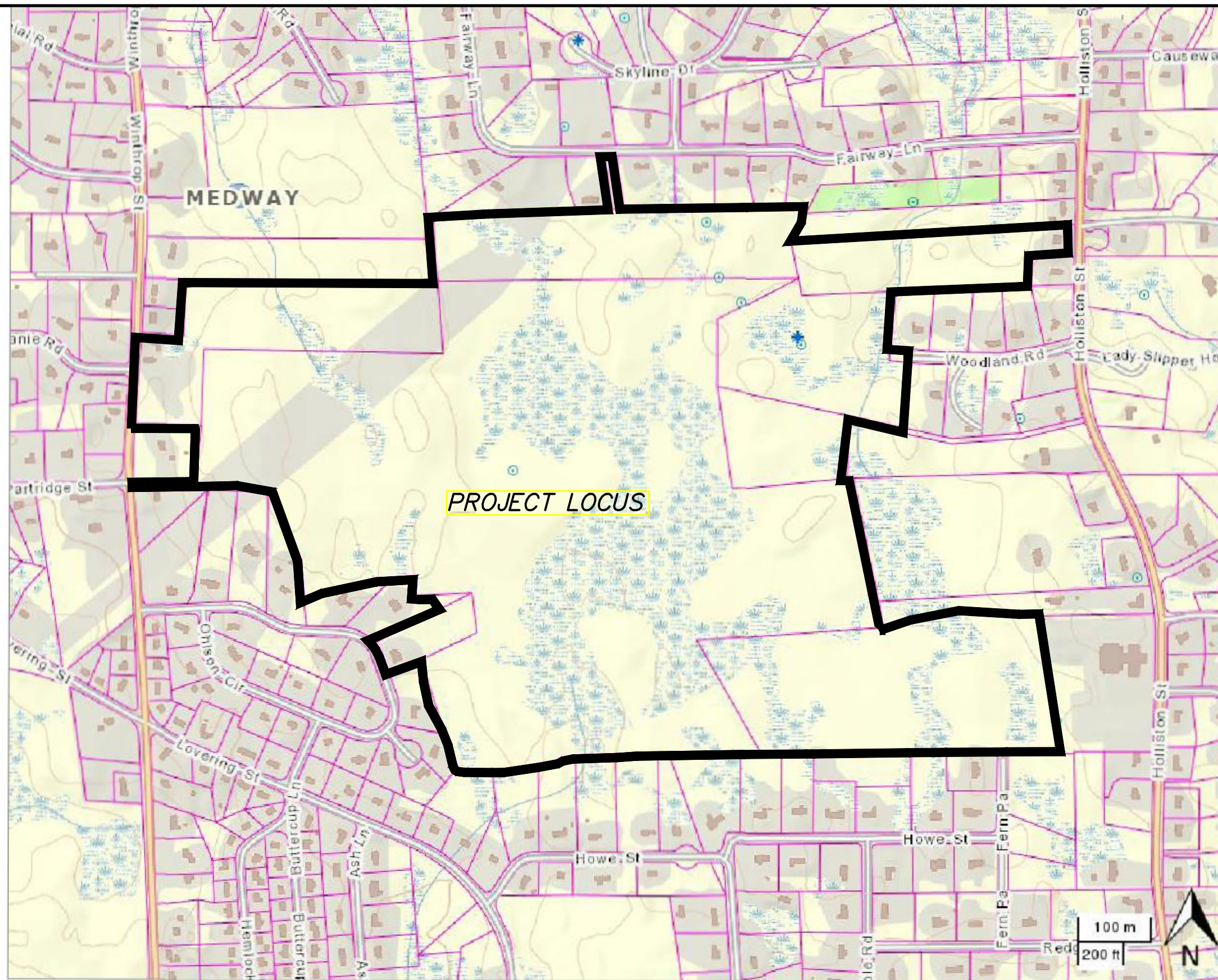


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AREAS OF CRITICAL AND ENVIRONMENTAL CONCERN
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: MASSGIS





NHESP Estimated Habitats of Rare Wildlife

Potential Vernal Pools

NHESP Priority Habitats of Rare Species

NHESP Certified Vernal Pools

Tax Parcels for Query

Detailed Features

Tax Parcels

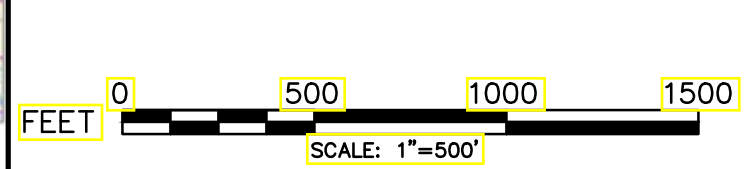
Structures



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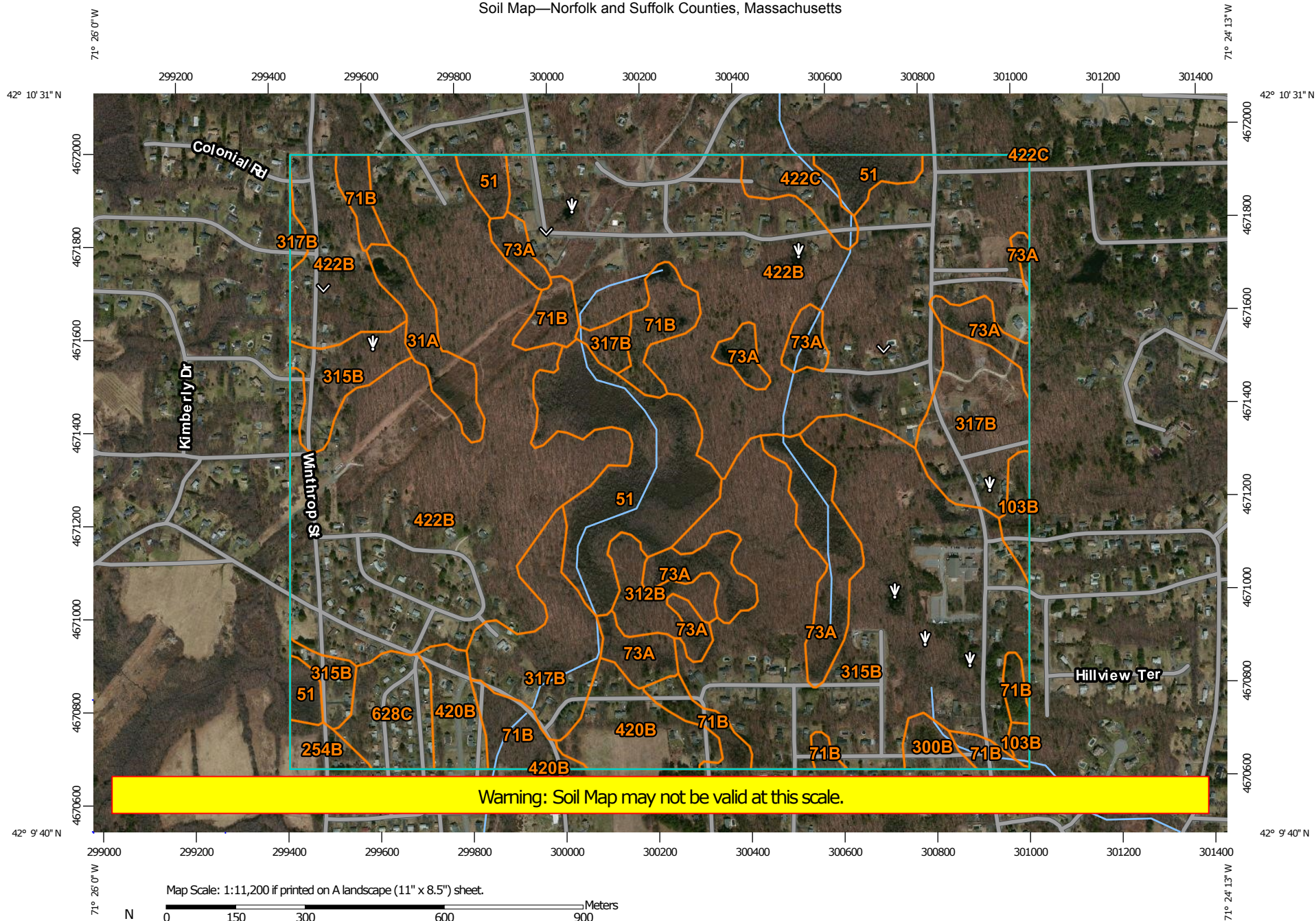
NATURAL HERITAGE MAP
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: 2008 MAPPING BY
NHESP OF THE
MASSACHUSETTS DIVISIONS
OF FISHERIES AND WILDLIFE



Appendix A

NRCS Soil characteristics for on-site soils

Soil Map—Norfolk and Suffolk Counties, Massachusetts



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

9/30/2016
Page 1 of 3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 11, Sep 28, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 8, 2011—Apr 9, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Norfolk and Suffolk Counties, Massachusetts (MA616)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
31A	Walpole sandy loam, 0 to 3 percent slopes	7.9	1.5%
51	Swansea muck, 0 to 1 percent slopes	37.6	7.2%
71B	Ridgebury fine sandy loam, 2 to 8 percent slopes, extremely stony	25.8	4.9%
73A	Whitman fine sandy loam, 0 to 5 percent slopes, extremely stony	33.8	6.5%
103B	Charlton-Hollis-Rock outcrop complex, 3 to 8 percent slopes	3.9	0.7%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	3.2	0.6%
300B	Montauk fine sandy loam, 3 to 8 percent slopes	3.1	0.6%
312B	Woodbridge fine sandy loam, 0 to 8 percent slopes, extremely stony	6.6	1.3%
315B	Scituate fine sandy loam, 3 to 8 percent slopes	101.3	19.4%
317B	Scituate fine sandy loam, 3 to 8 percent slopes, extremely stony	36.8	7.0%
420B	Canton fine sandy loam, 3 to 8 percent slopes	18.5	3.5%
422B	Canton fine sandy loam, 3 to 8 percent slopes, extremely stony	227.9	43.6%
422C	Canton fine sandy loam, 8 to 15 percent slopes, extremely stony	5.9	1.1%
628C	Canton-Urban land complex, 3 to 15 percent slopes	10.2	1.9%
Totals for Area of Interest		522.4	100.0%

Appendix B
DEP Checklist for Stormwater Report



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☒ New development
- ☐ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☒ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☒ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☒ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☐ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☐ Static
 - ☒ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☐ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☒ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☒ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☒ is near or to other critical areas
 - ☒ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☒ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☒ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☐ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
 - ☐ Redevelopment Project
 - ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☐ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☐ Description and delineation of public safety features;
 - ☐ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

Appendix C

Maximum Discharge Velocities (Standard #1)



165 East Grove Street
Middleborough, MA 02346

Tel: 508-946-9231

Fax: 508-947-8873

www.outback-eng.com

JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway

CALC BY: CJV **DATE:** 9/7/17
CHECK BY: J.A.P **DATE:** 9/7/17

STANDARD 1: NO UNTREATED DISCHARGE OR EROSION TO WETLANDS

No new untreated discharge:

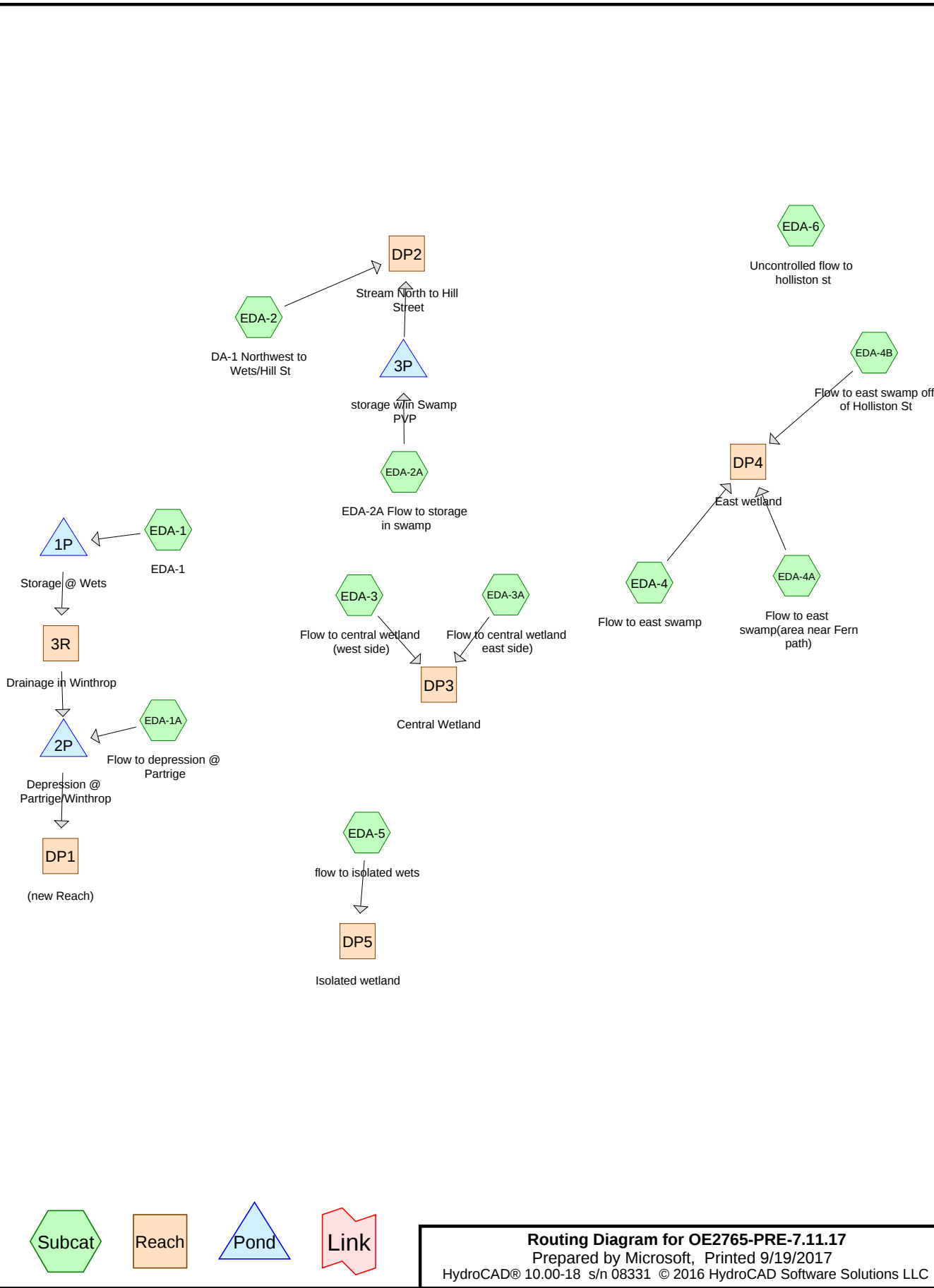
Computations required to demonstrate compliance with Standards 4 through 6 may be used to demonstrate that all new discharges are adequately treated.

Maximum Discharge Velocity & Ability of Ground Surface to Resist Erosion:

<u>Discharge Outlet</u>	<u>Max. Discharge Velocity (ft/s)*</u>	<u>Receiving Groundcover</u>	<u>Receiving Slope</u>	<u>Permissible Velocity (ft/s)**</u>	<u>Suitability</u>
4" Orifice @ Det Basin 1	5.35	Lawn	1%	5	Requires Level Spreader
4" Orifice @ Infil. Basin #2	5.14	Lawn	2%	5	Requires Level Spreader
2" Orifice @ Det. Basin #6	4.13	Lawn	2%	5	O.K.
(2) 4" Orifice @ Infil. Basin #9	3.03	Lawn	5%	5	O.K.
6" Orifice @ Infil. Basin #8	5.07	Lawn	4%	5	Requires Level Spreader
4" Orifice @ Ext. Dry Det. Basin #8A	7.52	Lawn	1%	5	Requires Level Spreader
2" Orifice @ Ext. Dry Det. Basin #10	8.27	Lawn	2%	5	Requires Level Spreader
8" culverts @ LC-4 bed	3.05	Lawn	2%	5	O.K.
2" Orifice @ Ext. Dry Det. Basin #11	9.47	Lawn	2%	5	Requires Level Spreader
2" Orifice @ Infil. Basin #13	4.25	Lawn	2%	5	O.K.
2" Orifice @ Ext. Dry Det. Basin #14	9.47	Lawn	2%	5	Requires Level Spreader
Broad-crested weir @ infil. Basin #16	1.17	Lawn	2%	5	O.K.

* Maximum discharge velocity obtained from post-development hydrology calculation (see Appendix C-2)

Appendix D-1
Existing Hydrology Calculations (Standard #2)



Routing Diagram for OE2765-PRE-7.11.17

Prepared by Microsoft, Printed 9/19/2017

HydroCAD® 10.00-18 s/n 08331 © 2016 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
4.723	51	1 acre lots, 20% imp, HSG A (EDA-1, EDA-1A, EDA-2, EDA-3, EDA-3A)
1.849	79	1 acre lots, 20% imp, HSG C (EDA-1, EDA-1A, EDA-2)
0.206	84	1 acre lots, 20% imp, HSG D (EDA-3A)
0.227	49	50-75% Grass cover, Fair, HSG A (EDA-4B, EDA-6)
0.115	39	>75% Grass cover, Good, HSG A (EDA-5)
0.023	98	Paved parking, HSG A (EDA-6)
0.019	98	Unconnected roofs, HSG A (EDA-6)
0.488	36	Woods, Fair, HSG A (EDA-2A)
0.141	73	Woods, Fair, HSG C (EDA-2)
3.026	79	Woods, Fair, HSG D (EDA-2, EDA-2A)
49.624	30	Woods, Good, HSG A (EDA-1, EDA-1A, EDA-2, EDA-2A, EDA-3, EDA-3A, EDA-4, EDA-4B, EDA-5)
17.861	70	Woods, Good, HSG C (EDA-1, EDA-2, EDA-3, EDA-3A, EDA-4, EDA-4A)
7.029	77	Woods, Good, HSG D (EDA-2, EDA-2A, EDA-3, EDA-3A, EDA-4, EDA-4A, EDA-4B)
0.004	98	ex roof (EDA-5)
0.071	49	ex. 163 holliston st lawn (EDA-4B)
0.017	98	ex. roof Monego (EDA-4B)
2.579	77	wetland , HSG D (EDA-3A)
0.713	30	wetland HSG A (EDA-3A)
88.715	47	TOTAL AREA

Summary for Subcatchment EDA-1: EDA-1

Runoff = 1.19 cfs @ 12.40 hrs, Volume= 0.198 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
116,100	70	Woods, Good, HSG C
47,785	79	1 acre lots, 20% imp, HSG C
25,570	51	1 acre lots, 20% imp, HSG A
64,438	30	Woods, Good, HSG A
253,893	60	Weighted Average
239,222		94.22% Pervious Area
14,671		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
6.2	360	0.0380	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.5	410	Total			

Summary for Subcatchment EDA-1A: Flow to depression @ Partridge

Runoff = 0.04 cfs @ 12.99 hrs, Volume= 0.022 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
35,109	30	Woods, Good, HSG A
34,104	51	1 acre lots, 20% imp, HSG A
21,736	79	1 acre lots, 20% imp, HSG C
90,949	50	Weighted Average
79,781		87.72% Pervious Area
11,168		12.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.4	650	0.0430	1.04		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
20.9	700	Total			

Summary for Subcatchment EDA-2: DA-1 Northwest to Wets/Hill St

Runoff = 0.70 cfs @ 12.42 hrs, Volume= 0.140 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
70,267	70	Woods, Good, HSG C
97,291	30	Woods, Good, HSG A
23,173	77	Woods, Good, HSG D
15,000	51	1 acre lots, 20% imp, HSG A
11,000	79	1 acre lots, 20% imp, HSG C
1,983	30	Woods, Good, HSG A
37,177	79	Woods, Fair, HSG D
6,161	73	Woods, Fair, HSG C
262,052	56	Weighted Average
256,852		98.02% Pervious Area
5,200		1.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment EDA-2A: EDA-2A Flow to storage in swamp

Runoff = 0.05 cfs @ 15.94 hrs, Volume= 0.032 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
354,543	30	Woods, Good, HSG A
55,228	77	Woods, Good, HSG D
21,275	36	Woods, Fair, HSG A
94,623	79	Woods, Fair, HSG D
525,669	44	Weighted Average
525,669		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
9.4	420	0.0220	0.74		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
21.7	470	Total			

Summary for Subcatchment EDA-3: Flow to central wetland (west side)

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
547,340	30	Woods, Good, HSG A
24,107	70	Woods, Good, HSG C
60,955	77	Woods, Good, HSG D
48,400	51	1 acre lots, 20% imp, HSG A
680,802	37	Weighted Average
671,122		98.58% Pervious Area
9,680		1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment EDA-3A: Flow to central wetland east side)

Runoff = 1.65 cfs @ 12.54 hrs, Volume= 0.394 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
276,175	30	Woods, Good, HSG A
210,377	70	Woods, Good, HSG C
99,197	77	Woods, Good, HSG D
82,670	51	1 acre lots, 20% imp, HSG A
8,962	84	1 acre lots, 20% imp, HSG D
* 31,051	30	wetland HSG A
* 112,352	77	wetland , HSG D
820,784	55	Weighted Average
802,458		97.77% Pervious Area
18,326		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
3.3	158	0.0260	0.81		Shallow Concentrated Flow, bc Woodland Kv= 5.0 fps
19.6	208	Total			

Summary for Subcatchment EDA-4: Flow to east swamp

Runoff = 0.09 cfs @ 15.20 hrs, Volume= 0.059 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
326,247	30	Woods, Good, HSG A
173,077	70	Woods, Good, HSG C
32,641	77	Woods, Good, HSG D
531,965	46	Weighted Average
531,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0330	0.08		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
5.2	270	0.0300	0.87		Shallow Concentrated Flow, BC Woodland Kv= 5.0 fps
15.3	320	Total			

Summary for Subcatchment EDA-4A: Flow to east swamp(area near Fern path)

Runoff = 3.15 cfs @ 12.29 hrs, Volume= 0.359 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
184,092	70	Woods, Good, HSG C
29,657	77	Woods, Good, HSG D
213,749	71	Weighted Average
213,749		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	50	0.0150	0.06		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	180	0.0150	0.61		Shallow Concentrated Flow, BC Woodland Kv= 5.0 fps
18.7	230	Total			

Summary for Subcatchment EDA-4B: Flow to east swamp off of Holliston St

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
179,571	30	Woods, Good, HSG A
5,339	77	Woods, Good, HSG D
* 740	98	ex. roof Monego
* 3,100	49	ex. 163 holliston st lawn
2,900	49	50-75% Grass cover, Fair, HSG A
191,650	32	Weighted Average
190,910		99.61% Pervious Area
740		0.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	233	0.0500	3.60		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
17.4	283	Total			

Summary for Subcatchment EDA-5: flow to isolated wets

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
278,932	30	Woods, Good, HSG A
* 192	98	ex roof
5,000	39	>75% Grass cover, Good, HSG A
284,124	30	Weighted Average
283,932		99.93% Pervious Area
192		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	210	0.0540	3.74		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
17.2	260	Total			

Summary for Subcatchment EDA-6: Uncontrolled flow to holliston st

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

Runoff = 0.03 cfs @ 12.27 hrs, Volume= 0.005 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Adj	Description
6,980	49		50-75% Grass cover, Fair, HSG A
809	98		Unconnected roofs, HSG A
1,010	98		Paved parking, HSG A
8,799	59	57	Weighted Average, UI Adjusted
6,980			79.33% Pervious Area
1,819			20.67% Impervious Area
809			44.47% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"

Summary for Reach 3R: Drainage in Winthrop

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

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 0.12" for 2-Yr Storm event
Inflow = 0.30 cfs @ 13.18 hrs, Volume= 0.059 af
Outflow = 0.30 cfs @ 13.18 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP1: (new Reach)

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

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 0.12" for 2-Yr Storm event
Inflow = 0.33 cfs @ 13.21 hrs, Volume= 0.077 af
Outflow = 0.33 cfs @ 13.21 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream North to Hill Street

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

Inflow Area = 18.084 ac, 0.66% Impervious, Inflow Depth = 0.09" for 2-Yr Storm event
 Inflow = 0.70 cfs @ 12.42 hrs, Volume= 0.140 af
 Outflow = 0.70 cfs @ 12.42 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: Central Wetland

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

Inflow Area = 34.472 ac, 1.87% Impervious, Inflow Depth = 0.14" for 2-Yr Storm event
 Inflow = 1.65 cfs @ 12.54 hrs, Volume= 0.394 af
 Outflow = 1.65 cfs @ 12.54 hrs, Volume= 0.394 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP4: East wetland

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

Inflow Area = 21.519 ac, 0.08% Impervious, Inflow Depth = 0.23" for 2-Yr Storm event
 Inflow = 3.15 cfs @ 12.29 hrs, Volume= 0.418 af
 Outflow = 3.15 cfs @ 12.29 hrs, Volume= 0.418 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated wetland

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

Inflow Area = 6.523 ac, 0.07% Impervious, Inflow Depth = 0.00" for 2-Yr Storm event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 0.41" for 2-Yr Storm event
 Inflow = 1.19 cfs @ 12.40 hrs, Volume= 0.198 af
 Outflow = 0.40 cfs @ 13.18 hrs, Volume= 0.184 af, Atten= 67%, Lag= 46.9 min
 Discarded = 0.10 cfs @ 13.18 hrs, Volume= 0.125 af
 Primary = 0.30 cfs @ 13.18 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 260.05' @ 13.18 hrs Surf.Area= 4,196 sf Storage= 2,429 cf

Plug-Flow detention time= 219.3 min calculated for 0.184 af (93% of inflow)
Center-of-Mass det. time= 184.0 min (1,116.0 - 932.0)

Volume	Invert	Avail.Storage	Storage Description
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
259.00	850	120.0	0	0	850
261.00	9,400	360.0	8,718	8,718	10,030

Device	Routing	Invert	Outlet Devices
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	260.00'	10.0' 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

Discarded OutFlow Max=0.10 cfs @ 13.18 hrs HW=260.05' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.29 cfs @ 13.18 hrs HW=260.05' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir**(Weir Controls 0.29 cfs @ 0.58 fps)

Summary for Pond 2P: Depression @ Partridge/Winthrop

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 0.12" for 2-Yr Storm event
Inflow = 0.34 cfs @ 13.18 hrs, Volume= 0.082 af
Outflow = 0.34 cfs @ 13.21 hrs, Volume= 0.082 af, Atten= 0%, Lag= 1.9 min
Discarded = 0.01 cfs @ 13.21 hrs, Volume= 0.005 af
Primary = 0.33 cfs @ 13.21 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 254.50' @ 13.21 hrs Surf.Area= 191 sf Storage= 32 cf

Plug-Flow detention time= 2.0 min calculated for 0.081 af (100% of inflow)
Center-of-Mass det. time= 2.0 min (926.0 - 923.9)

Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
254.00	0	0.0	0	0	0
255.50	1,720	170.0	860	860	2,303
257.00	6,210	300.0	5,599	6,459	7,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	254.20'	12.0" Round Culvert L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 ' / ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.01 cfs @ 13.21 hrs HW=254.50' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 13.21 hrs HW=254.50' (Free Discharge)

↑ **2=Culvert** (Inlet Controls 0.33 cfs @ 1.65 fps)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: storage w/in Swamp PVP

Inflow Area = 12.068 ac, 0.00% Impervious, Inflow Depth = 0.03" for 2-Yr Storm event
 Inflow = 0.05 cfs @ 15.94 hrs, Volume= 0.032 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.05' @ 25.25 hrs Surf.Area= 28,809 sf Storage= 1,402 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	48,566 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	74,000	1,890.0	48,566	48,566	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.50'	50.0' long x 50.0' 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=0.00 cfs @ 0.00 hrs HW=274.00' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment EDA-1: EDA-1

Runoff = 4.63 cfs @ 12.30 hrs, Volume= 0.549 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
116,100	70	Woods, Good, HSG C
47,785	79	1 acre lots, 20% imp, HSG C
25,570	51	1 acre lots, 20% imp, HSG A
64,438	30	Woods, Good, HSG A
253,893	60	Weighted Average
239,222		94.22% Pervious Area
14,671		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
6.2	360	0.0380	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.5	410	Total			

Summary for Subcatchment EDA-1A: Flow to depression @ Partridge

Runoff = 0.56 cfs @ 12.45 hrs, Volume= 0.100 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
35,109	30	Woods, Good, HSG A
34,104	51	1 acre lots, 20% imp, HSG A
21,736	79	1 acre lots, 20% imp, HSG C
90,949	50	Weighted Average
79,781		87.72% Pervious Area
11,168		12.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.4	650	0.0430	1.04		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
20.9	700	Total			

Summary for Subcatchment EDA-2: DA-1 Northwest to Wets/Hill St

Runoff = 3.84 cfs @ 12.22 hrs, Volume= 0.447 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
70,267	70	Woods, Good, HSG C
97,291	30	Woods, Good, HSG A
23,173	77	Woods, Good, HSG D
15,000	51	1 acre lots, 20% imp, HSG A
11,000	79	1 acre lots, 20% imp, HSG C
1,983	30	Woods, Good, HSG A
37,177	79	Woods, Fair, HSG D
6,161	73	Woods, Fair, HSG C
262,052	56	Weighted Average
256,852		98.02% Pervious Area
5,200		1.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment EDA-2A: EDA-2A Flow to storage in swamp

Runoff = 1.09 cfs @ 12.60 hrs, Volume= 0.314 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
354,543	30	Woods, Good, HSG A
55,228	77	Woods, Good, HSG D
21,275	36	Woods, Fair, HSG A
94,623	79	Woods, Fair, HSG D
525,669	44	Weighted Average
525,669		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
9.4	420	0.0220	0.74		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
21.7	470	Total			

Summary for Subcatchment EDA-3: Flow to central wetland (west side)

Runoff = 0.19 cfs @ 15.10 hrs, Volume= 0.119 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
547,340	30	Woods, Good, HSG A
24,107	70	Woods, Good, HSG C
60,955	77	Woods, Good, HSG D
48,400	51	1 acre lots, 20% imp, HSG A
680,802	37	Weighted Average
671,122		98.58% Pervious Area
9,680		1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment EDA-3A: Flow to central wetland east side)

Runoff = 9.47 cfs @ 12.35 hrs, Volume= 1.311 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
276,175	30	Woods, Good, HSG A
210,377	70	Woods, Good, HSG C
99,197	77	Woods, Good, HSG D
82,670	51	1 acre lots, 20% imp, HSG A
8,962	84	1 acre lots, 20% imp, HSG D
* 31,051	30	wetland HSG A
* 112,352	77	wetland , HSG D
820,784	55	Weighted Average
802,458		97.77% Pervious Area
18,326		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, ab
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.3	158	0.0260	0.81		Shallow Concentrated Flow, bc
					Woodland Kv= 5.0 fps
19.6	208	Total			

Summary for Subcatchment EDA-4: Flow to east swamp

Runoff = 1.88 cfs @ 12.46 hrs, Volume= 0.400 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
326,247	30	Woods, Good, HSG A
173,077	70	Woods, Good, HSG C
32,641	77	Woods, Good, HSG D
531,965	46	Weighted Average
531,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0330	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
5.2	270	0.0300	0.87		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
15.3	320	Total			

Summary for Subcatchment EDA-4A: Flow to east swamp(area near Fern path)

Runoff = 7.35 cfs @ 12.27 hrs, Volume= 0.774 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
184,092	70	Woods, Good, HSG C
29,657	77	Woods, Good, HSG D
213,749	71	Weighted Average
213,749		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	50	0.0150	0.06		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	180	0.0150	0.61		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
18.7	230	Total			

Summary for Subcatchment EDA-4B: Flow to east swamp off of Holliston St

Runoff = 0.01 cfs @ 23.03 hrs, Volume= 0.003 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
179,571	30	Woods, Good, HSG A
5,339	77	Woods, Good, HSG D
* 740	98	ex. roof Monego
* 3,100	49	ex. 163 holliston st lawn
2,900	49	50-75% Grass cover, Fair, HSG A
191,650	32	Weighted Average
190,910		99.61% Pervious Area
740		0.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	233	0.0500	3.60		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
17.4	283	Total			

Summary for Subcatchment EDA-5: flow to isolated wets

Runoff = 0.00 cfs @ 24.09 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
278,932	30	Woods, Good, HSG A
* 192	98	ex roof
5,000	39	>75% Grass cover, Good, HSG A
284,124	30	Weighted Average
283,932		99.93% Pervious Area
192		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	210	0.0540	3.74		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
17.2	260	Total			

Summary for Subcatchment EDA-6: Uncontrolled flow to holliston st

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

Runoff = 0.18 cfs @ 12.11 hrs, Volume= 0.016 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Adj	Description
6,980	49		50-75% Grass cover, Fair, HSG A
809	98		Unconnected roofs, HSG A
1,010	98		Paved parking, HSG A
8,799	59	57	Weighted Average, UI Adjusted
6,980			79.33% Pervious Area
1,819			20.67% Impervious Area
809			44.47% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"

Summary for Reach 3R: Drainage in Winthrop

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

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 0.82" for 10-Yr Storm event
 Inflow = 3.89 cfs @ 12.44 hrs, Volume= 0.396 af
 Outflow = 3.89 cfs @ 12.44 hrs, Volume= 0.396 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP1: (new Reach)

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

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 0.73" for 10-Yr Storm event
 Inflow = 3.42 cfs @ 12.62 hrs, Volume= 0.480 af
 Outflow = 3.42 cfs @ 12.62 hrs, Volume= 0.480 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream North to Hill Street

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

Inflow Area = 18.084 ac, 0.66% Impervious, Inflow Depth = 0.30" for 10-Yr Storm event
 Inflow = 3.84 cfs @ 12.22 hrs, Volume= 0.447 af
 Outflow = 3.84 cfs @ 12.22 hrs, Volume= 0.447 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: Central Wetland

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

Inflow Area = 34.472 ac, 1.87% Impervious, Inflow Depth = 0.50" for 10-Yr Storm event
 Inflow = 9.47 cfs @ 12.35 hrs, Volume= 1.430 af
 Outflow = 9.47 cfs @ 12.35 hrs, Volume= 1.430 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP4: East wetland

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

Inflow Area = 21.519 ac, 0.08% Impervious, Inflow Depth = 0.66" for 10-Yr Storm event
 Inflow = 8.67 cfs @ 12.30 hrs, Volume= 1.177 af
 Outflow = 8.67 cfs @ 12.30 hrs, Volume= 1.177 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated wetland

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

Inflow Area = 6.523 ac, 0.07% Impervious, Inflow Depth = 0.00" for 10-Yr Storm event
 Inflow = 0.00 cfs @ 24.09 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 24.09 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 1.13" for 10-Yr Storm event
 Inflow = 4.63 cfs @ 12.30 hrs, Volume= 0.549 af
 Outflow = 4.01 cfs @ 12.44 hrs, Volume= 0.531 af, Atten= 13%, Lag= 8.3 min
 Discarded = 0.12 cfs @ 12.44 hrs, Volume= 0.135 af
 Primary = 3.89 cfs @ 12.44 hrs, Volume= 0.396 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.28' @ 12.43 hrs Surf.Area= 5,275 sf Storage= 3,524 cf

Plug-Flow detention time=85.6 min calculated for 0.531 af (97% of inflow)
 Center-of-Mass det. time= 68.2 min (960.0 - 891.8)

Volume	Invert	Avail.Storage	Storage Description
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)

OE2765-PRE-7.11.17

Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
259.00	850	120.0	0	0	850
261.00	9,400	360.0	8,718	8,718	10,030

Device	Routing	Invert	Outlet Devices
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	260.00'	10.0' 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

Discarded OutFlow Max=0.12 cfs @ 12.44 hrs HW=260.28' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.12 cfs)**Primary OutFlow** Max=3.87 cfs @ 12.44 hrs HW=260.28' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Weir Controls 3.87 cfs @ 1.37 fps)**Summary for Pond 2P: Depression @ Partridge/Winthrop**

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 0.75" for 10-Yr Storm event
 Inflow = 4.45 cfs @ 12.44 hrs, Volume= 0.496 af
 Outflow = 3.55 cfs @ 12.62 hrs, Volume= 0.496 af, Atten= 20%, Lag= 11.1 min
 Discarded = 0.13 cfs @ 12.62 hrs, Volume= 0.016 af
 Primary = 3.42 cfs @ 12.62 hrs, Volume= 0.480 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 255.75' @ 12.62 hrs Surf.Area= 2,283 sf Storage= 1,365 cf

Plug-Flow detention time= 2.9 min calculated for 0.495 af (100% of inflow)
 Center-of-Mass det. time= 2.9 min (888.8 - 885.8)

Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
254.00	0	0.0	0	0	0
255.50	1,720	170.0	860	860	2,303
257.00	6,210	300.0	5,599	6,459	7,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	254.20'	12.0" Round Culvert L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 ' / S= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.13 cfs @ 12.62 hrs HW=255.75' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=3.42 cfs @ 12.62 hrs HW=255.75' (Free Discharge)

↑ **2=Culvert** (Inlet Controls 3.42 cfs @ 4.35 fps)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: storage w/in Swamp PVP

Inflow Area = 12.068 ac, 0.00% Impervious, Inflow Depth = 0.31" for 10-Yr Storm event
 Inflow = 1.09 cfs @ 12.60 hrs, Volume= 0.314 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.39' @ 25.25 hrs Surf.Area= 42,791 sf Storage= 13,664 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	48,566 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	74,000	1,890.0	48,566	48,566	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.50'	50.0' long x 50.0' 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=0.00 cfs @ 0.00 hrs HW=274.00' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment EDA-1: EDA-1

Runoff = 6.96 cfs @ 12.28 hrs, Volume= 0.778 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
116,100	70	Woods, Good, HSG C
47,785	79	1 acre lots, 20% imp, HSG C
25,570	51	1 acre lots, 20% imp, HSG A
64,438	30	Woods, Good, HSG A
253,893	60	Weighted Average
239,222		94.22% Pervious Area
14,671		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
6.2	360	0.0380	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.5	410	Total			

Summary for Subcatchment EDA-1A: Flow to depression @ Partridge

Runoff = 1.07 cfs @ 12.38 hrs, Volume= 0.158 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
35,109	30	Woods, Good, HSG A
34,104	51	1 acre lots, 20% imp, HSG A
21,736	79	1 acre lots, 20% imp, HSG C
90,949	50	Weighted Average
79,781		87.72% Pervious Area
11,168		12.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.4	650	0.0430	1.04		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
20.9	700	Total			

Summary for Subcatchment EDA-2: DA-1 Northwest to Wets/Hill St

Runoff = 6.26 cfs @ 12.21 hrs, Volume= 0.656 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
70,267	70	Woods, Good, HSG C
97,291	30	Woods, Good, HSG A
23,173	77	Woods, Good, HSG D
15,000	51	1 acre lots, 20% imp, HSG A
11,000	79	1 acre lots, 20% imp, HSG C
1,983	30	Woods, Good, HSG A
37,177	79	Woods, Fair, HSG D
6,161	73	Woods, Fair, HSG C
262,052	56	Weighted Average
256,852		98.02% Pervious Area
5,200		1.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment EDA-2A: EDA-2A Flow to storage in swamp

Runoff = 2.76 cfs @ 12.51 hrs, Volume= 0.560 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
354,543	30	Woods, Good, HSG A
55,228	77	Woods, Good, HSG D
21,275	36	Woods, Fair, HSG A
94,623	79	Woods, Fair, HSG D
525,669	44	Weighted Average
525,669		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
9.4	420	0.0220	0.74		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
21.7	470	Total			

Summary for Subcatchment EDA-3: Flow to central wetland (west side)

Runoff = 0.62 cfs @ 12.61 hrs, Volume= 0.299 af, Depth= 0.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
547,340	30	Woods, Good, HSG A
24,107	70	Woods, Good, HSG C
60,955	77	Woods, Good, HSG D
48,400	51	1 acre lots, 20% imp, HSG A
680,802	37	Weighted Average
671,122		98.58% Pervious Area
9,680		1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment EDA-3A: Flow to central wetland east side)

Runoff = 15.71 cfs @ 12.32 hrs, Volume= 1.946 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
276,175	30	Woods, Good, HSG A
210,377	70	Woods, Good, HSG C
99,197	77	Woods, Good, HSG D
82,670	51	1 acre lots, 20% imp, HSG A
8,962	84	1 acre lots, 20% imp, HSG D
* 31,051	30	wetland HSG A
* 112,352	77	wetland , HSG D
820,784	55	Weighted Average
802,458		97.77% Pervious Area
18,326		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, ab
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.3	158	0.0260	0.81		Shallow Concentrated Flow, bc
					Woodland Kv= 5.0 fps
19.6	208	Total			

Summary for Subcatchment EDA-4: Flow to east swamp

Runoff = 4.12 cfs @ 12.36 hrs, Volume= 0.679 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
326,247	30	Woods, Good, HSG A
173,077	70	Woods, Good, HSG C
32,641	77	Woods, Good, HSG D
531,965	46	Weighted Average
531,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0330	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
5.2	270	0.0300	0.87		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
15.3	320	Total			

Summary for Subcatchment EDA-4A: Flow to east swamp(area near Fern path)

Runoff = 9.85 cfs @ 12.27 hrs, Volume= 1.023 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
184,092	70	Woods, Good, HSG C
29,657	77	Woods, Good, HSG D
213,749	71	Weighted Average
213,749		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	50	0.0150	0.06		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	180	0.0150	0.61		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
18.7	230	Total			

Summary for Subcatchment EDA-4B: Flow to east swamp off of Holliston St

Runoff = 0.04 cfs @ 15.63 hrs, Volume= 0.025 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

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Type III 24-Hr 25-Yr Storm Rainfall=5.50"

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Area (sf)	CN	Description
179,571	30	Woods, Good, HSG A
5,339	77	Woods, Good, HSG D
* 740	98	ex. roof Monego
* 3,100	49	ex. 163 holliston st lawn
2,900	49	50-75% Grass cover, Fair, HSG A
191,650	32	Weighted Average
190,910		99.61% Pervious Area
740		0.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	233	0.0500	3.60		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
17.4	283	Total			

Summary for Subcatchment EDA-5: flow to isolated wets

Runoff = 0.02 cfs @ 21.25 hrs, Volume= 0.016 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Description
278,932	30	Woods, Good, HSG A
* 192	98	ex roof
5,000	39	>75% Grass cover, Good, HSG A
284,124	30	Weighted Average
283,932		99.93% Pervious Area
192		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	210	0.0540	3.74		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
17.2	260	Total			

Summary for Subcatchment EDA-6: Uncontrolled flow to holliston st

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

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.023 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-Yr Storm Rainfall=5.50"

Area (sf)	CN	Adj	Description
6,980	49		50-75% Grass cover, Fair, HSG A
809	98		Unconnected roofs, HSG A
1,010	98		Paved parking, HSG A
8,799	59	57	Weighted Average, UI Adjusted
6,980			79.33% Pervious Area
1,819			20.67% Impervious Area
809			44.47% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"

Summary for Reach 3R: Drainage in Winthrop

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

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 1.28" for 25-Yr Storm event
 Inflow = 6.34 cfs @ 12.37 hrs, Volume= 0.621 af
 Outflow = 6.34 cfs @ 12.37 hrs, Volume= 0.621 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP1: (new Reach)

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

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 1.15" for 25-Yr Storm event
 Inflow = 7.03 cfs @ 12.46 hrs, Volume= 0.756 af
 Outflow = 7.03 cfs @ 12.46 hrs, Volume= 0.756 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream North to Hill Street

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

Inflow Area = 18.084 ac, 0.66% Impervious, Inflow Depth > 0.53" for 25-Yr Storm event
 Inflow = 6.26 cfs @ 12.21 hrs, Volume= 0.794 af
 Outflow = 6.26 cfs @ 12.21 hrs, Volume= 0.794 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: Central Wetland

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

Inflow Area = 34.472 ac, 1.87% Impervious, Inflow Depth = 0.78" for 25-Yr Storm event
 Inflow = 15.77 cfs @ 12.32 hrs, Volume= 2.245 af
 Outflow = 15.77 cfs @ 12.32 hrs, Volume= 2.245 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP4: East wetland

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

Inflow Area = 21.519 ac, 0.08% Impervious, Inflow Depth = 0.96" for 25-Yr Storm event
 Inflow = 13.74 cfs @ 12.29 hrs, Volume= 1.727 af
 Outflow = 13.74 cfs @ 12.29 hrs, Volume= 1.727 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated wetland

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

Inflow Area = 6.523 ac, 0.07% Impervious, Inflow Depth = 0.03" for 25-Yr Storm event
 Inflow = 0.02 cfs @ 21.25 hrs, Volume= 0.016 af
 Outflow = 0.02 cfs @ 21.25 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 1.60" for 25-Yr Storm event
 Inflow = 6.96 cfs @ 12.28 hrs, Volume= 0.778 af
 Outflow = 6.47 cfs @ 12.37 hrs, Volume= 0.760 af, Atten= 7%, Lag= 5.2 min
 Discarded = 0.14 cfs @ 12.37 hrs, Volume= 0.139 af
 Primary = 6.34 cfs @ 12.37 hrs, Volume= 0.621 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.39' @ 12.37 hrs Surf.Area= 5,810 sf Storage= 4,111 cf

Plug-Flow detention time=62.4 min calculated for 0.760 af (98% of inflow)
 Center-of-Mass det. time= 49.6 min (929.7 - 880.2)

Volume	Invert	Avail.Storage	Storage Description
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-Hr 25-Yr Storm Rainfall=5.50"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
259.00	850	120.0	0	0	850
261.00	9,400	360.0	8,718	8,718	10,030

Device	Routing	Invert	Outlet Devices
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	260.00'	10.0' 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

Discarded OutFlow Max=0.14 cfs @ 12.37 hrs HW=260.39' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.14 cfs)**Primary OutFlow** Max=6.28 cfs @ 12.37 hrs HW=260.39' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Weir Controls 6.28 cfs @ 1.63 fps)**Summary for Pond 2P: Depression @ Partridge/Winthrop**

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 1.18" for 25-Yr Storm event
 Inflow = 7.41 cfs @ 12.37 hrs, Volume= 0.779 af
 Outflow = 7.21 cfs @ 12.46 hrs, Volume= 0.779 af, Atten= 3%, Lag= 5.3 min
 Discarded = 0.18 cfs @ 12.46 hrs, Volume= 0.024 af
 Primary = 7.03 cfs @ 12.46 hrs, Volume= 0.756 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 256.12' @ 12.46 hrs Surf.Area= 3,234 sf Storage= 2,367 cf

Plug-Flow detention time= 3.9 min calculated for 0.779 af (100% of inflow)
 Center-of-Mass det. time= 3.8 min (881.8 - 877.9)

Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
254.00	0	0.0	0	0	0
255.50	1,720	170.0	860	860	2,303
257.00	6,210	300.0	5,599	6,459	7,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	254.20'	12.0" Round Culvert L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 ' / S= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.18 cfs @ 12.46 hrs HW=256.12' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=6.91 cfs @ 12.46 hrs HW=256.12' (Free Discharge)

↑ **2=Culvert** (Inlet Controls 3.97 cfs @ 5.05 fps)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 2.94 cfs @ 0.85 fps)

Summary for Pond 3P: storage w/in Swamp PVP

Inflow Area = 12.068 ac, 0.00% Impervious, Inflow Depth = 0.56" for 25-Yr Storm event
 Inflow = 2.76 cfs @ 12.51 hrs, Volume= 0.560 af
 Outflow = 0.29 cfs @ 20.03 hrs, Volume= 0.137 af, Atten= 90%, Lag= 451.1 min
 Primary = 0.29 cfs @ 20.03 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.52' @ 20.03 hrs Surf.Area= 48,367 sf Storage= 19,188 cf

Plug-Flow detention time=548.1 min calculated for 0.137 af (24% of inflow)

Center-of-Mass det. time= 352.2 min (1,303.3 - 951.1)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	48,566 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	74,000	1,890.0	48,566	48,566	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.50'	50.0' long x 50.0' 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=0.28 cfs @ 20.03 hrs HW=274.52' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.28 cfs @ 0.34 fps)

Summary for Subcatchment EDA-1: EDA-1

Runoff = 10.89 cfs @ 12.27 hrs, Volume= 1.163 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
116,100	70	Woods, Good, HSG C
47,785	79	1 acre lots, 20% imp, HSG C
25,570	51	1 acre lots, 20% imp, HSG A
64,438	30	Woods, Good, HSG A
253,893	60	Weighted Average
239,222		94.22% Pervious Area
14,671		5.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
6.2	360	0.0380	0.97		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.5	410	Total			

Summary for Subcatchment EDA-1A: Flow to depression @ Partridge

Runoff = 2.05 cfs @ 12.34 hrs, Volume= 0.261 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
35,109	30	Woods, Good, HSG A
34,104	51	1 acre lots, 20% imp, HSG A
21,736	79	1 acre lots, 20% imp, HSG C
90,949	50	Weighted Average
79,781		87.72% Pervious Area
11,168		12.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
10.4	650	0.0430	1.04		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
20.9	700	Total			

Summary for Subcatchment EDA-2: DA-1 Northwest to Wets/Hill St

Runoff = 10.41 cfs @ 12.20 hrs, Volume= 1.015 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
70,267	70	Woods, Good, HSG C
97,291	30	Woods, Good, HSG A
23,173	77	Woods, Good, HSG D
15,000	51	1 acre lots, 20% imp, HSG A
11,000	79	1 acre lots, 20% imp, HSG C
1,983	30	Woods, Good, HSG A
37,177	79	Woods, Fair, HSG D
6,161	73	Woods, Fair, HSG C
262,052	56	Weighted Average
256,852		98.02% Pervious Area
5,200		1.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment EDA-2A: EDA-2A Flow to storage in swamp

Runoff = 6.61 cfs @ 12.41 hrs, Volume= 1.028 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
354,543	30	Woods, Good, HSG A
55,228	77	Woods, Good, HSG D
21,275	36	Woods, Fair, HSG A
94,623	79	Woods, Fair, HSG D
525,669	44	Weighted Average
525,669		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
9.4	420	0.0220	0.74		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
21.7	470	Total			

Summary for Subcatchment EDA-3: Flow to central wetland (west side)

Runoff = 3.20 cfs @ 12.46 hrs, Volume= 0.696 af, Depth= 0.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
547,340	30	Woods, Good, HSG A
24,107	70	Woods, Good, HSG C
60,955	77	Woods, Good, HSG D
48,400	51	1 acre lots, 20% imp, HSG A
680,802	37	Weighted Average
671,122		98.58% Pervious Area
9,680		1.42% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment EDA-3A: Flow to central wetland east side)

Runoff = 26.54 cfs @ 12.30 hrs, Volume= 3.040 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
276,175	30	Woods, Good, HSG A
210,377	70	Woods, Good, HSG C
99,197	77	Woods, Good, HSG D
82,670	51	1 acre lots, 20% imp, HSG A
8,962	84	1 acre lots, 20% imp, HSG D
* 31,051	30	wetland HSG A
* 112,352	77	wetland , HSG D
820,784	55	Weighted Average
802,458		97.77% Pervious Area
18,326		2.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, ab
					Woods: Light underbrush n= 0.400 P2= 3.20"
3.3	158	0.0260	0.81		Shallow Concentrated Flow, bc
					Woodland Kv= 5.0 fps
19.6	208	Total			

Summary for Subcatchment EDA-4: Flow to east swamp

Runoff = 9.39 cfs @ 12.27 hrs, Volume= 1.198 af, Depth= 1.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
326,247	30	Woods, Good, HSG A
173,077	70	Woods, Good, HSG C
32,641	77	Woods, Good, HSG D
531,965	46	Weighted Average
531,965		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	50	0.0330	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
5.2	270	0.0300	0.87		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
15.3	320	Total			

Summary for Subcatchment EDA-4A: Flow to east swamp(area near Fern path)

Runoff = 13.79 cfs @ 12.26 hrs, Volume= 1.420 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
184,092	70	Woods, Good, HSG C
29,657	77	Woods, Good, HSG D
213,749	71	Weighted Average
213,749		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.8	50	0.0150	0.06		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
4.9	180	0.0150	0.61		Shallow Concentrated Flow, BC
					Woodland Kv= 5.0 fps
18.7	230	Total			

Summary for Subcatchment EDA-4B: Flow to east swamp off of Holliston St

Runoff = 0.16 cfs @ 13.00 hrs, Volume= 0.093 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
179,571	30	Woods, Good, HSG A
5,339	77	Woods, Good, HSG D
* 740	98	ex. roof Monego
* 3,100	49	ex. 163 holliston st lawn
2,900	49	50-75% Grass cover, Fair, HSG A
191,650	32	Weighted Average
190,910		99.61% Pervious Area
740		0.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
1.1	233	0.0500	3.60		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
17.4	283	Total			

Summary for Subcatchment EDA-5: flow to isolated wets

Runoff = 0.14 cfs @ 14.90 hrs, Volume= 0.089 af, Depth= 0.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
278,932	30	Woods, Good, HSG A
* 192	98	ex roof
5,000	39	>75% Grass cover, Good, HSG A
284,124	30	Weighted Average
283,932		99.93% Pervious Area
192		0.07% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
0.9	210	0.0540	3.74		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
17.2	260	Total			

Summary for Subcatchment EDA-6: Uncontrolled flow to holliston st

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

Runoff = 0.47 cfs @ 12.10 hrs, Volume= 0.036 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Adj	Description
6,980	49		50-75% Grass cover, Fair, HSG A
809	98		Unconnected roofs, HSG A
1,010	98		Paved parking, HSG A
8,799	59	57	Weighted Average, UI Adjusted
6,980			79.33% Pervious Area
1,819			20.67% Impervious Area
809			44.47% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"

Summary for Reach 3R: Drainage in Winthrop

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

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 2.06" for 100-Yr Storm event
 Inflow = 10.16 cfs @ 12.34 hrs, Volume= 0.999 af
 Outflow = 10.16 cfs @ 12.34 hrs, Volume= 0.999 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP1: (new Reach)

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

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 1.86" for 100-Yr Storm event
 Inflow = 11.94 cfs @ 12.36 hrs, Volume= 1.228 af
 Outflow = 11.94 cfs @ 12.36 hrs, Volume= 1.228 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream North to Hill Street

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

Inflow Area = 18.084 ac, 0.66% Impervious, Inflow Depth = 1.08" for 100-Yr Storm event
 Inflow = 10.41 cfs @ 12.20 hrs, Volume= 1.621 af
 Outflow = 10.41 cfs @ 12.20 hrs, Volume= 1.621 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP3: Central Wetland

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

Inflow Area = 34.472 ac, 1.87% Impervious, Inflow Depth = 1.30" for 100-Yr Storm event
 Inflow = 29.08 cfs @ 12.32 hrs, Volume= 3.735 af
 Outflow = 29.08 cfs @ 12.32 hrs, Volume= 3.735 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP4: East wetland

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

Inflow Area = 21.519 ac, 0.08% Impervious, Inflow Depth = 1.51" for 100-Yr Storm event
 Inflow = 23.17 cfs @ 12.27 hrs, Volume= 2.711 af
 Outflow = 23.17 cfs @ 12.27 hrs, Volume= 2.711 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated wetland

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

Inflow Area = 6.523 ac, 0.07% Impervious, Inflow Depth = 0.16" for 100-Yr Storm event
 Inflow = 0.14 cfs @ 14.90 hrs, Volume= 0.089 af
 Outflow = 0.14 cfs @ 14.90 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.829 ac, 5.78% Impervious, Inflow Depth = 2.39" for 100-Yr Storm event
 Inflow = 10.89 cfs @ 12.27 hrs, Volume= 1.163 af
 Outflow = 10.31 cfs @ 12.34 hrs, Volume= 1.144 af, Atten= 5%, Lag= 4.1 min
 Discarded = 0.15 cfs @ 12.34 hrs, Volume= 0.145 af
 Primary = 10.16 cfs @ 12.34 hrs, Volume= 0.999 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.53' @ 12.34 hrs Surf.Area= 6,537 sf Storage= 4,953 cf

Plug-Flow detention time=43.7 min calculated for 1.142 af (98% of inflow)
 Center-of-Mass det. time= 35.3 min (902.9 - 867.7)

Volume	Invert	Avail.Storage	Storage Description
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)

OE2765-PRE-7.11.17

Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
259.00	850	120.0	0	0	850
261.00	9,400	360.0	8,718	8,718	10,030

Device	Routing	Invert	Outlet Devices
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area
#2	Primary	260.00'	10.0' 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

Discarded OutFlow Max=0.15 cfs @ 12.34 hrs HW=260.52' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.15 cfs)**Primary OutFlow** Max=10.12 cfs @ 12.34 hrs HW=260.52' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Weir Controls 10.12 cfs @ 1.93 fps)**Summary for Pond 2P: Depression @ Partrige/Winthrop**

Inflow Area = 7.916 ac, 7.49% Impervious, Inflow Depth = 1.91" for 100-Yr Storm event
 Inflow = 12.21 cfs @ 12.34 hrs, Volume= 1.260 af
 Outflow = 12.14 cfs @ 12.36 hrs, Volume= 1.260 af, Atten= 1%, Lag= 0.8 min
 Discarded = 0.20 cfs @ 12.36 hrs, Volume= 0.033 af
 Primary = 11.94 cfs @ 12.36 hrs, Volume= 1.228 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 256.22' @ 12.36 hrs Surf.Area= 3,532 sf Storage= 2,716 cf

Plug-Flow detention time= 3.6 min calculated for 1.258 af (100% of inflow)
 Center-of-Mass det. time= 3.6 min (872.5 - 868.9)

Volume	Invert	Avail.Storage	Storage Description
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
254.00	0	0.0	0	0	0
255.50	1,720	170.0	860	860	2,303
257.00	6,210	300.0	5,599	6,459	7,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	254.20'	12.0" Round Culvert L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 ' / S= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.20 cfs @ 12.36 hrs HW=256.22' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=11.91 cfs @ 12.36 hrs HW=256.22' (Free Discharge)

↑ **2=Culvert** (Inlet Controls 4.12 cfs @ 5.24 fps)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 7.80 cfs @ 1.17 fps)

Summary for Pond 3P: storage w/in Swamp PVP

Inflow Area = 12.068 ac, 0.00% Impervious, Inflow Depth = 1.02" for 100-Yr Storm event
 Inflow = 6.61 cfs @ 12.41 hrs, Volume= 1.028 af
 Outflow = 1.33 cfs @ 14.45 hrs, Volume= 0.606 af, Atten= 80%, Lag= 122.0 min
 Primary = 1.33 cfs @ 14.45 hrs, Volume= 0.606 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.55' @ 14.45 hrs Surf.Area= 49,785 sf Storage= 20,647 cf

Plug-Flow detention time= 285.1 min calculated for 0.605 af (59% of inflow)

Center-of-Mass det. time= 149.5 min (1,072.5 - 923.1)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	48,566 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	74,000	1,890.0	48,566	48,566	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.50'	50.0' long x 50.0' 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=1.32 cfs @ 14.45 hrs HW=274.55' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 1.32 cfs @ 0.57 fps)

Appendix D-2

Post-Development Hydrology Calculations (Standard #2)

OE2675-POST-WEST-NORTH-7.11.17

Prepared by Microsoft

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.227	49	50-75% Grass cover, Fair, HSG A (PDA1)
0.173	79	50-75% Grass cover, Fair, HSG C (PDA1)
6.369	39	>75% Grass cover, Good, HSG A (PDA10, PDA2, PDA3, PDA3A, PDA3B, PDA4, PDA6, PDA7, PDA8)
3.877	74	>75% Grass cover, Good, HSG C (1S, PDA10, PDA2, PDA5, PDA6, PDA7)
0.028	80	>75% Grass cover, Good, HSG D (PDA4)
1.517	35	Brush, Fair, HSG A (PDA9)
0.003	98	Ex. Roofs, HSG A (PDA5)
0.062	96	Gravel surface, HSG A (PDA9)
1.038	98	Paved parking, HSG A (PDA8)
1.495	98	Paved parking, HSG C (PDA6, PDA7)
0.147	98	Pavement, HSG C (1S)
3.415	79	Woods, Fair, HSG D (PDA4)
8.471	30	Woods, Good, HSG A (PDA1, PDA10, PDA2, PDA3, PDA4, PDA6)
1.123	70	Woods, Good, HSG C (1S, PDA1, PDA10, PDA2, PDA5, PDA6)
1.397	77	Woods, Good, HSG D (PDA10)
1.069	43	Woods/grass comb., Fair, HSG A (PDA10, PDA8)
0.089	76	Woods/grass comb., Fair, HSG C (PDA10)
0.048	98	ex roof (PDA10, PDA3, PDA9)
0.172	98	ex roof and drive (PDA2)
0.014	98	ex. roof (PDA1)
30.736	54	TOTAL AREA

Summary for Subcatchment 1S: PDA 1A

Runoff = 1.15 cfs @ 12.10 hrs, Volume= 0.085 af, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
*	6,400	98	Pavement, HSG C
	26,056	74	>75% Grass cover, Good, HSG C
	2,400	70	Woods, Good, HSG C
	34,856	78	Weighted Average
	28,456		81.64% Pervious Area
	6,400		18.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, min. Tc per TR-55

Summary for Subcatchment PDA1:

Runoff = 0.14 cfs @ 12.20 hrs, Volume= 0.024 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

	Area (sf)	CN	Description
	10,712	70	Woods, Good, HSG C
	9,898	49	50-75% Grass cover, Fair, HSG A
	7,602	30	Woods, Good, HSG A
*	621	98	ex. roof
	7,527	79	50-75% Grass cover, Fair, HSG C
	36,360	58	Weighted Average
	35,739		98.29% Pervious Area
	621		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.8	300	Total			

Summary for Subcatchment PDA10: Remaining NW land to Hill st.

Runoff = 0.48 cfs @ 12.45 hrs, Volume= 0.104 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
26,256	43	Woods/grass comb., Fair, HSG A
3,882	76	Woods/grass comb., Fair, HSG C
* 885	98	ex roof
9,905	39	>75% Grass cover, Good, HSG A
21,520	74	>75% Grass cover, Good, HSG C
69,434	30	Woods, Good, HSG A
24,449	70	Woods, Good, HSG C
60,851	77	Woods, Good, HSG D
217,182	55	Weighted Average
216,297		99.59% Pervious Area
885		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment PDA2: Flow to W. St Culvert

Runoff = 0.04 cfs @ 12.49 hrs, Volume= 0.017 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
* 7,500	98	ex roof and drive
25,390	39	>75% Grass cover, Good, HSG A
11,331	74	>75% Grass cover, Good, HSG C
21,304	30	Woods, Good, HSG A
4,730	70	Woods, Good, HSG C
70,255	50	Weighted Average
62,755		89.32% Pervious Area
7,500		10.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0360	0.19		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
2.1	485	0.0560	3.81		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
6.5	535	Total			

Summary for Subcatchment PDA3: Uncontrolled

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
* 192	98	ex roof
28,475	39	>75% Grass cover, Good, HSG A
157,675	30	Woods, Good, HSG A
186,342	31	Weighted Average
186,150		99.90% Pervious Area
192		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.4	160	0.0500	1.12		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
18.7	210	Total			

Summary for Subcatchment PDA3A: All RD

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
17,000	39	>75% Grass cover, Good, HSG A
17,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA3B: All RD

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
8,800	39	>75% Grass cover, Good, HSG A
8,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA4: Remaining Flow to Swamp

Runoff = 0.71 cfs @ 12.39 hrs, Volume= 0.147 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
50,626	39	>75% Grass cover, Good, HSG A
1,238	80	>75% Grass cover, Good, HSG D
105,623	30	Woods, Good, HSG A
148,756	79	Woods, Fair, HSG D
306,243	55	Weighted Average
306,243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		Sheet Flow, Range n= 0.130 P2= 3.20"
4.3	420	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.3	470	Total			

Summary for Subcatchment PDA5:

Runoff = 0.95 cfs @ 12.14 hrs, Volume= 0.080 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

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Type III 24-hr 2-year Rainfall=3.20"

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Area (sf)	CN	Description
4,700	70	Woods, Good, HSG C
35,575	74	>75% Grass cover, Good, HSG C
* 140	98	Ex. Roofs, HSG A
40,415	74	Weighted Average
40,275		99.65% Pervious Area
140		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	110	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
8.7	160	Total			

Summary for Subcatchment PDA6:

Runoff = 1.68 cfs @ 12.15 hrs, Volume= 0.164 af, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
47,858	74	>75% Grass cover, Good, HSG C
32,000	98	Paved parking, HSG C
44,462	39	>75% Grass cover, Good, HSG A
7,348	30	Woods, Good, HSG A
1,947	70	Woods, Good, HSG C
133,615	66	Weighted Average
101,615		76.05% Pervious Area
32,000		23.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.9	127	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
1.2	475	0.0220	6.73	5.28	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.5	752	Total			

Summary for Subcatchment PDA7:

Runoff = 1.62 cfs @ 12.18 hrs, Volume= 0.154 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
33,130	98	Paved parking, HSG C
26,805	39	>75% Grass cover, Good, HSG A
26,539	74	>75% Grass cover, Good, HSG C
86,474	72	Weighted Average
53,344		61.69% Pervious Area
33,130		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	191	0.0400	3.22		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
1.5	480	0.0100	5.36	4.21	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.011 Concrete pipe, straight & clean
11.8	721	Total			

Summary for Subcatchment PDA8:

Runoff = 0.62 cfs @ 12.39 hrs, Volume= 0.103 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
45,227	98	Paved parking, HSG A
65,958	39	>75% Grass cover, Good, HSG A
20,305	43	Woods/grass comb., Fair, HSG A
131,490	60	Weighted Average
86,263		65.60% Pervious Area
45,227		34.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0120	0.06		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	239	0.0190	2.22		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	80	0.0070	1.70		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.2	47	0.0100	4.54	3.56	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
17.9	416	Total			

Summary for Subcatchment PDA9:

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.20"

Area (sf)	CN	Description
2,689	96	Gravel surface, HSG A
* 1,035	98	ex roof
66,090	35	Brush, Fair, HSG A
69,814	38	Weighted Average
68,779		98.52% Pervious Area
1,035		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
4.5	430	0.0100	1.61		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
12.0	480	Total			

Summary for Reach 1R: Drainage in Winthrop

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.01 cfs @ 14.90 hrs, Volume= 0.000 af
Outflow = 0.01 cfs @ 14.90 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 5R: Reach

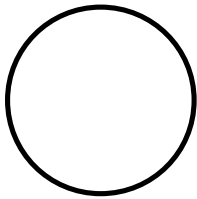
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.603 ac, 1.48% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.21 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 115.0' Slope= 0.0217 '/
Inlet Invert= 279.50', Outlet Invert= 277.00'

**Summary for Reach DP1: Design Point #1 @ Winthrop St.**

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

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.02" for 2-year event
Inflow = 0.03 cfs @ 12.51 hrs, Volume= 0.015 af
Outflow = 0.03 cfs @ 12.51 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream to Hill Street

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

Inflow Area = 18.623 ac, 9.90% Impervious, Inflow Depth = 0.07" for 2-year event
Inflow = 0.48 cfs @ 12.45 hrs, Volume= 0.104 af
Outflow = 0.48 cfs @ 12.45 hrs, Volume= 0.104 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated Wets

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

Inflow Area = 4.870 ac, 0.09% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach WQS: Water Quality Swale

Inflow Area = 0.800 ac, 18.36% Impervious, Inflow Depth = 1.27" for 2-year event
 Inflow = 1.15 cfs @ 12.10 hrs, Volume= 0.085 af
 Outflow = 1.03 cfs @ 12.20 hrs, Volume= 0.085 af, Atten= 10%, Lag= 6.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.38 fps, Min. Travel Time= 3.5 min
 Avg. Velocity = 0.11 fps, Avg. Travel Time= 12.3 min

Peak Storage= 221 cf @ 12.14 hrs
 Average Depth at Peak Storage= 0.41'
 Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 18.34 cfs

6.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight
 Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
 Length= 80.0' Slope= 0.0001 ' '
 Inlet Invert= 262.01', Outlet Invert= 262.00'



Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 0.23" for 2-year event
 Inflow = 1.17 cfs @ 12.20 hrs, Volume= 0.109 af
 Outflow = 0.10 cfs @ 14.90 hrs, Volume= 0.105 af, Atten= 91%, Lag= 162.2 min
 Discarded = 0.09 cfs @ 14.90 hrs, Volume= 0.105 af
 Primary = 0.01 cfs @ 14.90 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 260.00' @ 14.90 hrs Surf.Area= 3,985 sf Storage= 2,230 cf

Plug-Flow detention time= 309.0 min calculated for 0.105 af (97% of inflow)
 Center-of-Mass det. time= 291.2 min (1,168.0 - 876.8)

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Type III 24-hr 2-year Rainfall=3.20"

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Volume	Invert	Avail.Storage	Storage Description									
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
259.00	850	120.0	0			0			850			
261.00	9,400	360.0	8,718			8,718			10,030			
Device	Routing	Invert	Outlet Devices									
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area									
#2	Primary	260.00'	10.0' 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	

Discarded OutFlow Max=0.09 cfs @ 14.90 hrs HW=260.00' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.09 cfs)**Primary OutFlow** Max=0.00 cfs @ 14.90 hrs HW=260.00' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Weir Controls 0.00 cfs @ 0.12 fps)**Summary for Pond 2P: Depression @ Partridge/Winthrop**

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.03" for 2-year event
 Inflow = 0.04 cfs @ 12.49 hrs, Volume= 0.018 af
 Outflow = 0.04 cfs @ 12.51 hrs, Volume= 0.018 af, Atten= 1%, Lag= 1.6 min
 Discarded = 0.00 cfs @ 12.51 hrs, Volume= 0.003 af
 Primary = 0.03 cfs @ 12.51 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 254.29' @ 12.51 hrs Surf.Area= 66 sf Storage= 6 cf

Plug-Flow detention time=4.2 min calculated for 0.018 af (100% of inflow)

Center-of-Mass det. time= 4.2 min (1,012.2 - 1,008.0)

Volume	Invert	Avail.Storage	Storage Description			
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
254.00	0	0.0	0	0	0	
255.50	1,720	170.0	860	860	2,303	
257.00	6,210	300.0	5,599	6,459	7,178	
Device	Routing	Invert	Outlet Devices			
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area			
#2	Primary	254.20'	12.0" Round Culvert			
			L= 10.0' CPP, mitered to conform to fill, Ke= 0.700			
			Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 ' / ' Cc= 0.900			
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf			
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.00 cfs @ 12.51 hrs HW=254.29' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.03 cfs @ 12.51 hrs HW=254.29' (Free Discharge)

↑**2=Culvert** (Inlet Controls 0.03 cfs @ 0.91 fps)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Storage w/in Swamp/PVP

Inflow Area = 11.652 ac, 9.11% Impervious, Inflow Depth = 0.15" for 2-year event
 Inflow = 0.71 cfs @ 12.39 hrs, Volume= 0.147 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.20' @ 24.60 hrs Surf.Area= 36,289 sf Storage= 6,402 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	53,729 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	86,000	1,890.0	53,729	53,729	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.75'	50.0' long x 50.0' 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=0.00 cfs @ 0.00 hrs HW=274.00' (Free Discharge)

↑**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B1: Basin #1

Inflow Area = 3.995 ac, 18.47% Impervious, Inflow Depth = 0.51" for 2-year event
 Inflow = 1.68 cfs @ 12.15 hrs, Volume= 0.170 af
 Outflow = 0.22 cfs @ 13.82 hrs, Volume= 0.170 af, Atten= 87%, Lag= 100.4 min
 Discarded = 0.22 cfs @ 13.82 hrs, Volume= 0.170 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 265.40' @ 13.82 hrs Surf.Area= 4,026 sf Storage= 2,601 cf

Plug-Flow detention time= 119.4 min calculated for 0.170 af (100% of inflow)

Center-of-Mass det. time= 119.2 min (1,007.7 - 888.5)

Volume	Invert	Avail.Storage	Storage Description
#1	264.70'	16,662 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.70	3,448	330.0	0	0	3,448
265.50	4,116	337.0	3,022	3,022	3,905
266.00	4,636	338.6	2,187	5,208	4,095
268.00	6,892	360.9	11,454	16,662	5,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.50'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.00'	2.5' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.3' Crest Height
#4	Primary	267.00'	12.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.22 cfs @ 13.82 hrs HW=265.40' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=264.70' (Free Discharge)

↑**2=Orifice/Grate** (Controls 0.00 cfs)

↑**3=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

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

Summary for Pond B2: Basin #2

Inflow Area = 1.985 ac, 38.31% Impervious, Inflow Depth = 0.93" for 2-year event
 Inflow = 1.62 cfs @ 12.18 hrs, Volume= 0.154 af
 Outflow = 0.42 cfs @ 12.70 hrs, Volume= 0.154 af, Atten= 74%, Lag= 31.1 min
 Discarded = 0.42 cfs @ 12.70 hrs, Volume= 0.154 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.02' @ 12.70 hrs Surf.Area= 2,208 sf Storage= 1,750 cf

Plug-Flow detention time=33.7 min calculated for 0.154 af (100% of inflow)
 Center-of-Mass det. time= 33.7 min (907.8 - 874.1)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	15,793 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	1,260	214.7	0	0	1,260
276.00	3,362	301.0	4,453	4,453	4,839
278.00	5,281	338.7	8,571	13,025	6,862
278.50	5,797	348.1	2,768	15,793	7,404

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Type III 24-hr 2-year Rainfall=3.20"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	274.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	276.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	277.50'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.42 cfs @ 12.70 hrs HW=275.02' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.42 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=274.00' (Free Discharge)↑**2=Orifice/Grate** (Controls 0.00 cfs)↑**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B3: Basin #3**

Inflow Area = 3.019 ac, 34.40% Impervious, Inflow Depth = 0.41" for 2-year event
 Inflow = 0.62 cfs @ 12.39 hrs, Volume= 0.103 af
 Outflow = 0.38 cfs @ 12.71 hrs, Volume= 0.103 af, Atten= 39%, Lag= 19.5 min
 Discarded = 0.38 cfs @ 12.71 hrs, Volume= 0.103 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 277.56' @ 12.71 hrs Surf.Area= 6,819 sf Storage= 406 cf

Plug-Flow detention time=9.3 min calculated for 0.103 af (100% of inflow)
 Center-of-Mass det. time= 9.3 min (940.7 - 931.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	277.50'	21,496 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.50	6,760	328.3	0	0	6,760
278.00	7,259	337.8	3,504	3,504	7,290
280.00	10,853	451.7	17,992	21,496	14,490

Device	Routing	Invert	Outlet Devices
#1	Discarded	277.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	279.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.38 cfs @ 12.71 hrs HW=277.56' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.38 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=277.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond RG1: Rain Garden #1

Inflow Area = 0.928 ac, 0.35% Impervious, Inflow Depth = 1.04" for 2-year event
 Inflow = 0.95 cfs @ 12.14 hrs, Volume= 0.080 af
 Outflow = 0.42 cfs @ 12.47 hrs, Volume= 0.080 af, Atten= 56%, Lag= 19.7 min
 Discarded = 0.14 cfs @ 12.47 hrs, Volume= 0.074 af
 Primary = 0.28 cfs @ 12.47 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.42' @ 12.47 hrs Surf.Area= 2,444 sf Storage= 939 cf

Plug-Flow detention time=53.7 min calculated for 0.080 af (100% of inflow)
 Center-of-Mass det. time= 53.6 min (918.2 - 864.6)

Volume	Invert	Avail.Storage	Storage Description
#1	270.00'	2,541 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.00	1,998	169.0	0	0	1,998
271.00	3,125	206.0	2,541	2,541	3,118

Device	Routing	Invert	Outlet Devices
#1	Device 2	270.40'	2.0" x 2.0" Horiz. Orifice/Grate X 36.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	268.67'	12.0" Round Culvert L= 70.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 268.67' / 267.97' S= 0.0100 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Discarded	270.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.14 cfs @ 12.47 hrs HW=270.42' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.26 cfs @ 12.47 hrs HW=270.42' (Free Discharge)
 ↑ **2=Culvert** (Passes 0.26 cfs of 4.23 cfs potential flow)
 ↑ **1=Orifice/Grate** (Weir Controls 0.26 cfs @ 0.49 fps)

Summary for Pond RG2: Rain Garden #2

Inflow Area = 0.390 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Atten= 2%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.00' @ 23.99 hrs Surf.Area= 779 sf Storage= 0 cf

Plug-Flow detention time=5.0 min calculated for 0.000 af (100% of inflow)
 Center-of-Mass det. time= 5.1 min (1,401.6 - 1,396.6)

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Type III 24-hr 2-year Rainfall=3.20"

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Volume	Invert	Avail.Storage	Storage Description									
#1	275.00'	1,649 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
275.00	779	392.1	0			0			779			
276.70	1,174	398.4	1,649			1,649			1,559			
Device	Routing	Invert	Outlet Devices									
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	276.00'	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	

Discarded OutFlow Max=0.04 cfs @ 23.99 hrs HW=275.00' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond RG3: Rain Gardens #3**

Inflow Area = 0.202 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-year event
 Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af, Atten= 2%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 23.99 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.00' @ 23.99 hrs Surf.Area= 345 sf Storage= 0 cf

Plug-Flow detention time=5.0 min calculated for 0.000 af (100% of inflow)

Center-of-Mass det. time= 5.1 min (1,401.6 - 1,396.6)

Volume	Invert	Avail.Storage	Storage Description									
#1	275.00'	843 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
275.00	345	316.6	0			0			345			
276.70	664	322.9	843			843			976			
Device	Routing	Invert	Outlet Devices									
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	276.00'	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	

Discarded OutFlow Max=0.02 cfs @ 23.99 hrs HW=275.00' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Subcatchment 1S: PDA 1A

Runoff = 2.26 cfs @ 12.09 hrs, Volume= 0.164 af, Depth= 2.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

	Area (sf)	CN	Description
*	6,400	98	Pavement, HSG C
	26,056	74	>75% Grass cover, Good, HSG C
	2,400	70	Woods, Good, HSG C
	34,856	78	Weighted Average
	28,456		81.64% Pervious Area
	6,400		18.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, min. Tc per TR-55

Summary for Subcatchment PDA1:

Runoff = 0.75 cfs @ 12.14 hrs, Volume= 0.070 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

	Area (sf)	CN	Description
	10,712	70	Woods, Good, HSG C
	9,898	49	50-75% Grass cover, Fair, HSG A
	7,602	30	Woods, Good, HSG A
*	621	98	ex. roof
	7,527	79	50-75% Grass cover, Fair, HSG C
	36,360	58	Weighted Average
	35,739		98.29% Pervious Area
	621		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.8	300	Total			

Summary for Subcatchment PDA10: Remaining NW land to Hill st.

Runoff = 2.85 cfs @ 12.23 hrs, Volume= 0.347 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
26,256	43	Woods/grass comb., Fair, HSG A
3,882	76	Woods/grass comb., Fair, HSG C
* 885	98	ex roof
9,905	39	>75% Grass cover, Good, HSG A
21,520	74	>75% Grass cover, Good, HSG C
69,434	30	Woods, Good, HSG A
24,449	70	Woods, Good, HSG C
60,851	77	Woods, Good, HSG D
217,182	55	Weighted Average
216,297		99.59% Pervious Area
885		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment PDA2: Flow to W. St Culvert

Runoff = 0.57 cfs @ 12.16 hrs, Volume= 0.077 af, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
* 7,500	98	ex roof and drive
25,390	39	>75% Grass cover, Good, HSG A
11,331	74	>75% Grass cover, Good, HSG C
21,304	30	Woods, Good, HSG A
4,730	70	Woods, Good, HSG C
70,255	50	Weighted Average
62,755		89.32% Pervious Area
7,500		10.68% Impervious Area

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Type III 24-hr 10-year Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0360	0.19		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
2.1	485	0.0560	3.81		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
6.5	535	Total			

Summary for Subcatchment PDA3: Uncontrolled

Runoff = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
* 192	98	ex roof
28,475	39	>75% Grass cover, Good, HSG A
157,675	30	Woods, Good, HSG A
186,342	31	Weighted Average
186,150		99.90% Pervious Area
192		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.4	160	0.0500	1.12		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
18.7	210	Total			

Summary for Subcatchment PDA3A: All RD

Runoff = 0.01 cfs @ 13.76 hrs, Volume= 0.005 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
17,000	39	>75% Grass cover, Good, HSG A
17,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA3B: All RD

Runoff = 0.00 cfs @ 13.76 hrs, Volume= 0.002 af, Depth= 0.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
8,800	39	>75% Grass cover, Good, HSG A
8,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA4: Remaining Flow to Swamp

Runoff = 4.57 cfs @ 12.17 hrs, Volume= 0.489 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
50,626	39	>75% Grass cover, Good, HSG A
1,238	80	>75% Grass cover, Good, HSG D
105,623	30	Woods, Good, HSG A
148,756	79	Woods, Fair, HSG D
306,243	55	Weighted Average
306,243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		Sheet Flow, Range n= 0.130 P2= 3.20"
4.3	420	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.3	470	Total			

Summary for Subcatchment PDA5:

Runoff = 2.05 cfs @ 12.13 hrs, Volume= 0.164 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

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Type III 24-hr 10-year Rainfall=4.70"

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Area (sf)	CN	Description
4,700	70	Woods, Good, HSG C
35,575	74	>75% Grass cover, Good, HSG C
* 140	98	Ex. Roofs, HSG A
40,415	74	Weighted Average
40,275		99.65% Pervious Area
140		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	110	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
8.7	160	Total			

Summary for Subcatchment PDA6:

Runoff = 4.66 cfs @ 12.13 hrs, Volume= 0.390 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
47,858	74	>75% Grass cover, Good, HSG C
32,000	98	Paved parking, HSG C
44,462	39	>75% Grass cover, Good, HSG A
7,348	30	Woods, Good, HSG A
1,947	70	Woods, Good, HSG C
133,615	66	Weighted Average
101,615		76.05% Pervious Area
32,000		23.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.9	127	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
1.2	475	0.0220	6.73	5.28	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.5	752	Total			

Summary for Subcatchment PDA7:

Runoff = 3.70 cfs @ 12.17 hrs, Volume= 0.326 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
33,130	98	Paved parking, HSG C
26,805	39	>75% Grass cover, Good, HSG A
26,539	74	>75% Grass cover, Good, HSG C
86,474	72	Weighted Average
53,344		61.69% Pervious Area
33,130		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	191	0.0400	3.22		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
1.5	480	0.0100	5.36	4.21	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.011 Concrete pipe, straight & clean
11.8	721	Total			

Summary for Subcatchment PDA8:

Runoff = 2.43 cfs @ 12.29 hrs, Volume= 0.284 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
45,227	98	Paved parking, HSG A
65,958	39	>75% Grass cover, Good, HSG A
20,305	43	Woods/grass comb., Fair, HSG A
131,490	60	Weighted Average
86,263		65.60% Pervious Area
45,227		34.40% Impervious Area

OE2675-POST-WEST-NORTH-7.11.17

Type III 24-hr 10-year Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0120	0.06		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	239	0.0190	2.22		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	80	0.0070	1.70		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.2	47	0.0100	4.54	3.56	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
17.9	416	Total			

Summary for Subcatchment PDA9:

Runoff = 0.02 cfs @ 14.79 hrs, Volume= 0.016 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.70"

Area (sf)	CN	Description
2,689	96	Gravel surface, HSG A
* 1,035	98	ex roof
66,090	35	Brush, Fair, HSG A
69,814	38	Weighted Average
68,779		98.52% Pervious Area
1,035		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
4.5	430	0.0100	1.61		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
12.0	480	Total			

Summary for Reach 1R: Drainage in Winthrop

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 0.58" for 10-year event

Inflow = 2.73 cfs @ 12.53 hrs, Volume= 0.271 af

Outflow = 2.73 cfs @ 12.53 hrs, Volume= 0.271 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 5R: Reach

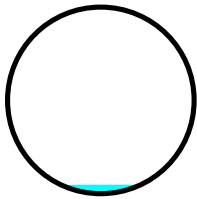
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.603 ac, 1.48% Impervious, Inflow Depth = 0.12" for 10-year event
Inflow = 0.02 cfs @ 14.79 hrs, Volume= 0.016 af
Outflow = 0.02 cfs @ 14.82 hrs, Volume= 0.016 af, Atten= 0%, Lag= 1.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.93 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 1.64 fps, Avg. Travel Time= 1.2 min

Peak Storage= 1 cf @ 14.81 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.21 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 115.0' Slope= 0.0217 '/'
Inlet Invert= 279.50', Outlet Invert= 277.00'

**Summary for Reach DP1: Design Point #1 @ Winthrop St.**

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

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.56" for 10-year event
Inflow = 2.69 cfs @ 12.62 hrs, Volume= 0.337 af
Outflow = 2.69 cfs @ 12.62 hrs, Volume= 0.337 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream to Hill Street

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

Inflow Area = 18.623 ac, 9.90% Impervious, Inflow Depth = 0.22" for 10-year event
Inflow = 2.85 cfs @ 12.23 hrs, Volume= 0.348 af
Outflow = 2.85 cfs @ 12.23 hrs, Volume= 0.348 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated Wets

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

Inflow Area = 4.870 ac, 0.09% Impervious, Inflow Depth = 0.00" for 10-year event
 Inflow = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af
 Outflow = 0.00 cfs @ 24.00 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach WQS: Water Quality Swale

Inflow Area = 0.800 ac, 18.36% Impervious, Inflow Depth = 2.46" for 10-year event
 Inflow = 2.26 cfs @ 12.09 hrs, Volume= 0.164 af
 Outflow = 2.10 cfs @ 12.17 hrs, Volume= 0.164 af, Atten= 7%, Lag= 4.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.47 fps, Min. Travel Time= 2.8 min

Avg. Velocity = 0.13 fps, Avg. Travel Time= 10.3 min

Peak Storage= 354 cf @ 12.12 hrs

Average Depth at Peak Storage= 0.61'

Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 18.34 cfs

6.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 80.0' Slope= 0.0001 ' '

Inlet Invert= 262.01', Outlet Invert= 262.00'



Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 0.87" for 10-year event
 Inflow = 3.00 cfs @ 12.46 hrs, Volume= 0.410 af
 Outflow = 2.85 cfs @ 12.53 hrs, Volume= 0.400 af, Atten= 5%, Lag= 4.5 min
 Discarded = 0.12 cfs @ 12.53 hrs, Volume= 0.129 af
 Primary = 2.73 cfs @ 12.53 hrs, Volume= 0.271 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 260.22' @ 12.53 hrs Surf.Area= 4,990 sf Storage= 3,223 cf

Plug-Flow detention time= 104.6 min calculated for 0.400 af (97% of inflow)

Center-of-Mass det. time= 90.5 min (929.5 - 839.1)

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Type III 24-hr 10-year Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description			
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
259.00	850	120.0	0	0	850	
261.00	9,400	360.0	8,718	8,718	10,030	

Device	Routing	Invert	Outlet Devices									
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area									
#2	Primary	260.00'	10.0' 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	

Discarded OutFlow Max=0.12 cfs @ 12.53 hrs HW=260.22' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.12 cfs)**Primary OutFlow** Max=2.72 cfs @ 12.53 hrs HW=260.22' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir**(Weir Controls 2.72 cfs @ 1.22 fps)**Summary for Pond 2P: Depression @ Partridge/Winthrop**

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.58" for 10-year event
 Inflow = 3.03 cfs @ 12.51 hrs, Volume= 0.348 af
 Outflow = 2.77 cfs @ 12.62 hrs, Volume= 0.348 af, Atten= 9%, Lag= 6.6 min
 Discarded = 0.08 cfs @ 12.62 hrs, Volume= 0.011 af
 Primary = 2.69 cfs @ 12.62 hrs, Volume= 0.337 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 255.35' @ 12.62 hrs Surf.Area= 1,395 sf Storage= 628 cf

Plug-Flow detention time= 2.3 min calculated for 0.348 af (100% of inflow)
 Center-of-Mass det. time= 2.3 min (841.3 - 838.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
254.00	0	0.0	0	0	0	
255.50	1,720	170.0	860	860	2,303	
257.00	6,210	300.0	5,599	6,459	7,178	

Device	Routing	Invert	Outlet Devices									
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	254.20'	12.0" Round Culvert									
			L= 10.0' CPP, mitered to conform to fill, Ke= 0.700									
			Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 '/' Cc= 0.900									
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf									
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.08 cfs @ 12.62 hrs HW=255.35' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=2.69 cfs @ 12.62 hrs HW=255.35' (Free Discharge)

↑ **2=Culvert** (Inlet Controls 2.69 cfs @ 3.42 fps)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 3P: Storage w/in Swamp/PVP

Inflow Area = 11.652 ac, 9.11% Impervious, Inflow Depth = 0.52" for 10-year event
 Inflow = 4.57 cfs @ 12.17 hrs, Volume= 0.505 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 274.55' @ 25.25 hrs Surf.Area= 55,110 sf Storage= 21,976 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	53,729 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	86,000	1,890.0	53,729	53,729	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.75'	50.0' long x 50.0' 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=0.00 cfs @ 0.00 hrs HW=274.00' (Free Discharge)

↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B1: Basin #1

Inflow Area = 3.995 ac, 18.47% Impervious, Inflow Depth = 1.34" for 10-year event
 Inflow = 6.13 cfs @ 12.16 hrs, Volume= 0.448 af
 Outflow = 2.16 cfs @ 12.52 hrs, Volume= 0.448 af, Atten= 65%, Lag= 21.8 min
 Discarded = 0.28 cfs @ 12.52 hrs, Volume= 0.271 af
 Primary = 1.88 cfs @ 12.52 hrs, Volume= 0.176 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 266.33' @ 12.52 hrs Surf.Area= 4,975 sf Storage= 6,784 cf

Plug-Flow detention time= 134.5 min calculated for 0.447 af (100% of inflow)
 Center-of-Mass det. time= 134.4 min (984.1 - 849.7)

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Type III 24-hr 10-year Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	264.70'	16,662 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.70	3,448	330.0	0	0	3,448
265.50	4,116	337.0	3,022	3,022	3,905
266.00	4,636	338.6	2,187	5,208	4,095
268.00	6,892	360.9	11,454	16,662	5,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.50'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.00'	2.5' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.3' Crest Height
#4	Primary	267.00'	12.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.28 cfs @ 12.52 hrs HW=266.33' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.28 cfs)**Primary OutFlow** Max=1.87 cfs @ 12.52 hrs HW=266.33' (Free Discharge)↑ **2=Orifice/Grate** (Orifice Controls 0.34 cfs @ 3.91 fps)↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 1.53 cfs @ 1.92 fps)↑ **4=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B2: Basin #2**

Inflow Area = 1.985 ac, 38.31% Impervious, Inflow Depth = 1.97" for 10-year event
 Inflow = 3.70 cfs @ 12.17 hrs, Volume= 0.326 af
 Outflow = 0.70 cfs @ 12.78 hrs, Volume= 0.326 af, Atten= 81%, Lag= 36.8 min
 Discarded = 0.66 cfs @ 12.78 hrs, Volume= 0.324 af
 Primary = 0.04 cfs @ 12.78 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 276.13' @ 12.78 hrs Surf.Area= 3,471 sf Storage= 4,887 cf

Plug-Flow detention time= 72.5 min calculated for 0.325 af (100% of inflow)
 Center-of-Mass det. time= 72.3 min (923.5 - 851.1)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	15,793 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	1,260	214.7	0	0	1,260
276.00	3,362	301.0	4,453	4,453	4,839
278.00	5,281	338.7	8,571	13,025	6,862
278.50	5,797	348.1	2,768	15,793	7,404

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Type III 24-hr 10-year Rainfall=4.70"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	274.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	276.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	277.50'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.66 cfs @ 12.78 hrs HW=276.13' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.66 cfs)**Primary OutFlow** Max=0.04 cfs @ 12.78 hrs HW=276.13' (Free Discharge)↑**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.21 fps)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B3: Basin #3**

Inflow Area = 3.019 ac, 34.40% Impervious, Inflow Depth = 1.13" for 10-year event
 Inflow = 2.43 cfs @ 12.29 hrs, Volume= 0.284 af
 Outflow = 0.41 cfs @ 13.65 hrs, Volume= 0.284 af, Atten= 83%, Lag= 81.7 min
 Discarded = 0.41 cfs @ 13.65 hrs, Volume= 0.284 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 278.07' @ 13.65 hrs Surf.Area= 7,378 sf Storage= 4,042 cf

Plug-Flow detention time= 95.3 min calculated for 0.284 af (100% of inflow)
 Center-of-Mass det. time= 95.1 min (986.3 - 891.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	277.50'	21,496 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.50	6,760	328.3	0	0	6,760
278.00	7,259	337.8	3,504	3,504	7,290
280.00	10,853	451.7	17,992	21,496	14,490

Device	Routing	Invert	Outlet Devices
#1	Discarded	277.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	279.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.41 cfs @ 13.65 hrs HW=278.07' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.41 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=277.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RG1: Rain Garden #1

Inflow Area = 0.928 ac, 0.35% Impervious, Inflow Depth = 2.13" for 10-year event
 Inflow = 2.05 cfs @ 12.13 hrs, Volume= 0.164 af
 Outflow = 1.73 cfs @ 12.20 hrs, Volume= 0.164 af, Atten= 15%, Lag= 4.3 min
 Discarded = 0.14 cfs @ 12.20 hrs, Volume= 0.107 af
 Primary = 1.59 cfs @ 12.20 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.51' @ 12.20 hrs Surf.Area= 2,540 sf Storage= 1,152 cf

Plug-Flow detention time=43.8 min calculated for 0.164 af (100% of inflow)
 Center-of-Mass det. time= 43.7 min (886.8 - 843.0)

Volume	Invert	Avail.Storage	Storage Description
#1	270.00'	2,541 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.00	1,998	169.0	0	0	1,998
271.00	3,125	206.0	2,541	2,541	3,118

Device	Routing	Invert	Outlet Devices
#1	Device 2	270.40'	2.0" x 2.0" Horiz. Orifice/Grate X 36.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	268.67'	12.0" Round Culvert L= 70.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 268.67' / 267.97' S= 0.0100 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Discarded	270.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.14 cfs @ 12.20 hrs HW=270.51' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=1.59 cfs @ 12.20 hrs HW=270.51' (Free Discharge)
 ↑ **2=Culvert** (Passes 1.59 cfs of 4.38 cfs potential flow)
 ↑ **1=Orifice/Grate** (Orifice Controls 1.59 cfs @ 1.59 fps)

Summary for Pond RG2: Rain Garden #2

Inflow Area = 0.390 ac, 0.00% Impervious, Inflow Depth = 0.14" for 10-year event
 Inflow = 0.01 cfs @ 13.76 hrs, Volume= 0.005 af
 Outflow = 0.01 cfs @ 13.85 hrs, Volume= 0.005 af, Atten= 0%, Lag= 5.1 min
 Discarded = 0.01 cfs @ 13.85 hrs, Volume= 0.005 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.00' @ 13.85 hrs Surf.Area= 780 sf Storage= 2 cf

Plug-Flow detention time=5.1 min calculated for 0.005 af (100% of inflow)
 Center-of-Mass det. time= 5.1 min (1,039.2 - 1,034.2)

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Device	Routing	Invert	Outlet Devices
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	276.00'	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

Discarded OutFlow Max=0.02 cfs @ 13.85 hrs HW=275.00' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Subcatchment 1S: PDA 1A

Runoff = 2.89 cfs @ 12.09 hrs, Volume= 0.209 af, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
*	6,400	98	Pavement, HSG C
	26,056	74	>75% Grass cover, Good, HSG C
	2,400	70	Woods, Good, HSG C
	34,856	78	Weighted Average
	28,456		81.64% Pervious Area
	6,400		18.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, min. Tc per TR-55

Summary for Subcatchment PDA1:

Runoff = 1.17 cfs @ 12.13 hrs, Volume= 0.101 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

	Area (sf)	CN	Description
	10,712	70	Woods, Good, HSG C
	9,898	49	50-75% Grass cover, Fair, HSG A
	7,602	30	Woods, Good, HSG A
*	621	98	ex. roof
	7,527	79	50-75% Grass cover, Fair, HSG C
	36,360	58	Weighted Average
	35,739		98.29% Pervious Area
	621		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.8	300	Total			

Summary for Subcatchment PDA10: Remaining NW land to Hill st.

Runoff = 4.81 cfs @ 12.22 hrs, Volume= 0.515 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
26,256	43	Woods/grass comb., Fair, HSG A
3,882	76	Woods/grass comb., Fair, HSG C
* 885	98	ex roof
9,905	39	>75% Grass cover, Good, HSG A
21,520	74	>75% Grass cover, Good, HSG C
69,434	30	Woods, Good, HSG A
24,449	70	Woods, Good, HSG C
60,851	77	Woods, Good, HSG D
217,182	55	Weighted Average
216,297		99.59% Pervious Area
885		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment PDA2: Flow to W. St Culvert

Runoff = 1.20 cfs @ 12.12 hrs, Volume= 0.122 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
* 7,500	98	ex roof and drive
25,390	39	>75% Grass cover, Good, HSG A
11,331	74	>75% Grass cover, Good, HSG C
21,304	30	Woods, Good, HSG A
4,730	70	Woods, Good, HSG C
70,255	50	Weighted Average
62,755		89.32% Pervious Area
7,500		10.68% Impervious Area

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Type III 24-hr 25-year Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0360	0.19		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
2.1	485	0.0560	3.81		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
6.5	535	Total			

Summary for Subcatchment PDA3: Uncontrolled

Runoff = 0.02 cfs @ 17.04 hrs, Volume= 0.017 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
* 192	98	ex roof
28,475	39	>75% Grass cover, Good, HSG A
157,675	30	Woods, Good, HSG A
186,342	31	Weighted Average
186,150		99.90% Pervious Area
192		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.4	160	0.0500	1.12		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
18.7	210	Total			

Summary for Subcatchment PDA3A: All RD

Runoff = 0.04 cfs @ 12.40 hrs, Volume= 0.010 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
17,000	39	>75% Grass cover, Good, HSG A
17,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA3B: All RD

Runoff = 0.02 cfs @ 12.40 hrs, Volume= 0.005 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
8,800	39	>75% Grass cover, Good, HSG A
8,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA4: Remaining Flow to Swamp

Runoff = 7.64 cfs @ 12.16 hrs, Volume= 0.726 af, Depth= 1.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
50,626	39	>75% Grass cover, Good, HSG A
1,238	80	>75% Grass cover, Good, HSG D
105,623	30	Woods, Good, HSG A
148,756	79	Woods, Fair, HSG D
306,243	55	Weighted Average
306,243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		Sheet Flow, Range n= 0.130 P2= 3.20"
4.3	420	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.3	470	Total			

Summary for Subcatchment PDA5:

Runoff = 2.68 cfs @ 12.13 hrs, Volume= 0.214 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

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Type III 24-hr 25-year Rainfall=5.50"

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Area (sf)	CN	Description
4,700	70	Woods, Good, HSG C
35,575	74	>75% Grass cover, Good, HSG C
* 140	98	Ex. Roofs, HSG A
40,415	74	Weighted Average
40,275		99.65% Pervious Area
140		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	110	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
8.7	160	Total			

Summary for Subcatchment PDA6:

Runoff = 6.50 cfs @ 12.13 hrs, Volume= 0.531 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
47,858	74	>75% Grass cover, Good, HSG C
32,000	98	Paved parking, HSG C
44,462	39	>75% Grass cover, Good, HSG A
7,348	30	Woods, Good, HSG A
1,947	70	Woods, Good, HSG C
133,615	66	Weighted Average
101,615		76.05% Pervious Area
32,000		23.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.9	127	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
1.2	475	0.0220	6.73	5.28	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.5	752	Total			

Summary for Subcatchment PDA7:

Runoff = 4.92 cfs @ 12.17 hrs, Volume= 0.428 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
33,130	98	Paved parking, HSG C
26,805	39	>75% Grass cover, Good, HSG A
26,539	74	>75% Grass cover, Good, HSG C
86,474	72	Weighted Average
53,344		61.69% Pervious Area
33,130		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	191	0.0400	3.22		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
1.5	480	0.0100	5.36	4.21	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.011 Concrete pipe, straight & clean
11.8	721	Total			

Summary for Subcatchment PDA8:

Runoff = 3.66 cfs @ 12.27 hrs, Volume= 0.403 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
45,227	98	Paved parking, HSG A
65,958	39	>75% Grass cover, Good, HSG A
20,305	43	Woods/grass comb., Fair, HSG A
131,490	60	Weighted Average
86,263		65.60% Pervious Area
45,227		34.40% Impervious Area

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Type III 24-hr 25-year Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0120	0.06		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	239	0.0190	2.22		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	80	0.0070	1.70		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.2	47	0.0100	4.54	3.56	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
17.9	416	Total			

Summary for Subcatchment PDA9:

Runoff = 0.10 cfs @ 12.52 hrs, Volume= 0.036 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=5.50"

Area (sf)	CN	Description
2,689	96	Gravel surface, HSG A
* 1,035	98	ex roof
66,090	35	Brush, Fair, HSG A
69,814	38	Weighted Average
68,779		98.52% Pervious Area
1,035		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
4.5	430	0.0100	1.61		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
12.0	480	Total			

Summary for Reach 1R: Drainage in Winthrop

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 1.03" for 25-year event

Inflow = 5.59 cfs @ 12.43 hrs, Volume= 0.482 af

Outflow = 5.59 cfs @ 12.43 hrs, Volume= 0.482 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 5R: Reach

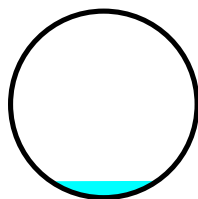
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.603 ac, 1.48% Impervious, Inflow Depth = 0.27" for 25-year event
 Inflow = 0.10 cfs @ 12.52 hrs, Volume= 0.036 af
 Outflow = 0.10 cfs @ 12.54 hrs, Volume= 0.036 af, Atten= 1%, Lag= 1.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Max. Velocity= 2.95 fps, Min. Travel Time= 0.6 min
 Avg. Velocity = 2.06 fps, Avg. Travel Time= 0.9 min

Peak Storage= 4 cf @ 12.53 hrs
 Average Depth at Peak Storage= 0.09'
 Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.21 cfs

12.0" Round Pipe
 n= 0.011 Concrete pipe, straight & clean
 Length= 115.0' Slope= 0.0217 '/
 Inlet Invert= 279.50', Outlet Invert= 277.00'



Summary for Reach DP1: Design Point #1 @ Winthrop St.

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

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.97" for 25-year event
 Inflow = 5.85 cfs @ 12.51 hrs, Volume= 0.584 af
 Outflow = 5.85 cfs @ 12.51 hrs, Volume= 0.584 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream to Hill Street

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

Inflow Area = 18.623 ac, 9.90% Impervious, Inflow Depth = 0.35" for 25-year event
 Inflow = 4.81 cfs @ 12.22 hrs, Volume= 0.545 af
 Outflow = 4.81 cfs @ 12.22 hrs, Volume= 0.545 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated Wets

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

Inflow Area = 4.870 ac, 0.09% Impervious, Inflow Depth = 0.04" for 25-year event
 Inflow = 0.02 cfs @ 17.04 hrs, Volume= 0.017 af
 Outflow = 0.02 cfs @ 17.04 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach WQS: Water Quality Swale

Inflow Area = 0.800 ac, 18.36% Impervious, Inflow Depth = 3.14" for 25-year event
 Inflow = 2.89 cfs @ 12.09 hrs, Volume= 0.209 af
 Outflow = 2.69 cfs @ 12.17 hrs, Volume= 0.209 af, Atten= 7%, Lag= 4.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.52 fps, Min. Travel Time= 2.6 min

Avg. Velocity = 0.14 fps, Avg. Travel Time= 9.6 min

Peak Storage= 420 cf @ 12.12 hrs

Average Depth at Peak Storage= 0.71'

Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 18.34 cfs

6.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 80.0' Slope= 0.0001 ' '

Inlet Invert= 262.01', Outlet Invert= 262.00'

**Summary for Pond 1P: Storage @ Wets**

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 1.35" for 25-year event
 Inflow = 5.94 cfs @ 12.36 hrs, Volume= 0.632 af
 Outflow = 5.72 cfs @ 12.43 hrs, Volume= 0.619 af, Atten= 4%, Lag= 4.3 min
 Discarded = 0.13 cfs @ 12.43 hrs, Volume= 0.138 af
 Primary = 5.59 cfs @ 12.43 hrs, Volume= 0.482 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 260.36' @ 12.43 hrs Surf.Area= 5,654 sf Storage= 3,936 cf

Plug-Flow detention time= 72.7 min calculated for 0.619 af (98% of inflow)

Center-of-Mass det. time= 60.9 min (888.4 - 827.5)

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Volume	Invert	Avail.Storage	Storage Description			
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
259.00	850	120.0	0	0	850	
261.00	9,400	360.0	8,718	8,718	10,030	

Device	Routing	Invert	Outlet Devices									
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area									
#2	Primary	260.00'	10.0' 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	

Discarded OutFlow Max=0.13 cfs @ 12.43 hrs HW=260.36' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.13 cfs)**Primary OutFlow** Max=5.56 cfs @ 12.43 hrs HW=260.36' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Weir Controls 5.56 cfs @ 1.56 fps)**Summary for Pond 2P: Depression @ Partridge/Winthrop**

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 1.00" for 25-year event
 Inflow = 6.24 cfs @ 12.41 hrs, Volume= 0.603 af
 Outflow = 6.03 cfs @ 12.51 hrs, Volume= 0.603 af, Atten= 3%, Lag= 5.7 min
 Discarded = 0.18 cfs @ 12.51 hrs, Volume= 0.020 af
 Primary = 5.85 cfs @ 12.51 hrs, Volume= 0.584 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 256.09' @ 12.51 hrs Surf.Area= 3,144 sf Storage= 2,266 cf

Plug-Flow detention time=4.3 min calculated for 0.602 af (100% of inflow)
 Center-of-Mass det. time= 4.3 min (832.1 - 827.8)

Volume	Invert	Avail.Storage	Storage Description			
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
254.00	0	0.0	0	0	0	
255.50	1,720	170.0	860	860	2,303	
257.00	6,210	300.0	5,599	6,459	7,178	

Device	Routing	Invert	Outlet Devices									
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	254.20'	12.0" Round Culvert									
			L= 10.0' CPP, mitered to conform to fill, Ke= 0.700									
			Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 '/' Cc= 0.900									
			n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf									
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.18 cfs @ 12.51 hrs HW=256.08' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.18 cfs)**Primary OutFlow** Max=5.76 cfs @ 12.51 hrs HW=256.08' (Free Discharge)↑ **2=Culvert** (Inlet Controls 3.93 cfs @ 5.00 fps)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.83 cfs @ 0.72 fps)**Summary for Pond 3P: Storage w/in Swamp/PVP**

Inflow Area = 11.652 ac, 9.11% Impervious, Inflow Depth = 0.78" for 25-year event
 Inflow = 7.64 cfs @ 12.16 hrs, Volume= 0.762 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.73' @ 25.35 hrs Surf.Area= 66,832 sf Storage= 33,196 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	53,729 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	86,000	1,890.0	53,729	53,729	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.75'	50.0' long x 50.0' 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=0.00 cfs @ 0.00 hrs HW=274.00' (Free Discharge)↑ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B1: Basin #1**

Inflow Area = 3.995 ac, 18.47% Impervious, Inflow Depth = 1.87" for 25-year event
 Inflow = 8.38 cfs @ 12.14 hrs, Volume= 0.623 af
 Outflow = 4.35 cfs @ 12.41 hrs, Volume= 0.623 af, Atten= 48%, Lag= 16.3 min
 Discarded = 0.29 cfs @ 12.41 hrs, Volume= 0.302 af
 Primary = 4.06 cfs @ 12.41 hrs, Volume= 0.322 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 266.58' @ 12.41 hrs Surf.Area= 5,247 sf Storage= 8,087 cf

Plug-Flow detention time= 113.9 min calculated for 0.623 af (100% of inflow)

Center-of-Mass det. time= 113.7 min (953.6 - 839.9)

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Volume	Invert	Avail.Storage	Storage Description		
#1	264.70'	16,662 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.70	3,448	330.0	0	0	3,448
265.50	4,116	337.0	3,022	3,022	3,905
266.00	4,636	338.6	2,187	5,208	4,095
268.00	6,892	360.9	11,454	16,662	5,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.50'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.00'	2.5' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.3' Crest Height
#4	Primary	267.00'	12.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.29 cfs @ 12.41 hrs HW=266.58' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.29 cfs)**Primary OutFlow** Max=4.04 cfs @ 12.41 hrs HW=266.58' (Free Discharge)↑ **2=Orifice/Grate** (Orifice Controls 0.40 cfs @ 4.60 fps)↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 3.64 cfs @ 2.63 fps)↑ **4=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B2: Basin #2**

Inflow Area = 1.985 ac, 38.31% Impervious, Inflow Depth = 2.59" for 25-year event
 Inflow = 4.92 cfs @ 12.17 hrs, Volume= 0.428 af
 Outflow = 1.02 cfs @ 12.72 hrs, Volume= 0.428 af, Atten= 79%, Lag= 32.8 min
 Discarded = 0.74 cfs @ 12.72 hrs, Volume= 0.398 af
 Primary = 0.27 cfs @ 12.72 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 276.59' @ 12.72 hrs Surf.Area= 3,888 sf Storage= 6,608 cf

Plug-Flow detention time= 78.9 min calculated for 0.428 af (100% of inflow)
 Center-of-Mass det. time= 78.8 min (921.9 - 843.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	274.00'	15,793 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	1,260	214.7	0	0	1,260
276.00	3,362	301.0	4,453	4,453	4,839
278.00	5,281	338.7	8,571	13,025	6,862
278.50	5,797	348.1	2,768	15,793	7,404

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Type III 24-hr 25-year Rainfall=5.50"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	274.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	276.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	277.50'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.74 cfs @ 12.72 hrs HW=276.59' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.74 cfs)**Primary OutFlow** Max=0.27 cfs @ 12.72 hrs HW=276.59' (Free Discharge)↑**2=Orifice/Grate** (Orifice Controls 0.27 cfs @ 3.15 fps)↑**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B3: Basin #3**

Inflow Area = 3.019 ac, 34.40% Impervious, Inflow Depth = 1.60" for 25-year event

Inflow = 3.66 cfs @ 12.27 hrs, Volume= 0.403 af

Outflow = 0.45 cfs @ 14.26 hrs, Volume= 0.403 af, Atten= 88%, Lag= 119.3 min

Discarded = 0.45 cfs @ 14.26 hrs, Volume= 0.403 af

Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 278.46' @ 14.26 hrs Surf.Area= 8,030 sf Storage= 7,055 cf

Plug-Flow detention time= 168.9 min calculated for 0.403 af (100% of inflow)

Center-of-Mass det. time= 168.8 min (1,048.4 - 879.6)

Volume	Invert	Avail.Storage	Storage Description
#1	277.50'	21,496 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.50	6,760	328.3	0	0	6,760
278.00	7,259	337.8	3,504	3,504	7,290
280.00	10,853	451.7	17,992	21,496	14,490

Device	Routing	Invert	Outlet Devices
#1	Discarded	277.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	279.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.45 cfs @ 14.26 hrs HW=278.46' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.45 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=277.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond RG1: Rain Garden #1

Inflow Area = 0.928 ac, 0.35% Impervious, Inflow Depth = 2.77" for 25-year event
 Inflow = 2.68 cfs @ 12.13 hrs, Volume= 0.214 af
 Outflow = 2.20 cfs @ 12.21 hrs, Volume= 0.214 af, Atten= 18%, Lag= 4.7 min
 Discarded = 0.15 cfs @ 12.21 hrs, Volume= 0.121 af
 Primary = 2.05 cfs @ 12.21 hrs, Volume= 0.093 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.58' @ 12.21 hrs Surf.Area= 2,623 sf Storage= 1,341 cf

Plug-Flow detention time= 39.6 min calculated for 0.214 af (100% of inflow)
 Center-of-Mass det. time= 39.5 min (874.9 - 835.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	270.00'	2,541 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.00	1,998	169.0	0	0	1,998
271.00	3,125	206.0	2,541	2,541	3,118

Device	Routing	Invert	Outlet Devices
#1	Device 2	270.40'	2.0" x 2.0" Horiz. Orifice/Grate X 36.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	268.67'	12.0" Round Culvert L= 70.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 268.67' / 267.97' S= 0.0100 ' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Discarded	270.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.15 cfs @ 12.21 hrs HW=270.58' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=2.05 cfs @ 12.21 hrs HW=270.58' (Free Discharge)
 ↑ **2=Culvert** (Passes 2.05 cfs of 4.49 cfs potential flow)
 ↑ **1=Orifice/Grate** (Orifice Controls 2.05 cfs @ 2.05 fps)

Summary for Pond RG2: Rain Garden #2

Inflow Area = 0.390 ac, 0.00% Impervious, Inflow Depth = 0.31" for 25-year event
 Inflow = 0.04 cfs @ 12.40 hrs, Volume= 0.010 af
 Outflow = 0.03 cfs @ 12.48 hrs, Volume= 0.010 af, Atten= 9%, Lag= 5.0 min
 Discarded = 0.03 cfs @ 12.48 hrs, Volume= 0.010 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.01' @ 12.48 hrs Surf.Area= 782 sf Storage= 11 cf

Plug-Flow detention time= 5.1 min calculated for 0.010 af (100% of inflow)
 Center-of-Mass det. time= 5.1 min (985.9 - 980.8)

Volume	Invert	Avail.Storage	Storage Description									
#1	275.00'	1,649 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
275.00	779	392.1	0			0			779			
276.70	1,174	398.4	1,649			1,649			1,559			
Device	Routing	Invert	Outlet Devices									
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	276.00'	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	

Discarded OutFlow Max=0.04 cfs @ 12.48 hrs HW=275.01' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond RG3: Rain Gardens #3

Inflow Area = 0.202 ac, 0.00% Impervious, Inflow Depth = 0.31" for 25-year event
 Inflow = 0.02 cfs @ 12.40 hrs, Volume= 0.005 af
 Outflow = 0.02 cfs @ 12.48 hrs, Volume= 0.005 af, Atten= 9%, Lag= 5.0 min
 Discarded = 0.02 cfs @ 12.48 hrs, Volume= 0.005 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.02' @ 12.48 hrs Surf.Area= 347 sf Storage= 5 cf

Plug-Flow detention time=5.1 min calculated for 0.005 af (100% of inflow)
 Center-of-Mass det. time= 5.1 min (985.9 - 980.8)

Volume	Invert	Avail.Storage	Storage Description									
#1	275.00'	843 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
275.00	345	316.6	0			0			345			
276.70	664	322.9	843			843			976			
Device	Routing	Invert	Outlet Devices									
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	276.00'	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	

Discarded OutFlow Max=0.02 cfs @ 12.48 hrs HW=275.02' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Subcatchment 1S: PDA 1A

Runoff = 3.85 cfs @ 12.09 hrs, Volume= 0.280 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

	Area (sf)	CN	Description
*	6,400	98	Pavement, HSG C
	26,056	74	>75% Grass cover, Good, HSG C
	2,400	70	Woods, Good, HSG C
	34,856	78	Weighted Average
	28,456		81.64% Pervious Area
	6,400		18.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, min. Tc per TR-55

Summary for Subcatchment PDA1:

Runoff = 1.90 cfs @ 12.12 hrs, Volume= 0.154 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

	Area (sf)	CN	Description
	10,712	70	Woods, Good, HSG C
	9,898	49	50-75% Grass cover, Fair, HSG A
	7,602	30	Woods, Good, HSG A
*	621	98	ex. roof
	7,527	79	50-75% Grass cover, Fair, HSG C
	36,360	58	Weighted Average
	35,739		98.29% Pervious Area
	621		1.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.5	50	0.1000	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.20"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
7.8	300	Total			

Summary for Subcatchment PDA10: Remaining NW land to Hill st.

Runoff = 8.15 cfs @ 12.21 hrs, Volume= 0.804 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
26,256	43	Woods/grass comb., Fair, HSG A
3,882	76	Woods/grass comb., Fair, HSG C
* 885	98	ex roof
9,905	39	>75% Grass cover, Good, HSG A
21,520	74	>75% Grass cover, Good, HSG C
69,434	30	Woods, Good, HSG A
24,449	70	Woods, Good, HSG C
60,851	77	Woods, Good, HSG D
217,182	55	Weighted Average
216,297		99.59% Pervious Area
885		0.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	50	0.0300	0.08		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.8	400	0.0220	2.39		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
13.3	450	Total			

Summary for Subcatchment PDA2: Flow to W. St Culvert

Runoff = 2.34 cfs @ 12.11 hrs, Volume= 0.202 af, Depth= 1.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
* 7,500	98	ex roof and drive
25,390	39	>75% Grass cover, Good, HSG A
11,331	74	>75% Grass cover, Good, HSG C
21,304	30	Woods, Good, HSG A
4,730	70	Woods, Good, HSG C
70,255	50	Weighted Average
62,755		89.32% Pervious Area
7,500		10.68% Impervious Area

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Type III 24-hr 100-year Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	50	0.0360	0.19		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
2.1	485	0.0560	3.81		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
6.5	535	Total			

Summary for Subcatchment PDA3: Uncontrolled

Runoff = 0.12 cfs @ 13.96 hrs, Volume= 0.074 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
* 192	98	ex roof
28,475	39	>75% Grass cover, Good, HSG A
157,675	30	Woods, Good, HSG A
186,342	31	Weighted Average
186,150		99.90% Pervious Area
192		0.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	50	0.0100	0.05		Sheet Flow,
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.4	160	0.0500	1.12		Shallow Concentrated Flow,
					Woodland Kv= 5.0 fps
18.7	210	Total			

Summary for Subcatchment PDA3A: All RD

Runoff = 0.12 cfs @ 12.26 hrs, Volume= 0.022 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
17,000	39	>75% Grass cover, Good, HSG A
17,000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA3B: All RD

Runoff = 0.06 cfs @ 12.26 hrs, Volume= 0.011 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
8,800	39	>75% Grass cover, Good, HSG A
8,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 MIN

Summary for Subcatchment PDA4: Remaining Flow to Swamp

Runoff = 12.93 cfs @ 12.15 hrs, Volume= 1.134 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
50,626	39	>75% Grass cover, Good, HSG A
1,238	80	>75% Grass cover, Good, HSG D
105,623	30	Woods, Good, HSG A
148,756	79	Woods, Fair, HSG D
306,243	55	Weighted Average
306,243		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0	50	0.0200	0.17		Sheet Flow, Range n= 0.130 P2= 3.20"
4.3	420	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
9.3	470	Total			

Summary for Subcatchment PDA5:

Runoff = 3.70 cfs @ 12.12 hrs, Volume= 0.292 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

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Type III 24-hr 100-year Rainfall=6.70"

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Area (sf)	CN	Description
4,700	70	Woods, Good, HSG C
35,575	74	>75% Grass cover, Good, HSG C
* 140	98	Ex. Roofs, HSG A
40,415	74	Weighted Average
40,275		99.65% Pervious Area
140		0.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0600	0.10		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
0.8	110	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
8.7	160	Total			

Summary for Subcatchment PDA6:

Runoff = 9.48 cfs @ 12.13 hrs, Volume= 0.759 af, Depth= 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
47,858	74	>75% Grass cover, Good, HSG C
32,000	98	Paved parking, HSG C
44,462	39	>75% Grass cover, Good, HSG A
7,348	30	Woods, Good, HSG A
1,947	70	Woods, Good, HSG C
133,615	66	Weighted Average
101,615		76.05% Pervious Area
32,000		23.95% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.9	127	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	100	0.0100	2.03		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
1.2	475	0.0220	6.73	5.28	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.5	752	Total			

Summary for Subcatchment PDA7:

Runoff = 6.83 cfs @ 12.17 hrs, Volume= 0.591 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
33,130	98	Paved parking, HSG C
26,805	39	>75% Grass cover, Good, HSG A
26,539	74	>75% Grass cover, Good, HSG C
86,474	72	Weighted Average
53,344		61.69% Pervious Area
33,130		38.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	50	0.0400	0.09		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
1.0	191	0.0400	3.22		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
1.5	480	0.0100	5.36	4.21	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.011 Concrete pipe, straight & clean
11.8	721	Total			

Summary for Subcatchment PDA8:

Runoff = 5.71 cfs @ 12.26 hrs, Volume= 0.602 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
45,227	98	Paved parking, HSG A
65,958	39	>75% Grass cover, Good, HSG A
20,305	43	Woods/grass comb., Fair, HSG A
131,490	60	Weighted Average
86,263		65.60% Pervious Area
45,227		34.40% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	50	0.0120	0.06		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
1.8	239	0.0190	2.22		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
0.8	80	0.0070	1.70		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.2	47	0.0100	4.54	3.56	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
17.9	416	Total			

Summary for Subcatchment PDA9:

Runoff = 0.41 cfs @ 12.40 hrs, Volume= 0.080 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=6.70"

Area (sf)	CN	Description
2,689	96	Gravel surface, HSG A
1,035	98	ex roof
66,090	35	Brush, Fair, HSG A
69,814	38	Weighted Average
68,779		98.52% Pervious Area
1,035		1.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, AB Woods: Light underbrush n= 0.400 P2= 3.20"
4.5	430	0.0100	1.61		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
12.0	480	Total			

Summary for Reach 1R: Drainage in Winthrop

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 1.80" for 100-year event
Inflow = 10.41 cfs @ 12.32 hrs, Volume= 0.843 af
Outflow = 10.41 cfs @ 12.32 hrs, Volume= 0.843 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach 5R: Reach

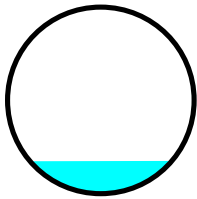
[52] Hint: Inlet/Outlet conditions not evaluated

Inflow Area = 1.603 ac, 1.48% Impervious, Inflow Depth = 0.60" for 100-year event
Inflow = 0.41 cfs @ 12.40 hrs, Volume= 0.080 af
Outflow = 0.41 cfs @ 12.41 hrs, Volume= 0.080 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.47 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 2.54 fps, Avg. Travel Time= 0.8 min

Peak Storage= 11 cf @ 12.40 hrs
Average Depth at Peak Storage= 0.17'
Bank-Full Depth= 1.00' Flow Area= 0.8 sf, Capacity= 6.21 cfs

12.0" Round Pipe
n= 0.011 Concrete pipe, straight & clean
Length= 115.0' Slope= 0.0217 '/'
Inlet Invert= 279.50', Outlet Invert= 277.00'

**Summary for Reach DP1: Design Point #1 @ Winthrop St.**

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

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 1.68" for 100-year event
Inflow = 11.50 cfs @ 12.33 hrs, Volume= 1.017 af
Outflow = 11.50 cfs @ 12.33 hrs, Volume= 1.017 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP2: Stream to Hill Street

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

Inflow Area = 18.623 ac, 9.90% Impervious, Inflow Depth > 0.86" for 100-year event
Inflow = 8.34 cfs @ 12.21 hrs, Volume= 1.332 af
Outflow = 8.34 cfs @ 12.21 hrs, Volume= 1.332 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach DP5: Isolated Wets

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

Inflow Area = 4.870 ac, 0.09% Impervious, Inflow Depth = 0.18" for 100-year event
 Inflow = 0.12 cfs @ 13.96 hrs, Volume= 0.074 af
 Outflow = 0.12 cfs @ 13.96 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Reach WQS: Water Quality Swale

Inflow Area = 0.800 ac, 18.36% Impervious, Inflow Depth = 4.20" for 100-year event
 Inflow = 3.85 cfs @ 12.09 hrs, Volume= 0.280 af
 Outflow = 3.59 cfs @ 12.16 hrs, Volume= 0.280 af, Atten= 7%, Lag= 4.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.57 fps, Min. Travel Time= 2.3 min

Avg. Velocity = 0.15 fps, Avg. Travel Time= 8.9 min

Peak Storage= 513 cf @ 12.12 hrs

Average Depth at Peak Storage= 0.84'

Bank-Full Depth= 2.00' Flow Area= 20.0 sf, Capacity= 18.34 cfs

6.00' x 2.00' deep channel, n= 0.022 Earth, clean & straight

Side Slope Z-value= 2.0 ' ' Top Width= 14.00'

Length= 80.0' Slope= 0.0001 ' '

Inlet Invert= 262.01', Outlet Invert= 262.00'



Summary for Pond 1P: Storage @ Wets

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 2.15" for 100-year event
 Inflow = 11.09 cfs @ 12.23 hrs, Volume= 1.006 af
 Outflow = 10.56 cfs @ 12.32 hrs, Volume= 0.990 af, Atten= 5%, Lag= 5.3 min
 Discarded = 0.16 cfs @ 12.32 hrs, Volume= 0.147 af
 Primary = 10.41 cfs @ 12.32 hrs, Volume= 0.843 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 260.53' @ 12.32 hrs Surf.Area= 6,581 sf Storage= 5,006 cf

Plug-Flow detention time= 49.4 min calculated for 0.990 af (98% of inflow)

Center-of-Mass det. time= 40.3 min (859.4 - 819.2)

Volume	Invert	Avail.Storage	Storage Description									
#1	259.00'	8,718 cf	Custom Stage Data (Irregular) Listed below (Recalc)									
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)			Cum.Store (cubic-feet)			Wet.Area (sq-ft)			
259.00	850	120.0	0			0			850			
261.00	9,400	360.0	8,718			8,718			10,030			
Device	Routing	Invert	Outlet Devices									
#1	Discarded	259.00'	1.020 in/hr Exfiltration over Surface area									
#2	Primary	260.00'	10.0' 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	

Discarded OutFlow Max=0.16 cfs @ 12.32 hrs HW=260.53' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=10.33 cfs @ 12.32 hrs HW=260.53' (Free Discharge)

2=Broad-Crested Rectangular Weir(Weir Controls 10.33 cfs @ 1.95 fps)

Summary for Pond 2P: Depression @ Partridge/Winthrop

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 1.73" for 100-year event
 Inflow = 11.75 cfs @ 12.31 hrs, Volume= 1.045 af
 Outflow = 11.69 cfs @ 12.33 hrs, Volume= 1.045 af, Atten= 0%, Lag= 1.2 min
 Discarded = 0.20 cfs @ 12.33 hrs, Volume= 0.028 af
 Primary = 11.50 cfs @ 12.33 hrs, Volume= 1.017 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 256.21' @ 12.33 hrs Surf.Area= 3,508 sf Storage= 2.687 cfs

Plug-Flow detention time=4.0 min calculated for 1.043 af (100% of inflow)
Center-of-Mass det. time= 4.0 min (826.3 - 822.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	254.00'	6,459 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
254.00	0	0.0	0	0	0
255.50	1,720	170.0	860	860	2,303
257.00	6,210	300.0	5,599	6,459	7,178

Device	Routing	Invert	Outlet Devices
#1	Discarded	254.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	254.20'	12.0" Round Culvert L= 10.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 254.20' / 254.00' S= 0.0200 ' / ' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Primary	256.00'	30.0' 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

Discarded OutFlow Max=0.20 cfs @ 12.33 hrs HW=256.21' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.20 cfs)**Primary OutFlow** Max=11.43 cfs @ 12.33 hrs HW=256.21' (Free Discharge)↑ **2=Culvert** (Inlet Controls 4.10 cfs @ 5.22 fps)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 7.33 cfs @ 1.15 fps)**Summary for Pond 3P: Storage w/in Swamp/PVP**

Inflow Area = 11.652 ac, 9.11% Impervious, Inflow Depth = 1.27" for 100-year event
 Inflow = 13.05 cfs @ 12.15 hrs, Volume= 1.233 af
 Outflow = 0.91 cfs @ 15.74 hrs, Volume= 0.441 af, Atten= 93%, Lag= 215.5 min
 Primary = 0.91 cfs @ 15.74 hrs, Volume= 0.441 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.79' @ 15.74 hrs Surf.Area= 70,558 sf Storage= 36,982 cf

Plug-Flow detention time=410.1 min calculated for 0.440 af (36% of inflow)

Center-of-Mass det. time= 263.8 min (1,141.0 - 877.2)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	53,729 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	86,000	1,890.0	53,729	53,729	214,976

Device	Routing	Invert	Outlet Devices
#1	Primary	274.75'	50.0' long x 50.0' 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=0.90 cfs @ 15.74 hrs HW=274.79' (Free Discharge)↑ **1=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 0.51 fps)**Summary for Pond B1: Basin #1**

Inflow Area = 3.995 ac, 18.47% Impervious, Inflow Depth = 2.74" for 100-year event
 Inflow = 11.89 cfs @ 12.14 hrs, Volume= 0.911 af
 Outflow = 7.84 cfs @ 12.31 hrs, Volume= 0.911 af, Atten= 34%, Lag= 10.7 min
 Discarded = 0.31 cfs @ 12.31 hrs, Volume= 0.339 af
 Primary = 7.53 cfs @ 12.31 hrs, Volume= 0.573 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 266.90' @ 12.31 hrs Surf.Area= 5,599 sf Storage= 9,822 cf

Plug-Flow detention time=92.2 min calculated for 0.910 af (100% of inflow)

Center-of-Mass det. time= 92.4 min (922.3 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	264.70'	16,662 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.70	3,448	330.0	0	0	3,448
265.50	4,116	337.0	3,022	3,022	3,905
266.00	4,636	338.6	2,187	5,208	4,095
268.00	6,892	360.9	11,454	16,662	5,520

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.50'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.00'	2.5' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.3' Crest Height
#4	Primary	267.00'	12.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.31 cfs @ 12.31 hrs HW=266.90' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=7.49 cfs @ 12.31 hrs HW=266.90' (Free Discharge)

↑**2=Orifice/Grate** (Orifice Controls 0.47 cfs @ 5.35 fps)

↑**3=Sharp-Crested Rectangular Weir**(Weir Controls 7.02 cfs @ 3.36 fps)

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

Summary for Pond B2: Basin #2

Inflow Area = 1.985 ac, 38.31% Impervious, Inflow Depth = 3.57" for 100-year event
Inflow = 6.83 cfs @ 12.17 hrs, Volume= 0.591 af
Outflow = 1.32 cfs @ 12.73 hrs, Volume= 0.591 af, Atten= 81%, Lag= 33.5 min
Discarded = 0.87 cfs @ 12.73 hrs, Volume= 0.505 af
Primary = 0.45 cfs @ 12.73 hrs, Volume= 0.086 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 277.31' @ 12.73 hrs Surf.Area= 4,566 sf Storage= 9,610 cf

Plug-Flow detention time=88.1 min calculated for 0.590 af (100% of inflow)
Center-of-Mass det. time= 88.0 min (921.8 - 833.8)

Volume	Invert	Avail.Storage	Storage Description
#1	274.00'	15,793 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	1,260	214.7	0	0	1,260
276.00	3,362	301.0	4,453	4,453	4,839
278.00	5,281	338.7	8,571	13,025	6,862
278.50	5,797	348.1	2,768	15,793	7,404

OE2675-POST-WEST-NORTH-7.11.17

Type III 24-hr 100-year Rainfall=6.70"

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Device	Routing	Invert	Outlet Devices
#1	Discarded	274.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	276.00'	4.0" Vert. Orifice/Grate C= 0.600
#3	Primary	277.50'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.87 cfs @ 12.73 hrs HW=277.31' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.87 cfs)**Primary OutFlow** Max=0.45 cfs @ 12.73 hrs HW=277.31' (Free Discharge)↑**2=Orifice/Grate** (Orifice Controls 0.45 cfs @ 5.14 fps)↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B3: Basin #3**

Inflow Area = 3.019 ac, 34.40% Impervious, Inflow Depth = 2.39" for 100-year event
 Inflow = 5.71 cfs @ 12.26 hrs, Volume= 0.602 af
 Outflow = 0.69 cfs @ 14.02 hrs, Volume= 0.602 af, Atten= 88%, Lag= 105.6 min
 Discarded = 0.50 cfs @ 14.02 hrs, Volume= 0.583 af
 Primary = 0.18 cfs @ 14.02 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 279.04' @ 14.02 hrs Surf.Area= 9,035 sf Storage= 11,945 cf

Plug-Flow detention time= 259.7 min calculated for 0.601 af (100% of inflow)

Center-of-Mass det. time= 259.6 min (1,126.7 - 867.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	277.50'	21,496 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
277.50	6,760	328.3	0	0	6,760
278.00	7,259	337.8	3,504	3,504	7,290
280.00	10,853	451.7	17,992	21,496	14,490

Device	Routing	Invert	Outlet Devices
#1	Discarded	277.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	279.00'	10.0' long x 5.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.50 cfs @ 14.02 hrs HW=279.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.50 cfs)**Primary OutFlow** Max=0.17 cfs @ 14.02 hrs HW=279.04' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Weir Controls 0.17 cfs @ 0.46 fps)

Summary for Pond RG1: Rain Garden #1

Inflow Area = 0.928 ac, 0.35% Impervious, Inflow Depth = 3.78" for 100-year event
 Inflow = 3.70 cfs @ 12.12 hrs, Volume= 0.292 af
 Outflow = 2.84 cfs @ 12.22 hrs, Volume= 0.292 af, Atten= 23%, Lag= 5.5 min
 Discarded = 0.15 cfs @ 12.22 hrs, Volume= 0.141 af
 Primary = 2.69 cfs @ 12.22 hrs, Volume= 0.152 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.71' @ 12.22 hrs Surf.Area= 2,774 sf Storage= 1,691 cf

Plug-Flow detention time= 35.8 min calculated for 0.292 af (100% of inflow)
 Center-of-Mass det. time= 35.7 min (862.1 - 826.4)

Volume	Invert	Avail.Storage	Storage Description
#1	270.00'	2,541 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.00	1,998	169.0	0	0	1,998
271.00	3,125	206.0	2,541	2,541	3,118

Device	Routing	Invert	Outlet Devices
#1	Device 2	270.40'	2.0" x 2.0" Horiz. Orifice/Grate X 36.00 C= 0.600 Limited to weir flow at low heads
#2	Primary	268.67'	12.0" Round Culvert L= 70.3' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 268.67' / 267.97' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Discarded	270.00'	2.410 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.15 cfs @ 12.22 hrs HW=270.71' (Free Discharge)
 ↑ **3=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=2.67 cfs @ 12.22 hrs HW=270.71' (Free Discharge)
 ↑ **2=Culvert** (Passes 2.67 cfs of 4.69 cfs potential flow)
 ↑ **1=Orifice/Grate** (Orifice Controls 2.67 cfs @ 2.67 fps)

Summary for Pond RG2: Rain Garden #2

Inflow Area = 0.390 ac, 0.00% Impervious, Inflow Depth = 0.66" for 100-year event
 Inflow = 0.12 cfs @ 12.26 hrs, Volume= 0.022 af
 Outflow = 0.05 cfs @ 12.94 hrs, Volume= 0.022 af, Atten= 63%, Lag= 40.7 min
 Discarded = 0.05 cfs @ 12.94 hrs, Volume= 0.022 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 275.16' @ 12.94 hrs Surf.Area= 813 sf Storage= 128 cf

Plug-Flow detention time= 20.5 min calculated for 0.022 af (100% of inflow)
 Center-of-Mass det. time= 20.5 min (958.5 - 938.0)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	1,649 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	779	392.1	0	0	779
276.70	1.174	398.4	1.649	1.649	1.559

Device	Routing	Invert	Outlet Devices
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	276.00'	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

Discarded OutFlow Max=0.05 cfs @ 12.94 hrs HW=275.16' (Free Discharge)

1=Exfiltration (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)

2=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Summary for Pond RG3: Rain Gardens #3

Inflow Area =	0.202 ac,	0.00% Impervious,	Inflow Depth = 0.66"	for 100-year event
Inflow =	0.06 cfs @	12.26 hrs,	Volume=	0.011 af
Outflow =	0.02 cfs @	13.07 hrs,	Volume=	0.011 af, Atten= 67%, Lag= 48.6 min
Discarded =	0.02 cfs @	13.07 hrs,	Volume=	0.011 af
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 275.21' @ 13.07 hrs Surf.Area= 378 sf Storage= 75 cf

Plug-Flow detention time= 28.6 min calculated for 0.011 af (100% of inflow)
Center-of-Mass det. time= 28.6 min (966.6 - 938.0)

Volume	Invert	Avail.Storage	Storage Description
#1	275.00'	843 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
275.00	345	316.6	0	0	345
276.70	664	322.9	843	843	976

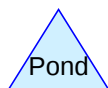
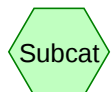
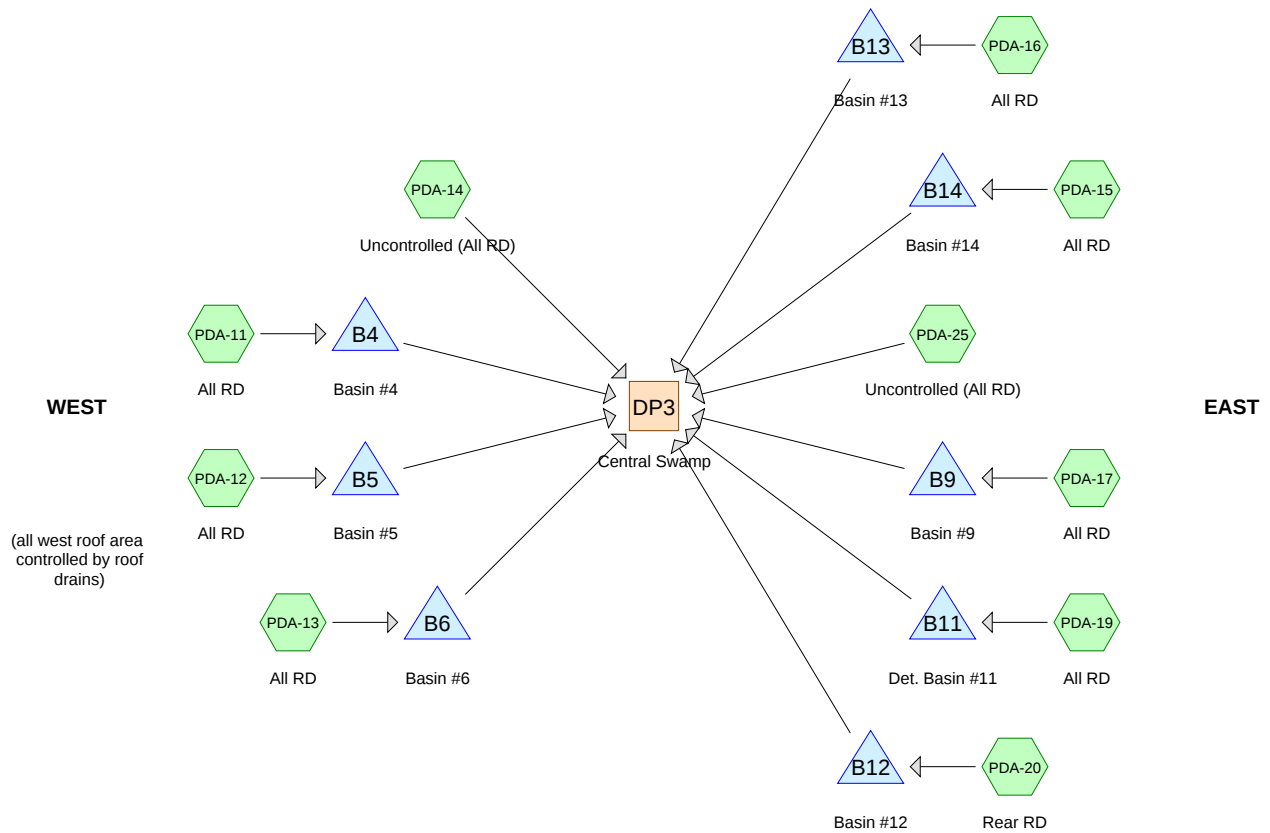
Device	Routing	Invert	Outlet Devices
#1	Discarded	275.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	276.00'	5.0' long x 10.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.02 cfs @ 13.07 hrs HW=275.21' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=275.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.898	51	1 acre lots, 20% imp, HSG A (PDA-25)
0.206	84	1 acre lots, 20% imp, HSG D (PDA-25)
8.601	39	>75% Grass cover, Good, HSG A (PDA-11, PDA-12, PDA-13, PDA-14, PDA-15, PDA-17, PDA-19, PDA-25)
2.207	74	>75% Grass cover, Good, HSG C (PDA-14, PDA-15, PDA-16, PDA-20, PDA-25)
1.245	80	>75% Grass cover, Good, HSG D (PDA-13, PDA-16, PDA-19, PDA-25)
0.156	98	Lots 82 and 83 long drive (PDA-25)
2.182	98	Paved parking, HSG A (PDA-11, PDA-12, PDA-13, PDA-14)
0.149	98	Unconnected roofs, HSG A (PDA-20)
7.469	30	Woods, Good, HSG A (PDA-11, PDA-12, PDA-13, PDA-14, PDA-25)
0.746	70	Woods, Good, HSG C (PDA-14, PDA-25)
2.763	77	Woods, Good, HSG D (PDA-14, PDA-25)
0.019	98	ex Roofs, HSG A (PDA-25)
0.041	98	ex drive (PDA-25)
0.060	98	ex roof (PDA-14)
0.044	98	ex. drive (PDA-14)
2.118	98	roads,sidewalks, drives (PDA-15, PDA-16, PDA-17, PDA-19, PDA-20)
0.713	30	wetland HSG A (PDA-25)
2.564	60	wetland, HSG D (PDA-25)
33.180	56	TOTAL AREA

Summary for Subcatchment PDA-11: All RD

Runoff = 0.09 cfs @ 12.57 hrs, Volume= 0.034 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
29,960	98	Paved parking, HSG A
49,743	39	>75% Grass cover, Good, HSG A
37,306	30	Woods, Good, HSG A
117,009	51	Weighted Average
87,049		74.40% Pervious Area
29,960		25.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.0	198	0.0100	1.61		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
14.3	248	Total			

Summary for Subcatchment PDA-12: All RD

Runoff = 0.57 cfs @ 12.16 hrs, Volume= 0.061 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
23,725	98	Paved parking, HSG A
33,222	39	>75% Grass cover, Good, HSG A
116	30	Woods, Good, HSG A
57,063	64	Weighted Average
33,338		58.42% Pervious Area
23,725		41.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	128	0.0200	2.87		Shallow Concentrated Flow, BC
					Paved Kv= 20.3 fps
0.8	334	0.0250	7.17	5.63	Pipe Channel, CD
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013
8.9	512	Total			

Summary for Subcatchment PDA-13: All RD

Runoff = 0.63 cfs @ 12.24 hrs, Volume= 0.093 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
38,223	98	Paved parking, HSG A
56,327	39	>75% Grass cover, Good, HSG A
8,562	80	>75% Grass cover, Good, HSG D
16,475	30	Woods, Good, HSG A
119,587	60	Weighted Average
81,364		68.04% Pervious Area
38,223		31.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0080	0.10		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	99	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
2.0	262	0.0120	2.22		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
0.2	49	0.0100	4.54	3.56	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, straight & clean
11.0	460	Total			

Summary for Subcatchment PDA-14: Uncontrolled (All RD)

Runoff = 0.05 cfs @ 15.49 hrs, Volume= 0.030 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
* 2,604	98	ex roof
3,144	98	Paved parking, HSG A
* 1,928	98	ex. drive
89,823	39	>75% Grass cover, Good, HSG A
5,470	74	>75% Grass cover, Good, HSG C
172,955	30	Woods, Good, HSG A
3,247	70	Woods, Good, HSG C
74,983	77	Woods, Good, HSG D
354,154	45	Weighted Average
346,478		97.83% Pervious Area
7,676		2.17% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, bc Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment PDA-15: All RD

Runoff = 1.06 cfs @ 12.12 hrs, Volume= 0.085 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	24,480	98	roads,sidewalks, drives
	2,650	74	>75% Grass cover, Good, HSG C
	18,252	39	>75% Grass cover, Good, HSG A
	45,382	73	Weighted Average
	20,902		46.06% Pervious Area
	24,480		53.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	267	0.0200	2.87		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
7.2	317	Total			

Summary for Subcatchment PDA-16: All RD

Runoff = 1.41 cfs @ 12.11 hrs, Volume= 0.106 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	13,236	98	roads,sidewalks, drives
	8,144	74	>75% Grass cover, Good, HSG C
	7,558	80	>75% Grass cover, Good, HSG D
	28,938	87	Weighted Average
	15,702		54.26% Pervious Area
	13,236		45.74% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.3	122	0.0100	1.61		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.3	272	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	22,458	98	roads,sidewalks, drives
	16,513	39	>75% Grass cover, Good, HSG A
	38,971	73	Weighted Average
	16,513		42.37% Pervious Area
	22,458		57.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.2	24	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.2	50	0.0100	4.54	3.56	Pipe Channel, cd 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
6.0	124	Total			

Summary for Subcatchment PDA-19: All RD

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

Runoff = 0.90 cfs @ 12.09 hrs, Volume= 0.068 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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	Area (sf)	CN	Description
*	16,893	98	roads,sidewalks, drives
	12,029	39	>75% Grass cover, Good, HSG A
	5,192	80	>75% Grass cover, Good, HSG D
	34,114	74	Weighted Average
	17,221		50.48% Pervious Area
	16,893		49.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	32	0.0200	0.14		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	200	0.0100	2.03		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
5.5	232	Total			

Summary for Subcatchment PDA-20: Rear RD

Runoff = 2.09 cfs @ 12.10 hrs, Volume= 0.156 af, Depth= 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	15,182	98	roads,sidewalks, drives
	22,890	74	>75% Grass cover, Good, HSG C
	6,475	98	Unconnected roofs, HSG A
	44,547	86	Weighted Average
	22,890		51.38% Pervious Area
	21,657		48.62% Impervious Area
	6,475		29.90% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.1	14	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
1.0	147	0.0150	2.49		Shallow Concentrated Flow, cd Paved Kv= 20.3 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.1	311	Total			

Summary for Subcatchment PDA-25: Uncontrolled (All RD)

Runoff = 1.16 cfs @ 12.39 hrs, Volume= 0.259 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	6,815	98	Lots 82 and 83 long drive
	90,981	39	>75% Grass cover, Good, HSG A
	56,970	74	>75% Grass cover, Good, HSG C
	32,918	80	>75% Grass cover, Good, HSG D
	96,821	30	Woods, Good, HSG A
	29,256	70	Woods, Good, HSG C
	45,367	77	Woods, Good, HSG D
	82,670	51	1 acre lots, 20% imp, HSG A
	8,962	84	1 acre lots, 20% imp, HSG D
*	31,051	30	wetland HSG A
*	111,700	60	wetland, HSG D
*	1,780	98	ex drive
*	840	98	ex Roofs, HSG A
	7,761	39	>75% Grass cover, Good, HSG A
	1,680	30	Woods, Good, HSG A
	605,572	54	Weighted Average
	577,811		95.42% Pervious Area
	27,761		4.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
3.6	210	0.0370	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	260	Total			

Summary for Reach DP3: Central Swamp

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

Inflow Area = 33.180 ac, 15.64% Impervious, Inflow Depth = 0.13" for 2-Yr Storm event
Inflow = 1.28 cfs @ 12.39 hrs, Volume= 0.357 af
Outflow = 1.28 cfs @ 12.39 hrs, Volume= 0.357 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond B11: Det. Basin #11

Inflow Area = 0.783 ac, 49.52% Impervious, Inflow Depth = 1.04" for 2-Yr Storm event
 Inflow = 0.90 cfs @ 12.09 hrs, Volume= 0.068 af
 Outflow = 0.13 cfs @ 12.87 hrs, Volume= 0.068 af, Atten= 86%, Lag= 46.6 min
 Primary = 0.13 cfs @ 12.87 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.51' @ 12.87 hrs Surf.Area= 1,154 sf Storage= 1,029 cf

Plug-Flow detention time=85.0 min calculated for 0.068 af (100% of inflow)
 Center-of-Mass det. time= 84.8 min (946.4 - 861.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	269.00'	8,672 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.00	175	80.0	0	0	175
270.00	926	174.0	501	501	2,079
272.00	1,970	206.0	2,831	3,332	3,119
274.00	3,437	263.0	5,339	8,672	5,297

Device	Routing	Invert	Outlet Devices	
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600	
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height	

Primary OutFlow Max=0.13 cfs @ 12.87 hrs HW=270.51' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.13 cfs @ 5.75 fps)
 ↓ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B12: Basin #12

Inflow Area = 1.023 ac, 48.62% Impervious, Inflow Depth = 1.84" for 2-Yr Storm event
 Inflow = 2.09 cfs @ 12.10 hrs, Volume= 0.156 af
 Outflow = 0.49 cfs @ 12.53 hrs, Volume= 0.156 af, Atten= 76%, Lag= 25.4 min
 Discarded = 0.49 cfs @ 12.53 hrs, Volume= 0.156 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 269.22' @ 12.53 hrs Surf.Area= 2,578 sf Storage= 1,710 cf

Plug-Flow detention time= 22.2 min calculated for 0.156 af (100% of inflow)
 Center-of-Mass det. time= 22.2 min (845.8 - 823.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	268.50'	11,423 cf	Custom Stage Data (Irregular) Listed below (Recalc)		

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.50	2,158	188.0	0	0	2,158
269.00	2,446	197.0	1,150	1,150	2,450
271.00	3,754	238.0	6,153	7,304	3,934
272.00	4,496	257.0	4,119	11,423	4,723

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	271.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.49 cfs @ 12.53 hrs HW=269.22' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.49 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=268.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B13: Basin #13**

Inflow Area = 0.664 ac, 45.74% Impervious, Inflow Depth = 1.91" for 2-Yr Storm event
 Inflow = 1.41 cfs @ 12.11 hrs, Volume= 0.106 af
 Outflow = 0.10 cfs @ 13.75 hrs, Volume= 0.106 af, Atten= 93%, Lag= 98.7 min
 Discarded = 0.10 cfs @ 13.75 hrs, Volume= 0.106 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 272.62' @ 13.75 hrs Surf.Area= 1,859 sf Storage= 2,261 cf

Plug-Flow detention time= 256.0 min calculated for 0.106 af (100% of inflow)

Center-of-Mass det. time= 256.0 min (1,076.1 - 820.1)

Volume	Invert	Avail.Storage	Storage Description
#1	270.70'	11,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.70	550	130.0	0	0	550
272.00	1,434	243.0	1,245	1,245	3,913
274.00	3,007	281.0	4,345	5,590	5,582
274.50	3,436	290.0	1,610	7,199	6,015
275.50	4,335	309.0	3,877	11,076	6,969

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.50'	5.0' long x 20.0' 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
#3	Primary	273.50'	2.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.10 cfs @ 13.75 hrs HW=272.62' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=270.70' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond B14: Basin #14

Inflow Area = 1.042 ac, 53.94% Impervious, Inflow Depth = 0.98" for 2-Yr Storm event
 Inflow = 1.06 cfs @ 12.12 hrs, Volume= 0.085 af
 Outflow = 0.26 cfs @ 12.57 hrs, Volume= 0.085 af, Atten= 75%, Lag= 27.4 min
 Discarded = 0.26 cfs @ 12.57 hrs, Volume= 0.085 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 273.69' @ 12.57 hrs Surf.Area= 4,690 sf Storage= 888 cf

Plug-Flow detention time= 24.0 min calculated for 0.085 af (100% of inflow)
 Center-of-Mass det. time= 24.0 min (890.5 - 866.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	273.50'	15,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.50	4,528	279.4	0	0	4,528
274.00	4,954	288.8	2,370	2,370	4,976
275.00	6,429	397.9	5,676	8,045	10,948
276.00	7,651	416.8	7,031	15,076	12,239

Device	Routing	Invert	Outlet Devices									
#1	Discarded	273.50'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	275.00'	5.0' long x 20.0' 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									

Discarded OutFlow Max=0.26 cfs @ 12.57 hrs HW=273.69' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.50' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B4: Basin #4

Inflow Area = 2.686 ac, 25.60% Impervious, Inflow Depth = 0.15" for 2-Yr Storm event
 Inflow = 0.09 cfs @ 12.57 hrs, Volume= 0.034 af
 Outflow = 0.07 cfs @ 12.72 hrs, Volume= 0.034 af, Atten= 13%, Lag= 9.3 min
 Discarded = 0.07 cfs @ 12.72 hrs, Volume= 0.034 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.51' @ 12.72 hrs Surf.Area= 4,290 sf Storage= 33 cf

Plug-Flow detention time= 7.6 min calculated for 0.034 af (100% of inflow)
 Center-of-Mass det. time= 7.4 min (1,011.8 - 1,004.4)

Volume	Invert	Avail.Storage	Storage Description
#1	272.50'	14,869 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.50	4,280	318.0	0	0	4,280
274.00	6,339	407.0	7,914	7,914	9,443
275.00	7,590	426.0	6,955	14,869	10,770

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.24 cfs @ 12.72 hrs HW=272.51' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

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

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B5: Basin #5

Inflow Area = 1.310 ac, 41.58% Impervious, Inflow Depth = 0.56" for 2-Yr Storm event
 Inflow = 0.57 cfs @ 12.16 hrs, Volume= 0.061 af
 Outflow = 0.28 cfs @ 12.51 hrs, Volume= 0.061 af, Atten= 51%, Lag= 20.8 min
 Discarded = 0.28 cfs @ 12.51 hrs, Volume= 0.061 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.57' @ 12.51 hrs Surf.Area= 5,030 sf Storage= 332 cf

Plug-Flow detention time= 11.2 min calculated for 0.061 af (100% of inflow)
 Center-of-Mass det. time= 11.0 min (913.5 - 902.5)

Volume	Invert	Avail.Storage	Storage Description
#1	271.50'	19,582 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.50	4,974	279.7	0	0	4,974
272.00	5,401	289.2	2,593	2,593	5,427
274.00	7,683	346.1	13,017	15,610	8,373
274.50	8,209	355.5	3,972	19,582	8,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.00'	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

Discarded OutFlow Max=0.28 cfs @ 12.51 hrs HW=271.57' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.50' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B6: Basin #6

Inflow Area = 2.745 ac, 31.96% Impervious, Inflow Depth = 0.41" for 2-Yr Storm event
 Inflow = 0.63 cfs @ 12.24 hrs, Volume= 0.093 af
 Outflow = 0.63 cfs @ 12.25 hrs, Volume= 0.093 af, Atten= 0%, Lag= 0.6 min
 Discarded = 0.63 cfs @ 12.25 hrs, Volume= 0.093 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 268.71' @ 12.25 hrs Surf.Area= 2,699 sf Storage= 16 cf

Plug-Flow detention time=0.4 min calculated for 0.093 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (925.4 - 925.0)

Volume	Invert	Avail.Storage	Storage Description
#1	268.70'	8,348 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.70	2,694	252.1	0	0	2,694
270.00	3,755	283.2	4,173	4,173	4,064
271.00	4,611	297.2	4,176	8,348	4,772

Device	Routing	Invert	Outlet Devices
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Discarded	268.70'	2.41 cfs Exfiltration at all elevations
#3	Primary	270.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=2.41 cfs @ 12.25 hrs HW=268.71' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 2.41 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=268.70' (Free Discharge)

↑**1=Orifice/Grate** (Controls 0.00 cfs)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B9: Basin #9

Inflow Area = 0.895 ac, 57.63% Impervious, Inflow Depth = 0.98" for 2-Yr Storm event
 Inflow = 0.95 cfs @ 12.10 hrs, Volume= 0.073 af
 Outflow = 0.06 cfs @ 15.15 hrs, Volume= 0.073 af, Atten= 94%, Lag= 182.9 min
 Discarded = 0.06 cfs @ 15.15 hrs, Volume= 0.073 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 273.34' @ 15.15 hrs Surf.Area= 2,607 sf Storage= 1,523 cf

Plug-Flow detention time=280.3 min calculated for 0.073 af (100% of inflow)
 Center-of-Mass det. time= 280.2 min (1,145.6 - 865.4)

Volume	Invert	Avail.Storage	Storage Description
#1	272.70'	11,572 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.70	2,170	226.8	0	0	2,170
274.00	3,103	251.4	3,409	3,409	3,156
276.00	5,145	299.9	8,162	11,572	5,354

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.70'	1.020 in/hr Exfiltration over Surface area
#2	Primary	274.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600
#3	Primary	275.00'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Discarded OutFlow Max=0.06 cfs @ 15.15 hrs HW=273.34' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=272.70' (Free Discharge)
 ↑ **2=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment PDA-11: All RD

Runoff = 0.92 cfs @ 12.31 hrs, Volume= 0.140 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
29,960	98	Paved parking, HSG A
49,743	39	>75% Grass cover, Good, HSG A
37,306	30	Woods, Good, HSG A
117,009	51	Weighted Average
87,049		74.40% Pervious Area
29,960		25.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.0	198	0.0100	1.61		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
14.3	248	Total			

Summary for Subcatchment PDA-12: All RD

Runoff = 1.76 cfs @ 12.14 hrs, Volume= 0.152 af, Depth= 1.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
23,725	98	Paved parking, HSG A
33,222	39	>75% Grass cover, Good, HSG A
116	30	Woods, Good, HSG A
57,063	64	Weighted Average
33,338		58.42% Pervious Area
23,725		41.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	128	0.0200	2.87		Shallow Concentrated Flow, BC
					Paved Kv= 20.3 fps
0.8	334	0.0250	7.17	5.63	Pipe Channel, CD
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013
8.9	512	Total			

Summary for Subcatchment PDA-13: All RD

Runoff = 2.65 cfs @ 12.17 hrs, Volume= 0.258 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
38,223	98	Paved parking, HSG A
56,327	39	>75% Grass cover, Good, HSG A
8,562	80	>75% Grass cover, Good, HSG D
16,475	30	Woods, Good, HSG A
119,587	60	Weighted Average
81,364		68.04% Pervious Area
38,223		31.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0080	0.10		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	99	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
2.0	262	0.0120	2.22		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
0.2	49	0.0100	4.54	3.56	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, straight & clean
11.0	460	Total			

Summary for Subcatchment PDA-14: Uncontrolled (All RD)

Runoff = 1.04 cfs @ 12.47 hrs, Volume= 0.238 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
* 2,604	98	ex roof
3,144	98	Paved parking, HSG A
* 1,928	98	ex. drive
89,823	39	>75% Grass cover, Good, HSG A
5,470	74	>75% Grass cover, Good, HSG C
172,955	30	Woods, Good, HSG A
3,247	70	Woods, Good, HSG C
74,983	77	Woods, Good, HSG D
354,154	45	Weighted Average
346,478		97.83% Pervious Area
7,676		2.17% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, bc Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment PDA-15: All RD

Runoff = 2.34 cfs @ 12.11 hrs, Volume= 0.178 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	24,480	98	roads,sidewalks, drives
	2,650	74	>75% Grass cover, Good, HSG C
	18,252	39	>75% Grass cover, Good, HSG A
	45,382	73	Weighted Average
	20,902		46.06% Pervious Area
	24,480		53.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	267	0.0200	2.87		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
7.2	317	Total			

Summary for Subcatchment PDA-16: All RD

Runoff = 2.38 cfs @ 12.10 hrs, Volume= 0.182 af, Depth= 3.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	13,236	98	roads,sidewalks, drives
	8,144	74	>75% Grass cover, Good, HSG C
	7,558	80	>75% Grass cover, Good, HSG D
	28,938	87	Weighted Average
	15,702		54.26% Pervious Area
	13,236		45.74% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.3	122	0.0100	1.61		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.3	272	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 2.09 cfs @ 12.10 hrs, Volume= 0.153 af, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	22,458	98	roads,sidewalks, drives
	16,513	39	>75% Grass cover, Good, HSG A
	38,971	73	Weighted Average
	16,513		42.37% Pervious Area
	22,458		57.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.2	24	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.2	50	0.0100	4.54	3.56	Pipe Channel, cd 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
6.0	124	Total			

Summary for Subcatchment PDA-19: All RD

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

Runoff = 1.92 cfs @ 12.09 hrs, Volume= 0.139 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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	Area (sf)	CN	Description
*	16,893	98	roads,sidewalks, drives
	12,029	39	>75% Grass cover, Good, HSG A
	5,192	80	>75% Grass cover, Good, HSG D
	34,114	74	Weighted Average
	17,221		50.48% Pervious Area
	16,893		49.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	32	0.0200	0.14		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	200	0.0100	2.03		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
5.5	232	Total			

Summary for Subcatchment PDA-20: Rear RD

Runoff = 3.59 cfs @ 12.10 hrs, Volume= 0.272 af, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	15,182	98	roads,sidewalks, drives
	22,890	74	>75% Grass cover, Good, HSG C
	6,475	98	Unconnected roofs, HSG A
	44,547	86	Weighted Average
	22,890		51.38% Pervious Area
	21,657		48.62% Impervious Area
	6,475		29.90% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.1	14	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
1.0	147	0.0150	2.49		Shallow Concentrated Flow, cd Paved Kv= 20.3 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.1	311	Total			

Summary for Subcatchment PDA-25: Uncontrolled (All RD)

Runoff = 8.42 cfs @ 12.15 hrs, Volume= 0.903 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	6,815	98	Lots 82 and 83 long drive
	90,981	39	>75% Grass cover, Good, HSG A
	56,970	74	>75% Grass cover, Good, HSG C
	32,918	80	>75% Grass cover, Good, HSG D
	96,821	30	Woods, Good, HSG A
	29,256	70	Woods, Good, HSG C
	45,367	77	Woods, Good, HSG D
	82,670	51	1 acre lots, 20% imp, HSG A
	8,962	84	1 acre lots, 20% imp, HSG D
*	31,051	30	wetland HSG A
*	111,700	60	wetland, HSG D
*	1,780	98	ex drive
*	840	98	ex Roofs, HSG A
	7,761	39	>75% Grass cover, Good, HSG A
	1,680	30	Woods, Good, HSG A
	605,572	54	Weighted Average
	577,811		95.42% Pervious Area
	27,761		4.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
3.6	210	0.0370	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	260	Total			

Summary for Reach DP3: Central Swamp

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

Inflow Area = 33.180 ac, 15.64% Impervious, Inflow Depth = 0.47" for 10-Yr Storm event
Inflow = 8.69 cfs @ 12.16 hrs, Volume= 1.291 af
Outflow = 8.69 cfs @ 12.16 hrs, Volume= 1.291 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond B11: Det. Basin #11

Inflow Area = 0.783 ac, 49.52% Impervious, Inflow Depth = 2.13" for 10-Yr Storm event
 Inflow = 1.92 cfs @ 12.09 hrs, Volume= 0.139 af
 Outflow = 0.17 cfs @ 13.45 hrs, Volume= 0.139 af, Atten= 91%, Lag= 81.7 min
 Primary = 0.17 cfs @ 13.45 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.63' @ 13.45 hrs Surf.Area= 1,749 sf Storage= 2,650 cf

Plug-Flow detention time=175.9 min calculated for 0.139 af (100% of inflow)
 Center-of-Mass det. time= 175.7 min (1,015.8 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	269.00'	8,672 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.00	175	80.0	0	0	175
270.00	926	174.0	501	501	2,079
272.00	1,970	206.0	2,831	3,332	3,119
274.00	3,437	263.0	5,339	8,672	5,297

Device	Routing	Invert	Outlet Devices
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height

Primary OutFlow Max=0.17 cfs @ 13.45 hrs HW=271.63' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.17 cfs @ 7.69 fps)
 ↓ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B12: Basin #12

Inflow Area = 1.023 ac, 48.62% Impervious, Inflow Depth = 3.19" for 10-Yr Storm event
 Inflow = 3.59 cfs @ 12.10 hrs, Volume= 0.272 af
 Outflow = 0.58 cfs @ 12.61 hrs, Volume= 0.272 af, Atten= 84%, Lag= 30.6 min
 Discarded = 0.58 cfs @ 12.61 hrs, Volume= 0.272 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 269.97' @ 12.61 hrs Surf.Area= 3,043 sf Storage= 3,796 cf

Plug-Flow detention time=49.0 min calculated for 0.271 af (100% of inflow)
 Center-of-Mass det. time= 48.9 min (856.7 - 807.8)

Volume	Invert	Avail.Storage	Storage Description
#1	268.50'	11,423 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.50	2,158	188.0	0	0	2,158
269.00	2,446	197.0	1,150	1,150	2,450
271.00	3,754	238.0	6,153	7,304	3,934
272.00	4,496	257.0	4,119	11,423	4,723

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	271.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.58 cfs @ 12.61 hrs HW=269.97' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.58 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=268.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B13: Basin #13**

Inflow Area = 0.664 ac, 45.74% Impervious, Inflow Depth = 3.29" for 10-Yr Storm event
 Inflow = 2.38 cfs @ 12.10 hrs, Volume= 0.182 af
 Outflow = 0.15 cfs @ 14.03 hrs, Volume= 0.174 af, Atten= 94%, Lag= 115.4 min
 Discarded = 0.14 cfs @ 14.03 hrs, Volume= 0.174 af
 Primary = 0.00 cfs @ 14.03 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 273.53' @ 14.03 hrs Surf.Area= 2,588 sf Storage= 4,284 cf

Plug-Flow detention time= 350.2 min calculated for 0.174 af (96% of inflow)

Center-of-Mass det. time= 326.0 min (1,130.7 - 804.7)

Volume	Invert	Avail.Storage	Storage Description
#1	270.70'	11,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.70	550	130.0	0	0	550
272.00	1,434	243.0	1,245	1,245	3,913
274.00	3,007	281.0	4,345	5,590	5,582
274.50	3,436	290.0	1,610	7,199	6,015
275.50	4,335	309.0	3,877	11,076	6,969

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.50'	5.0' long x 20.0' 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
#3	Primary	273.50'	2.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.14 cfs @ 14.03 hrs HW=273.53' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.14 cfs)

Primary OutFlow Max=0.00 cfs @ 14.03 hrs HW=273.53' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

↑**3=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.62 fps)

Summary for Pond B14: Basin #14

Inflow Area = 1.042 ac, 53.94% Impervious, Inflow Depth = 2.05" for 10-Yr Storm event
 Inflow = 2.34 cfs @ 12.11 hrs, Volume= 0.178 af
 Outflow = 0.28 cfs @ 12.97 hrs, Volume= 0.178 af, Atten= 88%, Lag= 51.9 min
 Discarded = 0.28 cfs @ 12.97 hrs, Volume= 0.178 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 274.08' @ 12.97 hrs Surf.Area= 5,068 sf Storage= 2,783 cf

Plug-Flow detention time=87.4 min calculated for 0.177 af (100% of inflow)
 Center-of-Mass det. time= 87.3 min (931.5 - 844.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	273.50'	15,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.50	4,528	279.4	0	0	4,528
274.00	4,954	288.8	2,370	2,370	4,976
275.00	6,429	397.9	5,676	8,045	10,948
276.00	7,651	416.8	7,031	15,076	12,239

Device	Routing	Invert	Outlet Devices									
#1	Discarded	273.50'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	275.00'	5.0' long x 20.0' 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									

Discarded OutFlow Max=0.28 cfs @ 12.97 hrs HW=274.08' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.50' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B4: Basin #4

Inflow Area = 2.686 ac, 25.60% Impervious, Inflow Depth = 0.62" for 10-Yr Storm event
 Inflow = 0.92 cfs @ 12.31 hrs, Volume= 0.140 af
 Outflow = 0.26 cfs @ 13.21 hrs, Volume= 0.140 af, Atten= 72%, Lag= 54.0 min
 Discarded = 0.26 cfs @ 13.21 hrs, Volume= 0.140 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.77' @ 13.21 hrs Surf.Area= 4,627 sf Storage= 1,223 cf

Plug-Flow detention time= 40.5 min calculated for 0.139 af (100% of inflow)
 Center-of-Mass det. time= 40.4 min (965.9 - 925.5)

Volume	Invert	Avail.Storage	Storage Description
#1	272.50'	14,869 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.50	4,280	318.0	0	0	4,280
274.00	6,339	407.0	7,914	7,914	9,443
275.00	7,590	426.0	6,955	14,869	10,770

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.26 cfs @ 13.21 hrs HW=272.77' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

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

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B5: Basin #5

Inflow Area = 1.310 ac, 41.58% Impervious, Inflow Depth = 1.39" for 10-Yr Storm event
 Inflow = 1.76 cfs @ 12.14 hrs, Volume= 0.152 af
 Outflow = 0.30 cfs @ 12.89 hrs, Volume= 0.152 af, Atten= 83%, Lag= 44.7 min
 Discarded = 0.30 cfs @ 12.89 hrs, Volume= 0.152 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.89' @ 12.89 hrs Surf.Area= 5,305 sf Storage= 2,003 cf

Plug-Flow detention time= 57.3 min calculated for 0.152 af (100% of inflow)
 Center-of-Mass det. time= 57.1 min (927.5 - 870.4)

Volume	Invert	Avail.Storage	Storage Description
#1	271.50'	19,582 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.50	4,974	279.7	0	0	4,974
272.00	5,401	289.2	2,593	2,593	5,427
274.00	7,683	346.1	13,017	15,610	8,373
274.50	8,209	355.5	3,972	19,582	8,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.00'	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

Discarded OutFlow Max=0.30 cfs @ 12.89 hrs HW=271.89' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.50' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B6: Basin #6

Inflow Area = 2.745 ac, 31.96% Impervious, Inflow Depth = 1.13" for 10-Yr Storm event
 Inflow = 2.65 cfs @ 12.17 hrs, Volume= 0.258 af
 Outflow = 2.41 cfs @ 12.15 hrs, Volume= 0.258 af, Atten= 9%, Lag= 0.0 min
 Discarded = 2.41 cfs @ 12.15 hrs, Volume= 0.258 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 268.74' @ 12.23 hrs Surf.Area= 2,726 sf Storage= 117 cf

Plug-Flow detention time=0.5 min calculated for 0.258 af (100% of inflow)
 Center-of-Mass det. time= 0.5 min (885.3 - 884.8)

Volume	Invert	Avail.Storage	Storage Description
#1	268.70'	8,348 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.70	2,694	252.1	0	0	2,694
270.00	3,755	283.2	4,173	4,173	4,064
271.00	4,611	297.2	4,176	8,348	4,772

Device	Routing	Invert	Outlet Devices
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Discarded	268.70'	2.41 cfs Exfiltration at all elevations
#3	Primary	270.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=2.41 cfs @ 12.15 hrs HW=268.73' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 2.41 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=268.70' (Free Discharge)

↑**1=Orifice/Grate** (Controls 0.00 cfs)

↑**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B9: Basin #9

Inflow Area = 0.895 ac, 57.63% Impervious, Inflow Depth = 2.05" for 10-Yr Storm event
 Inflow = 2.09 cfs @ 12.10 hrs, Volume= 0.153 af
 Outflow = 0.12 cfs @ 14.84 hrs, Volume= 0.121 af, Atten= 94%, Lag= 164.9 min
 Discarded = 0.08 cfs @ 14.84 hrs, Volume= 0.110 af
 Primary = 0.05 cfs @ 14.84 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 274.10' @ 14.84 hrs Surf.Area= 3,192 sf Storage= 3,719 cf

Plug-Flow detention time=425.7 min calculated for 0.121 af (79% of inflow)
 Center-of-Mass det. time= 345.2 min (1,188.3 - 843.1)

Volume	Invert	Avail.Storage	Storage Description
#1	272.70'	11,572 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.70	2,170	226.8	0	0	2,170
274.00	3,103	251.4	3,409	3,409	3,156
276.00	5,145	299.9	8,162	11,572	5,354

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.70'	1.020 in/hr Exfiltration over Surface area
#2	Primary	274.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600
#3	Primary	275.00'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Discarded OutFlow Max=0.08 cfs @ 14.84 hrs HW=274.10' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.05 cfs @ 14.84 hrs HW=274.10' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 1.07 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment PDA-11: All RD

Runoff = 1.74 cfs @ 12.25 hrs, Volume= 0.217 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
29,960	98	Paved parking, HSG A
49,743	39	>75% Grass cover, Good, HSG A
37,306	30	Woods, Good, HSG A
117,009	51	Weighted Average
87,049		74.40% Pervious Area
29,960		25.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.0	198	0.0100	1.61		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
14.3	248	Total			

Summary for Subcatchment PDA-12: All RD

Runoff = 2.50 cfs @ 12.14 hrs, Volume= 0.209 af, Depth= 1.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
23,725	98	Paved parking, HSG A
33,222	39	>75% Grass cover, Good, HSG A
116	30	Woods, Good, HSG A
57,063	64	Weighted Average
33,338		58.42% Pervious Area
23,725		41.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	128	0.0200	2.87		Shallow Concentrated Flow, BC
					Paved Kv= 20.3 fps
0.8	334	0.0250	7.17	5.63	Pipe Channel, CD
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
8.9	512	Total			

Summary for Subcatchment PDA-13: All RD

Runoff = 3.99 cfs @ 12.17 hrs, Volume= 0.367 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
38,223	98	Paved parking, HSG A
56,327	39	>75% Grass cover, Good, HSG A
8,562	80	>75% Grass cover, Good, HSG D
16,475	30	Woods, Good, HSG A
119,587	60	Weighted Average
81,364		68.04% Pervious Area
38,223		31.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0080	0.10		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	99	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
2.0	262	0.0120	2.22		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
0.2	49	0.0100	4.54	3.56	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, straight & clean
11.0	460	Total			

Summary for Subcatchment PDA-14: Uncontrolled (All RD)

Runoff = 2.40 cfs @ 12.37 hrs, Volume= 0.414 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
* 2,604	98	ex roof
3,144	98	Paved parking, HSG A
* 1,928	98	ex. drive
89,823	39	>75% Grass cover, Good, HSG A
5,470	74	>75% Grass cover, Good, HSG C
172,955	30	Woods, Good, HSG A
3,247	70	Woods, Good, HSG C
74,983	77	Woods, Good, HSG D
354,154	45	Weighted Average
346,478		97.83% Pervious Area
7,676		2.17% Impervious Area

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Type III 24-Hr 25-yr Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, bc Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment PDA-15: All RD

Runoff = 3.09 cfs @ 12.11 hrs, Volume= 0.233 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	24,480	98	roads,sidewalks, drives
	2,650	74	>75% Grass cover, Good, HSG C
	18,252	39	>75% Grass cover, Good, HSG A
	45,382	73	Weighted Average
	20,902		46.06% Pervious Area
	24,480		53.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	267	0.0200	2.87		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
7.2	317	Total			

Summary for Subcatchment PDA-16: All RD

Runoff = 2.90 cfs @ 12.10 hrs, Volume= 0.224 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	13,236	98	roads,sidewalks, drives
	8,144	74	>75% Grass cover, Good, HSG C
	7,558	80	>75% Grass cover, Good, HSG D
	28,938	87	Weighted Average
	15,702		54.26% Pervious Area
	13,236		45.74% Impervious Area

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Type III 24-Hr 25-yr Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.3	122	0.0100	1.61		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.3	272	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 2.75 cfs @ 12.09 hrs, Volume= 0.200 af, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	22,458	98	roads,sidewalks, drives
	16,513	39	>75% Grass cover, Good, HSG A
	38,971	73	Weighted Average
	16,513		42.37% Pervious Area
	22,458		57.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.2	24	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.2	50	0.0100	4.54	3.56	Pipe Channel, cd 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
6.0	124	Total			

Summary for Subcatchment PDA-19: All RD

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

Runoff = 2.52 cfs @ 12.09 hrs, Volume= 0.181 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

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Type III 24-Hr 25-yr Rainfall=5.50"

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	Area (sf)	CN	Description
*	16,893	98	roads,sidewalks, drives
	12,029	39	>75% Grass cover, Good, HSG A
	5,192	80	>75% Grass cover, Good, HSG D
	34,114	74	Weighted Average
	17,221		50.48% Pervious Area
	16,893		49.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	32	0.0200	0.14		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	200	0.0100	2.03		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
5.5	232	Total			

Summary for Subcatchment PDA-20: Rear RD

Runoff = 4.40 cfs @ 12.10 hrs, Volume= 0.335 af, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	15,182	98	roads,sidewalks, drives
	22,890	74	>75% Grass cover, Good, HSG C
	6,475	98	Unconnected roofs, HSG A
	44,547	86	Weighted Average
	22,890		51.38% Pervious Area
	21,657		48.62% Impervious Area
	6,475		29.90% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.1	14	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
1.0	147	0.0150	2.49		Shallow Concentrated Flow, cd Paved Kv= 20.3 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.1	311	Total			

Summary for Subcatchment PDA-25: Uncontrolled (All RD)

Runoff = 14.44 cfs @ 12.14 hrs, Volume= 1.356 af, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	6,815	98	Lots 82 and 83 long drive
	90,981	39	>75% Grass cover, Good, HSG A
	56,970	74	>75% Grass cover, Good, HSG C
	32,918	80	>75% Grass cover, Good, HSG D
	96,821	30	Woods, Good, HSG A
	29,256	70	Woods, Good, HSG C
	45,367	77	Woods, Good, HSG D
	82,670	51	1 acre lots, 20% imp, HSG A
	8,962	84	1 acre lots, 20% imp, HSG D
*	31,051	30	wetland HSG A
*	111,700	60	wetland, HSG D
*	1,780	98	ex drive
*	840	98	ex Roofs, HSG A
	7,761	39	>75% Grass cover, Good, HSG A
	1,680	30	Woods, Good, HSG A
	605,572	54	Weighted Average
	577,811		95.42% Pervious Area
	27,761		4.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
3.6	210	0.0370	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	260	Total			

Summary for Reach DP3: Central Swamp

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

Inflow Area = 33.180 ac, 15.64% Impervious, Inflow Depth = 0.73" for 25-yr event
Inflow = 15.63 cfs @ 12.15 hrs, Volume= 2.015 af
Outflow = 15.63 cfs @ 12.15 hrs, Volume= 2.015 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond B11: Det. Basin #11

Inflow Area = 0.783 ac, 49.52% Impervious, Inflow Depth = 2.77" for 25-yr event
 Inflow = 2.52 cfs @ 12.09 hrs, Volume= 0.181 af
 Outflow = 0.19 cfs @ 13.79 hrs, Volume= 0.181 af, Atten= 93%, Lag= 102.3 min
 Primary = 0.19 cfs @ 13.79 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.19' @ 13.79 hrs Surf.Area= 2,092 sf Storage= 3,717 cf

Plug-Flow detention time=226.7 min calculated for 0.181 af (100% of inflow)
 Center-of-Mass det. time= 226.6 min (1,059.0 - 832.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	269.00'	8,672 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.00	175	80.0	0	0	175
270.00	926	174.0	501	501	2,079
272.00	1,970	206.0	2,831	3,332	3,119
274.00	3,437	263.0	5,339	8,672	5,297

Device	Routing	Invert	Outlet Devices	
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600	
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height	

Primary OutFlow Max=0.19 cfs @ 13.79 hrs HW=272.19' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.19 cfs @ 8.49 fps)
 ↓ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B12: Basin #12

Inflow Area = 1.023 ac, 48.62% Impervious, Inflow Depth = 3.94" for 25-yr event
 Inflow = 4.40 cfs @ 12.10 hrs, Volume= 0.335 af
 Outflow = 0.63 cfs @ 12.65 hrs, Volume= 0.335 af, Atten= 86%, Lag= 33.1 min
 Discarded = 0.63 cfs @ 12.65 hrs, Volume= 0.335 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.34' @ 12.65 hrs Surf.Area= 3,292 sf Storage= 4,985 cf

Plug-Flow detention time=62.8 min calculated for 0.335 af (100% of inflow)
 Center-of-Mass det. time= 62.7 min (864.6 - 801.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	268.50'	11,423 cf	Custom Stage Data (Irregular) Listed below (Recalc)		

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Type III 24-Hr 25-yr Rainfall=5.50"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.50	2,158	188.0	0	0	2,158
269.00	2,446	197.0	1,150	1,150	2,450
271.00	3,754	238.0	6,153	7,304	3,934
272.00	4,496	257.0	4,119	11,423	4,723

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	271.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.63 cfs @ 12.65 hrs HW=270.34' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.63 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=268.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B13: Basin #13**

Inflow Area = 0.664 ac, 45.74% Impervious, Inflow Depth = 4.04" for 25-yr event
 Inflow = 2.90 cfs @ 12.10 hrs, Volume= 0.224 af
 Outflow = 0.22 cfs @ 13.51 hrs, Volume= 0.210 af, Atten= 93%, Lag= 84.6 min
 Discarded = 0.16 cfs @ 13.51 hrs, Volume= 0.194 af
 Primary = 0.06 cfs @ 13.51 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 273.86' @ 13.51 hrs Surf.Area= 2,880 sf Storage= 5,183 cf

Plug-Flow detention time= 341.9 min calculated for 0.210 af (94% of inflow)
 Center-of-Mass det. time= 309.4 min (1,108.4 - 799.0)

Volume	Invert	Avail.Storage	Storage Description
#1	270.70'	11,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.70	550	130.0	0	0	550
272.00	1,434	243.0	1,245	1,245	3,913
274.00	3,007	281.0	4,345	5,590	5,582
274.50	3,436	290.0	1,610	7,199	6,015
275.50	4,335	309.0	3,877	11,076	6,969

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.50'	5.0' long x 20.0' 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
#3	Primary	273.50'	2.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.16 cfs @ 13.51 hrs HW=273.86' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.06 cfs @ 13.51 hrs HW=273.86' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

↑**3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 2.54 fps)

Summary for Pond B14: Basin #14

Inflow Area = 1.042 ac, 53.94% Impervious, Inflow Depth = 2.68" for 25-yr event
 Inflow = 3.09 cfs @ 12.11 hrs, Volume= 0.233 af
 Outflow = 0.30 cfs @ 13.19 hrs, Volume= 0.233 af, Atten= 90%, Lag= 64.8 min
 Discarded = 0.30 cfs @ 13.19 hrs, Volume= 0.233 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 274.32' @ 13.19 hrs Surf.Area= 5,404 sf Storage= 4,024 cf

Plug-Flow detention time= 127.3 min calculated for 0.232 af (100% of inflow)
 Center-of-Mass det. time= 127.1 min (963.5 - 836.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	273.50'	15,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.50	4,528	279.4	0	0	4,528
274.00	4,954	288.8	2,370	2,370	4,976
275.00	6,429	397.9	5,676	8,045	10,948
276.00	7,651	416.8	7,031	15,076	12,239

Device	Routing	Invert	Outlet Devices									
#1	Discarded	273.50'	2.410 in/hr Exfiltration over Surface area									
#2	Primary	275.00'	5.0' long x 20.0' 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									

Discarded OutFlow Max=0.30 cfs @ 13.19 hrs HW=274.32' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.50' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B4: Basin #4

Inflow Area = 2.686 ac, 25.60% Impervious, Inflow Depth = 0.97" for 25-yr event
 Inflow = 1.74 cfs @ 12.25 hrs, Volume= 0.217 af
 Outflow = 0.28 cfs @ 14.12 hrs, Volume= 0.217 af, Atten= 84%, Lag= 111.9 min
 Discarded = 0.28 cfs @ 14.12 hrs, Volume= 0.217 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Type III 24-Hr 25-yr Rainfall=5.50"

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Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 273.14' @ 14.12 hrs Surf.Area= 5,107 sf Storage= 2,991 cf

Plug-Flow detention time=109.4 min calculated for 0.217 af (100% of inflow)
 Center-of-Mass det. time= 109.3 min (1,016.1 - 906.9)

Volume	Invert	Avail.Storage	Storage Description
#1	272.50'	14,869 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.50	4,280	318.0	0	0	4,280
274.00	6,339	407.0	7,914	7,914	9,443
275.00	7,590	426.0	6,955	14,869	10,770

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.28 cfs @ 14.12 hrs HW=273.14' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

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

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B5: Basin #5

Inflow Area = 1.310 ac, 41.58% Impervious, Inflow Depth = 1.91" for 25-yr event
 Inflow = 2.50 cfs @ 12.14 hrs, Volume= 0.209 af
 Outflow = 0.31 cfs @ 13.16 hrs, Volume= 0.209 af, Atten= 88%, Lag= 61.3 min
 Discarded = 0.31 cfs @ 13.16 hrs, Volume= 0.209 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.13' @ 13.16 hrs Surf.Area= 5,533 sf Storage= 3,282 cf

Plug-Flow detention time=100.2 min calculated for 0.209 af (100% of inflow)
 Center-of-Mass det. time= 100.0 min (960.4 - 860.4)

Volume	Invert	Avail.Storage	Storage Description
#1	271.50'	19,582 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.50	4,974	279.7	0	0	4,974
272.00	5,401	289.2	2,593	2,593	5,427
274.00	7,683	346.1	13,017	15,610	8,373
274.50	8,209	355.5	3,972	19,582	8,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.00'	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

Discarded OutFlow Max=0.31 cfs @ 13.16 hrs HW=272.13' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.31 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.50' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B6: Basin #6

Inflow Area = 2.745 ac, 31.96% Impervious, Inflow Depth = 1.60" for 25-yr event
 Inflow = 3.99 cfs @ 12.17 hrs, Volume= 0.367 af
 Outflow = 2.42 cfs @ 12.39 hrs, Volume= 0.367 af, Atten= 39%, Lag= 13.5 min
 Discarded = 2.41 cfs @ 12.10 hrs, Volume= 0.367 af
 Primary = 0.01 cfs @ 12.39 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 269.08' @ 12.39 hrs Surf.Area= 2,983 sf Storage= 1,067 cf

Plug-Flow detention time=2.0 min calculated for 0.366 af (100% of inflow)
 Center-of-Mass det. time= 2.0 min (875.2 - 873.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	268.70'	8,348 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.70	2,694	252.1	0	0	2,694
270.00	3,755	283.2	4,173	4,173	4,064
271.00	4,611	297.2	4,176	8,348	4,772

Device	Routing	Invert	Outlet Devices
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Discarded	268.70'	2.41 cfs Exfiltration at all elevations
#3	Primary	270.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=2.41 cfs @ 12.10 hrs HW=268.75' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 2.41 cfs)

Primary OutFlow Max=0.01 cfs @ 12.39 hrs HW=269.08' (Free Discharge)

↑**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.93 fps)

↑**3=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B9: Basin #9

Inflow Area = 0.895 ac, 57.63% Impervious, Inflow Depth = 2.68" for 25-yr event
 Inflow = 2.75 cfs @ 12.09 hrs, Volume= 0.200 af
 Outflow = 0.29 cfs @ 13.00 hrs, Volume= 0.164 af, Atten= 89%, Lag= 54.3 min
 Discarded = 0.08 cfs @ 13.00 hrs, Volume= 0.115 af
 Primary = 0.22 cfs @ 13.00 hrs, Volume= 0.048 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 274.23' @ 13.00 hrs Surf.Area= 3,315 sf Storage= 4,159 cf

Plug-Flow detention time=337.8 min calculated for 0.163 af (82% of inflow)
 Center-of-Mass det. time= 264.5 min (1,099.8 - 835.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	272.70'	11,572 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.70	2,170	226.8	0	0	2,170
274.00	3,103	251.4	3,409	3,409	3,156
276.00	5,145	299.9	8,162	11,572	5,354

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.70'	1.020 in/hr Exfiltration over Surface area
#2	Primary	274.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600
#3	Primary	275.00'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Discarded OutFlow Max=0.08 cfs @ 13.00 hrs HW=274.23' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.22 cfs @ 13.00 hrs HW=274.23' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.22 cfs @ 1.65 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment PDA-11: All RD

Runoff = 3.27 cfs @ 12.23 hrs, Volume= 0.355 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
29,960	98	Paved parking, HSG A
49,743	39	>75% Grass cover, Good, HSG A
37,306	30	Woods, Good, HSG A
117,009	51	Weighted Average
87,049		74.40% Pervious Area
29,960		25.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, AB
					Woods: Light underbrush n= 0.400 P2= 3.20"
2.0	198	0.0100	1.61		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
14.3	248	Total			

Summary for Subcatchment PDA-12: All RD

Runoff = 3.72 cfs @ 12.13 hrs, Volume= 0.303 af, Depth= 2.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
23,725	98	Paved parking, HSG A
33,222	39	>75% Grass cover, Good, HSG A
116	30	Woods, Good, HSG A
57,063	64	Weighted Average
33,338		58.42% Pervious Area
23,725		41.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	50	0.0100	0.11		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	128	0.0200	2.87		Shallow Concentrated Flow, BC
					Paved Kv= 20.3 fps
0.8	334	0.0250	7.17	5.63	Pipe Channel, CD
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013
8.9	512	Total			

Summary for Subcatchment PDA-13: All RD

Runoff = 6.22 cfs @ 12.16 hrs, Volume= 0.548 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
38,223	98	Paved parking, HSG A
56,327	39	>75% Grass cover, Good, HSG A
8,562	80	>75% Grass cover, Good, HSG D
16,475	30	Woods, Good, HSG A
119,587	60	Weighted Average
81,364		68.04% Pervious Area
38,223		31.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	50	0.0080	0.10		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.7	99	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
2.0	262	0.0120	2.22		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
0.2	49	0.0100	4.54	3.56	Pipe Channel, DE
					12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'
					n= 0.013 Concrete pipe, straight & clean
11.0	460	Total			

Summary for Subcatchment PDA-14: Uncontrolled (All RD)

Runoff = 5.73 cfs @ 12.26 hrs, Volume= 0.745 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
* 2,604	98	ex roof
3,144	98	Paved parking, HSG A
* 1,928	98	ex. drive
89,823	39	>75% Grass cover, Good, HSG A
5,470	74	>75% Grass cover, Good, HSG C
172,955	30	Woods, Good, HSG A
3,247	70	Woods, Good, HSG C
74,983	77	Woods, Good, HSG D
354,154	45	Weighted Average
346,478		97.83% Pervious Area
7,676		2.17% Impervious Area

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1	50	0.0260	0.08		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
3.1	187	0.0400	1.00		Shallow Concentrated Flow, bc Woodland Kv= 5.0 fps
14.2	237	Total			

Summary for Subcatchment PDA-15: All RD

Runoff = 4.26 cfs @ 12.11 hrs, Volume= 0.319 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	24,480	98	roads,sidewalks, drives
	2,650	74	>75% Grass cover, Good, HSG C
	18,252	39	>75% Grass cover, Good, HSG A
	45,382	73	Weighted Average
	20,902		46.06% Pervious Area
	24,480		53.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	267	0.0200	2.87		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
7.2	317	Total			

Summary for Subcatchment PDA-16: All RD

Runoff = 3.68 cfs @ 12.10 hrs, Volume= 0.287 af, Depth= 5.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	13,236	98	roads,sidewalks, drives
	8,144	74	>75% Grass cover, Good, HSG C
	7,558	80	>75% Grass cover, Good, HSG D
	28,938	87	Weighted Average
	15,702		54.26% Pervious Area
	13,236		45.74% Impervious Area

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.3	122	0.0100	1.61		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.3	272	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 3.78 cfs @ 12.09 hrs, Volume= 0.274 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	22,458	98	roads,sidewalks, drives
	16,513	39	>75% Grass cover, Good, HSG A
	38,971	73	Weighted Average
	16,513		42.37% Pervious Area
	22,458		57.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.2	24	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
0.2	50	0.0100	4.54	3.56	Pipe Channel, cd 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
6.0	124	Total			

Summary for Subcatchment PDA-19: All RD

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

Runoff = 3.44 cfs @ 12.09 hrs, Volume= 0.247 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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	Area (sf)	CN	Description
*	16,893	98	roads,sidewalks, drives
	12,029	39	>75% Grass cover, Good, HSG A
	5,192	80	>75% Grass cover, Good, HSG D
	34,114	74	Weighted Average
	17,221		50.48% Pervious Area
	16,893		49.52% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	32	0.0200	0.14		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
1.6	200	0.0100	2.03		Shallow Concentrated Flow, bc Paved Kv= 20.3 fps
5.5	232	Total			

Summary for Subcatchment PDA-20: Rear RD

Runoff = 5.61 cfs @ 12.10 hrs, Volume= 0.433 af, Depth= 5.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	15,182	98	roads,sidewalks, drives
	22,890	74	>75% Grass cover, Good, HSG C
	6,475	98	Unconnected roofs, HSG A
	44,547	86	Weighted Average
	22,890		51.38% Pervious Area
	21,657		48.62% Impervious Area
	6,475		29.90% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab Grass: Short n= 0.150 P2= 3.20"
0.1	14	0.0200	2.28		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
1.0	147	0.0150	2.49		Shallow Concentrated Flow, cd Paved Kv= 20.3 fps
0.4	100	0.0100	4.54	3.56	Pipe Channel, de 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
7.1	311	Total			

Summary for Subcatchment PDA-25: Uncontrolled (All RD)

Runoff = 24.95 cfs @ 12.13 hrs, Volume= 2.140 af, Depth= 1.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	6,815	98	Lots 82 and 83 long drive
	90,981	39	>75% Grass cover, Good, HSG A
	56,970	74	>75% Grass cover, Good, HSG C
	32,918	80	>75% Grass cover, Good, HSG D
	96,821	30	Woods, Good, HSG A
	29,256	70	Woods, Good, HSG C
	45,367	77	Woods, Good, HSG D
	82,670	51	1 acre lots, 20% imp, HSG A
	8,962	84	1 acre lots, 20% imp, HSG D
*	31,051	30	wetland HSG A
*	111,700	60	wetland, HSG D
*	1,780	98	ex drive
*	840	98	ex Roofs, HSG A
	7,761	39	>75% Grass cover, Good, HSG A
	1,680	30	Woods, Good, HSG A
	605,572	54	Weighted Average
	577,811		95.42% Pervious Area
	27,761		4.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 3.20"
3.6	210	0.0370	0.96		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
7.9	260	Total			

Summary for Reach DP3: Central Swamp

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

Inflow Area = 33.180 ac, 15.64% Impervious, Inflow Depth = 1.19" for 100-Yr Storm event
Inflow = 29.06 cfs @ 12.15 hrs, Volume= 3.290 af
Outflow = 29.06 cfs @ 12.15 hrs, Volume= 3.290 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond B11: Det. Basin #11

Inflow Area = 0.783 ac, 49.52% Impervious, Inflow Depth = 3.78" for 100-Yr Storm event
 Inflow = 3.44 cfs @ 12.09 hrs, Volume= 0.247 af
 Outflow = 0.21 cfs @ 14.20 hrs, Volume= 0.247 af, Atten= 94%, Lag= 127.1 min
 Primary = 0.21 cfs @ 14.20 hrs, Volume= 0.247 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.95' @ 14.20 hrs Surf.Area= 2,619 sf Storage= 5,515 cf

Plug-Flow detention time= 301.8 min calculated for 0.246 af (100% of inflow)
 Center-of-Mass det. time= 301.6 min (1,125.0 - 823.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	269.00'	8,672 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.00	175	80.0	0	0	175
270.00	926	174.0	501	501	2,079
272.00	1,970	206.0	2,831	3,332	3,119
274.00	3,437	263.0	5,339	8,672	5,297

Device	Routing	Invert	Outlet Devices	
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600	
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 4.0' Crest Height	

Primary OutFlow Max=0.21 cfs @ 14.20 hrs HW=272.95' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 0.21 cfs @ 9.47 fps)
 ↓ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B12: Basin #12

Inflow Area = 1.023 ac, 48.62% Impervious, Inflow Depth = 5.08" for 100-Yr Storm event
 Inflow = 5.61 cfs @ 12.10 hrs, Volume= 0.433 af
 Outflow = 0.70 cfs @ 12.73 hrs, Volume= 0.433 af, Atten= 87%, Lag= 37.6 min
 Discarded = 0.70 cfs @ 12.73 hrs, Volume= 0.433 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.88' @ 12.73 hrs Surf.Area= 3,670 sf Storage= 6,872 cf

Plug-Flow detention time= 82.6 min calculated for 0.433 af (100% of inflow)
 Center-of-Mass det. time= 82.5 min (877.3 - 794.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	268.50'	11,423 cf	Custom Stage Data (Irregular) Listed below (Recalc)		

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.50	2,158	188.0	0	0	2,158
269.00	2,446	197.0	1,150	1,150	2,450
271.00	3,754	238.0	6,153	7,304	3,934
272.00	4,496	257.0	4,119	11,423	4,723

Device	Routing	Invert	Outlet Devices
#1	Discarded	268.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	271.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.70 cfs @ 12.73 hrs HW=270.88' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.70 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=268.50' (Free Discharge)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B13: Basin #13**

Inflow Area = 0.664 ac, 45.74% Impervious, Inflow Depth = 5.19" for 100-Yr Storm event
 Inflow = 3.68 cfs @ 12.10 hrs, Volume= 0.287 af
 Outflow = 0.28 cfs @ 13.43 hrs, Volume= 0.265 af, Atten= 92%, Lag= 79.4 min
 Discarded = 0.18 cfs @ 13.43 hrs, Volume= 0.224 af
 Primary = 0.09 cfs @ 13.43 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.36' @ 13.43 hrs Surf.Area= 3,315 sf Storage= 6,736 cf

Plug-Flow detention time= 337.1 min calculated for 0.265 af (92% of inflow)

Center-of-Mass det. time= 297.5 min (1,089.6 - 792.0)

Volume	Invert	Avail.Storage	Storage Description
#1	270.70'	11,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.70	550	130.0	0	0	550
272.00	1,434	243.0	1,245	1,245	3,913
274.00	3,007	281.0	4,345	5,590	5,582
274.50	3,436	290.0	1,610	7,199	6,015
275.50	4,335	309.0	3,877	11,076	6,969

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.70'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.50'	5.0' long x 20.0' 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
#3	Primary	273.50'	2.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.18 cfs @ 13.43 hrs HW=274.36' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.09 cfs @ 13.43 hrs HW=274.36' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **3=Orifice/Grate** (Orifice Controls 0.09 cfs @ 4.25 fps)

Summary for Pond B14: Basin #14

Inflow Area = 1.042 ac, 53.94% Impervious, Inflow Depth = 3.68" for 100-Yr Storm event
 Inflow = 4.26 cfs @ 12.11 hrs, Volume= 0.319 af
 Outflow = 0.33 cfs @ 13.69 hrs, Volume= 0.319 af, Atten= 92%, Lag= 95.2 min
 Discarded = 0.33 cfs @ 13.69 hrs, Volume= 0.319 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 274.69' @ 13.69 hrs Surf.Area= 5,947 sf Storage= 6,111 cf

Plug-Flow detention time= 187.0 min calculated for 0.319 af (100% of inflow)

Center-of-Mass det. time= 186.7 min (1,013.9 - 827.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	273.50'	15,076 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
273.50	4,528	279.4	0	0	4,528
274.00	4,954	288.8	2,370	2,370	4,976
275.00	6,429	397.9	5,676	8,045	10,948
276.00	7,651	416.8	7,031	15,076	12,239

Device	Routing	Invert	Outlet Devices							
#1	Discarded	273.50'	2.410 in/hr Exfiltration over Surface area							
#2	Primary	275.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.33 cfs @ 13.69 hrs HW=274.69' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=273.50' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B4: Basin #4

Inflow Area = 2.686 ac, 25.60% Impervious, Inflow Depth = 1.59" for 100-Yr Storm event
 Inflow = 3.27 cfs @ 12.23 hrs, Volume= 0.355 af
 Outflow = 0.34 cfs @ 15.16 hrs, Volume= 0.355 af, Atten= 90%, Lag= 175.9 min
 Discarded = 0.34 cfs @ 15.16 hrs, Volume= 0.355 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

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Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 273.80' @ 15.16 hrs Surf.Area= 6,035 sf Storage= 6,649 cf

Plug-Flow detention time= 231.6 min calculated for 0.355 af (100% of inflow)
 Center-of-Mass det. time= 231.4 min (1,120.2 - 888.8)

Volume	Invert	Avail.Storage	Storage Description
#1	272.50'	14,869 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.50	4,280	318.0	0	0	4,280
274.00	6,339	407.0	7,914	7,914	9,443
275.00	7,590	426.0	6,955	14,869	10,770

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	274.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.34 cfs @ 15.16 hrs HW=273.80' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

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

↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B5: Basin #5

Inflow Area = 1.310 ac, 41.58% Impervious, Inflow Depth = 2.78" for 100-Yr Storm event
 Inflow = 3.72 cfs @ 12.13 hrs, Volume= 0.303 af
 Outflow = 0.33 cfs @ 13.85 hrs, Volume= 0.303 af, Atten= 91%, Lag= 102.9 min
 Discarded = 0.33 cfs @ 13.85 hrs, Volume= 0.303 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.53' @ 13.85 hrs Surf.Area= 5,965 sf Storage= 5,596 cf

Plug-Flow detention time= 172.7 min calculated for 0.303 af (100% of inflow)
 Center-of-Mass det. time= 172.6 min (1,021.8 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1	271.50'	19,582 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.50	4,974	279.7	0	0	4,974
272.00	5,401	289.2	2,593	2,593	5,427
274.00	7,683	346.1	13,017	15,610	8,373
274.50	8,209	355.5	3,972	19,582	8,926

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.50'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.00'	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

Discarded OutFlow Max=0.33 cfs @ 13.85 hrs HW=272.53' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.50' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B6: Basin #6

[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 2.745 ac, 31.96% Impervious, Inflow Depth = 2.39" for 100-Yr Storm event
 Inflow = 6.22 cfs @ 12.16 hrs, Volume= 0.548 af
 Outflow = 2.50 cfs @ 12.52 hrs, Volume= 0.548 af, Atten= 60%, Lag= 21.5 min
 Discarded = 2.41 cfs @ 12.05 hrs, Volume= 0.542 af
 Primary = 0.09 cfs @ 12.52 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 269.82' @ 12.52 hrs Surf.Area= 3,600 sf Storage= 3,519 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)

Center-of-Mass det. time= 6.9 min (867.6 - 860.7)

Volume	Invert	Avail.Storage	Storage Description
#1	268.70'	8,348 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
268.70	2,694	252.1	0	0	2,694
270.00	3,755	283.2	4,173	4,173	4,064
271.00	4,611	297.2	4,176	8,348	4,772

Device	Routing	Invert	Outlet Devices
#1	Primary	269.00'	2.0" Vert. Orifice/Grate C= 0.600
#2	Discarded	268.70'	2.41 cfs Exfiltration at all elevations
#3	Primary	270.00'	5.0' long x 20.0' 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

Discarded OutFlow Max=2.41 cfs @ 12.05 hrs HW=268.77' (Free Discharge)

↑**2=Exfiltration** (Exfiltration Controls 2.41 cfs)

Primary OutFlow Max=0.09 cfs @ 12.52 hrs HW=269.82' (Free Discharge)

↑**1=Orifice/Grate** (Orifice Controls 0.09 cfs @ 4.13 fps)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B9: Basin #9

Inflow Area = 0.895 ac, 57.63% Impervious, Inflow Depth = 3.68" for 100-Yr Storm event
 Inflow = 3.78 cfs @ 12.09 hrs, Volume= 0.274 af
 Outflow = 0.61 cfs @ 12.60 hrs, Volume= 0.233 af, Atten= 84%, Lag= 30.6 min
 Discarded = 0.09 cfs @ 12.60 hrs, Volume= 0.121 af
 Primary = 0.53 cfs @ 12.60 hrs, Volume= 0.112 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 274.56' @ 12.60 hrs Surf.Area= 3,626 sf Storage= 5,303 cf

Plug-Flow detention time=258.4 min calculated for 0.233 af (85% of inflow)
 Center-of-Mass det. time= 194.1 min (1,020.3 - 826.1)

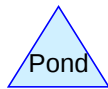
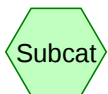
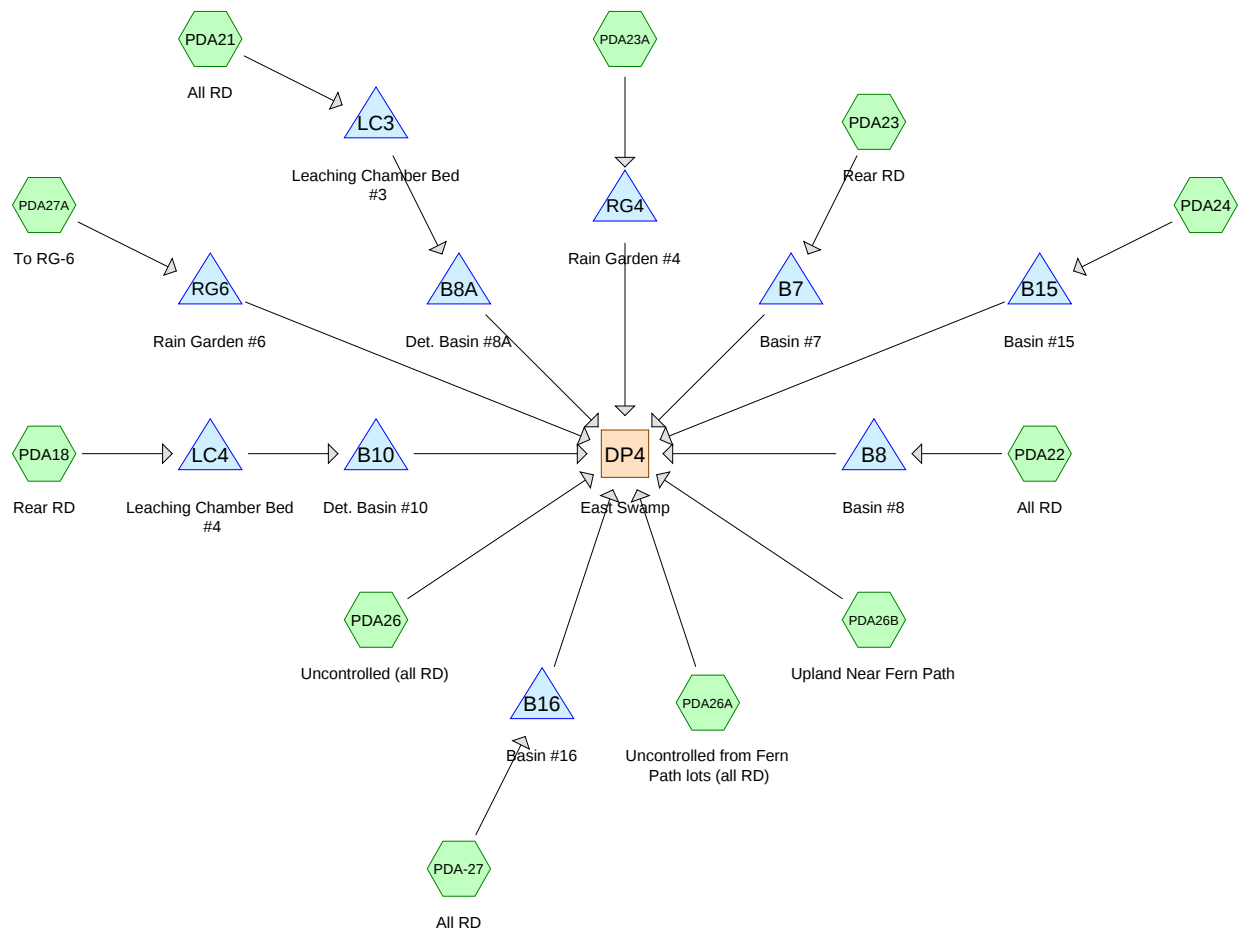
Volume	Invert	Avail.Storage	Storage Description
#1	272.70'	11,572 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
272.70	2,170	226.8	0	0	2,170
274.00	3,103	251.4	3,409	3,409	3,156
276.00	5,145	299.9	8,162	11,572	5,354

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.70'	1.020 in/hr Exfiltration over Surface area
#2	Primary	274.00'	4.0" Vert. Orifice/Grate X 2.00 C= 0.600
#3	Primary	275.00'	5.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Discarded OutFlow Max=0.09 cfs @ 12.60 hrs HW=274.56' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=0.53 cfs @ 12.60 hrs HW=274.56' (Free Discharge)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.53 cfs @ 3.03 fps)
 ↑ **3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)



Routing Diagram for OE2765-POST-EAST-7.11.17
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.037	39	>75% Grass cover, Good, HSG A (PDA18, PDA21, PDA22, PDA23, PDA23A, PDA24, PDA26)
1.543	74	>75% Grass cover, Good, HSG C (PDA-27, PDA26, PDA26A, PDA27A)
0.154	80	>75% Grass cover, Good, HSG D (PDA22, PDA26)
0.063	98	Pavement, HSG A (PDA24)
0.279	98	Unconnected roofs, HSG A (PDA18, PDA23)
3.052	30	Woods, Good, HSG A (PDA23A, PDA24, PDA26)
3.874	70	Woods, Good, HSG C (PDA26, PDA26A, PDA26B)
1.120	77	Woods, Good, HSG D (PDA26, PDA26A, PDA26B)
0.103	98	lots 129 and 130 long drives (PDA26)
2.335	98	roads, sidewalks, drives, HSG A (PDA18, PDA21, PDA22, PDA23)
0.112	98	roads, sidewalks, drives, HSG C (PDA-27)
0.048	98	roads, sidewalks, drives, HSG D (PDA22)
19.720	58	TOTAL AREA

Summary for Subcatchment PDA-27: All RD

Runoff = 0.68 cfs @ 12.10 hrs, Volume= 0.050 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	4,896	98	roads, sidewalks, drives, HSG C
	12,884	74	>75% Grass cover, Good, HSG C
	17,780	81	Weighted Average
	12,884		72.46% Pervious Area
	4,896		27.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.3	35	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
6.1	115	Total			

Summary for Subcatchment PDA18: Rear RD

Runoff = 0.67 cfs @ 12.13 hrs, Volume= 0.061 af, Depth= 0.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	17,400	98	roads, sidewalks, drives, HSG A
	4,031	98	Unconnected roofs, HSG A
	21,805	39	>75% Grass cover, Good, HSG A
	43,236	68	Weighted Average
	21,805		50.43% Pervious Area
	21,431		49.57% Impervious Area
	4,031		18.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
2.2	272	0.0100	2.03		Shallow Concentrated Flow, bc
					Paved Kv= 20.3 fps
7.8	322	Total			

Summary for Subcatchment PDA21: All RD

Runoff = 0.66 cfs @ 12.13 hrs, Volume= 0.065 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	24,780	98	roads, sidewalks, drives, HSG A
	31,545	39	>75% Grass cover, Good, HSG A
	56,325	65	Weighted Average
	31,545		56.01% Pervious Area
	24,780		43.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
0.4	53	0.0200	2.28		Shallow Concentrated Flow, bc
					Unpaved Kv= 16.1 fps
1.3	157	0.0100	2.03		Shallow Concentrated Flow, cd
					Paved Kv= 20.3 fps
7.3	260	Total			

Summary for Subcatchment PDA22: All RD

Runoff = 0.97 cfs @ 12.15 hrs, Volume= 0.098 af, Depth= 0.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	33,941	98	roads, sidewalks, drives, HSG A
*	2,107	98	roads, sidewalks, drives, HSG D
	47,815	39	>75% Grass cover, Good, HSG A
	1,327	80	>75% Grass cover, Good, HSG D
	85,190	65	Weighted Average
	49,142		57.69% Pervious Area
	36,048		42.31% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.2	26	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
1.6	235	0.0150	2.49		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.9	225	0.0080	4.06	3.19	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.3	536	Total			

Summary for Subcatchment PDA23: Rear RD

Runoff = 1.25 cfs @ 12.10 hrs, Volume= 0.101 af, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	25,591	98	roads, sidewalks, drives, HSG A
	29,781	39	>75% Grass cover, Good, HSG A
	8,116	98	Unconnected roofs, HSG A
	63,488	70	Weighted Average
	29,781		46.91% Pervious Area
	33,707		53.09% Impervious Area
	8,116		24.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA23A:

[45] Hint: Runoff=Zero

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
	12,450	39	>75% Grass cover, Good, HSG A
	16,250	30	Woods, Good, HSG A
	28,700	34	Weighted Average
	28,700		100.00% Pervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, ab
					Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	70	0.0900	4.83		Shallow Concentrated Flow, bc
					Unpaved Kv= 16.1 fps
7.7	120	Total			

Summary for Subcatchment PDA24:

Runoff = 0.00 cfs @ 15.69 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	2,724	98	Pavement, HSG A
	19,674	39	>75% Grass cover, Good, HSG A
	3,110	30	Woods, Good, HSG A
	25,508	44	Weighted Average
	22,784		89.32% Pervious Area
	2,724		10.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA26: Uncontrolled (all RD)

Runoff = 0.04 cfs @ 15.43 hrs, Volume= 0.029 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
	33,333	74	>75% Grass cover, Good, HSG C
	143,474	39	>75% Grass cover, Good, HSG A
	113,573	30	Woods, Good, HSG A
	5,366	80	>75% Grass cover, Good, HSG D
	19,695	77	Woods, Good, HSG D
	25,769	70	Woods, Good, HSG C
*	4,500	98	lots 129 and 130 long drives
	345,710	45	Weighted Average
	341,210		98.70% Pervious Area
	4,500		1.30% Impervious Area

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	450	0.0150	1.97		Shallow Concentrated Flow, b Unpaved Kv= 16.1 fps
10.9	500	Total			

Summary for Subcatchment PDA26A: Uncontrolled from Fern Path lots (all RD)

Runoff = 1.24 cfs @ 12.43 hrs, Volume= 0.163 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
13,183	74	>75% Grass cover, Good, HSG C
66,432	70	Woods, Good, HSG C
12,190	77	Woods, Good, HSG D
91,805	72	Weighted Average
91,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	225	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
27.5	275	Total			

Summary for Subcatchment PDA26B: Upland Near Fern Path

Runoff = 1.45 cfs @ 12.25 hrs, Volume= 0.157 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
76,546	70	Woods, Good, HSG C
16,894	77	Woods, Good, HSG D
93,440	71	Weighted Average
93,440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	120	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
16.3	170	Total			

Summary for Subcatchment PDA27A: To RG-6

[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.21 cfs @ 12.08 hrs, Volume= 0.015 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, $dt=0.05$ hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

Area (sf)	CN	Description
7,800	74	>75% Grass cover, Good, HSG C
7,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		Sheet Flow,
					Grass: Short $n=0.150$ $P2=3.20"$
0.9	90	0.0100	1.61		Shallow Concentrated Flow,
					Unpaved $K_v=16.1$ fps
4.5	140	Total			

Summary for Reach DP4: East Swamp

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

Inflow Area = 19.720 ac, 14.91% Impervious, Inflow Depth = 0.24" for 2-Yr Storm event
Inflow = 2.54 cfs @ 12.33 hrs, Volume= 0.387 af
Outflow = 2.54 cfs @ 12.33 hrs, Volume= 0.387 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, $dt=0.05$ hrs

Summary for Pond B10: Det. Basin #10

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 0.46" for 2-Yr Storm event
Inflow = 0.49 cfs @ 12.26 hrs, Volume= 0.038 af
Outflow = 0.08 cfs @ 13.52 hrs, Volume= 0.038 af, Atten= 85%, Lag= 75.7 min
Primary = 0.08 cfs @ 13.52 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, $dt=0.05$ hrs
Peak Elev= 270.10' @ 13.52 hrs Surf.Area= 1,436 sf Storage= 568 cf

Plug-Flow detention time= 96.6 min calculated for 0.038 af (100% of inflow)
Center-of-Mass det. time= 96.4 min (951.9 - 855.6)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.50	415	97.0	0	0	415
270.00	1,380	210.0	425	425	3,177
272.00	2,683	235.0	3,991	4,417	4,168
274.00	4,100	269.0	6,733	11,150	5,621

Device	Routing	Invert	Outlet Devices
#1	Primary	269.50'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Primary OutFlow Max=0.08 cfs @ 13.52 hrs HW=270.10' (Free Discharge)↑ **1=Orifice/Grate** (Orifice Controls 0.08 cfs @ 3.47 fps)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B15: Basin #15**

Inflow Area = 0.586 ac, 10.68% Impervious, Inflow Depth = 0.03" for 2-Yr Storm event
 Inflow = 0.00 cfs @ 15.69 hrs, Volume= 0.002 af
 Outflow = 0.00 cfs @ 15.90 hrs, Volume= 0.002 af, Atten= 1%, Lag= 12.3 min
 Discarded = 0.00 cfs @ 15.90 hrs, Volume= 0.002 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 264.00' @ 15.90 hrs Surf.Area= 531 sf Storage= 2 cf

Plug-Flow detention time= 11.7 min calculated for 0.002 af (100% of inflow)

Center-of-Mass det. time= 11.8 min (1,147.7 - 1,135.9)

Volume	Invert	Avail.Storage	Storage Description
#1	264.00'	7,324 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.00	530	103.9	0	0	530
266.00	1,761	191.4	2,171	2,171	2,607
268.00	3,489	301.2	5,152	7,324	6,940

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	266.00'	12.0" Round Emergency Overflow Culvert L= 58.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 266.00' / 265.42' S= 0.0100' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 15.90 hrs HW=264.00' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=264.00' (Free Discharge)↑ **2=Emergency Overflow Culvert** (Controls 0.00 cfs)

Summary for Pond B16: Basin #16

Inflow Area = 0.408 ac, 27.54% Impervious, Inflow Depth = 1.47" for 2-Yr Storm event
 Inflow = 0.68 cfs @ 12.10 hrs, Volume= 0.050 af
 Outflow = 0.16 cfs @ 12.52 hrs, Volume= 0.050 af, Atten= 76%, Lag= 25.3 min
 Discarded = 0.16 cfs @ 12.52 hrs, Volume= 0.050 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.79' @ 12.52 hrs Surf.Area= 859 sf Storage= 556 cf

Plug-Flow detention time=23.6 min calculated for 0.050 af (100% of inflow)
 Center-of-Mass det. time= 23.6 min (863.2 - 839.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	271.00'	3,193 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	555	117.4	0	0	555
272.00	949	139.3	743	743	1,020
273.50	2,431	218.3	2,449	3,193	3,284

Device	Routing	Invert	Outlet Devices											
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area											
#2	Primary	272.25'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	
				2.50	3.00	3.50	4.00	4.50	5.00	5.50				
			Coef. (English)	2.34	2.50	2.70	2.68	2.68	2.66	2.65	2.65	2.65		
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88			

Discarded OutFlow Max=0.16 cfs @ 12.52 hrs HW=271.79' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B7: Basin #7

Inflow Area = 1.457 ac, 53.09% Impervious, Inflow Depth = 0.83" for 2-Yr Storm event
 Inflow = 1.25 cfs @ 12.10 hrs, Volume= 0.101 af
 Outflow = 0.19 cfs @ 12.88 hrs, Volume= 0.101 af, Atten= 84%, Lag= 46.7 min
 Discarded = 0.19 cfs @ 12.88 hrs, Volume= 0.101 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 261.39' @ 12.88 hrs Surf.Area= 3,492 sf Storage= 1,295 cf

Plug-Flow detention time=57.8 min calculated for 0.101 af (100% of inflow)
 Center-of-Mass det. time= 57.6 min (933.3 - 875.7)

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Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	15,989 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
261.00	3,170	255.0	0	0	3,170
262.00	4,030	275.0	3,591	3,591	4,054
264.00	6,476	335.0	10,410	14,001	7,030
264.30	6,777	338.0	1,988	15,989	7,220

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	263.30'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.19 cfs @ 12.88 hrs HW=261.39' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.19 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=261.00' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B8: Basin #8**

Inflow Area = 1.956 ac, 42.31% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
 Inflow = 0.97 cfs @ 12.15 hrs, Volume= 0.098 af
 Outflow = 0.24 cfs @ 12.73 hrs, Volume= 0.098 af, Atten= 76%, Lag= 35.0 min
 Discarded = 0.24 cfs @ 12.73 hrs, Volume= 0.098 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 265.46' @ 12.73 hrs Surf.Area= 1,230 sf Storage= 972 cf

Plug-Flow detention time= 33.3 min calculated for 0.098 af (100% of inflow)
 Center-of-Mass det. time= 33.3 min (930.8 - 897.5)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,534 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.50	818	176.0	0	0	818
266.00	1,502	197.8	1,714	1,714	1,524
268.30	2,752	231.2	4,820	6,534	2,767

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	265.75'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.50'	2.0' long x 1.80' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.5' Crest Height

Discarded OutFlow Max=0.24 cfs @ 12.73 hrs HW=265.46' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=264.50' (Free Discharge)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

↑ **3=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 0.00" for 2-Yr Storm event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 270.20' @ 0.00 hrs Surf.Area= 50 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,568 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.20	50	50.0	0	0	50
271.00	364	272.0	146	146	5,740
272.00	1,189	287.0	737	883	6,463
274.00	2,585	313.0	3,685	4,568	7,842

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.0' Crest Height
#2	Primary	270.25'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=270.20' (Free Discharge)

↑ **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

↑ **2=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
 Inflow = 0.66 cfs @ 12.13 hrs, Volume= 0.065 af
 Outflow = 0.11 cfs @ 12.05 hrs, Volume= 0.065 af, Atten= 83%, Lag= 0.0 min
 Discarded = 0.11 cfs @ 12.05 hrs, Volume= 0.065 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

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Type III 24-hr 2-Yr Storm Rainfall=3.20"

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Peak Elev= 271.90' @ 13.15 hrs Surf.Area= 0.045 ac Storage= 0.018 af

Plug-Flow detention time= 63.0 min calculated for 0.065 af (100% of inflow)

Center-of-Mass det. time= 62.8 min (959.4 - 896.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.030 af	11.33'W x 172.00'L x 2.71'H Field A 0.121 af Overall - 0.047 af Embedded = 0.074 af x 40.0% Voids
#2A	271.40'	0.047 af	Cultec R-280HD x 48 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		0.077 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.30'	6.0" Round Culvert X 4.00 L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.30' / 273.20' S= 0.0100 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 12.05 hrs HW=271.45' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=271.40' (Free Discharge)↑**2=Culvert** (Controls 0.00 cfs)**Summary for Pond LC4: Leaching Chamber Bed #4**

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 0.73" for 2-Yr Storm event
Inflow = 0.67 cfs @ 12.13 hrs, Volume= 0.061 af
Outflow = 0.50 cfs @ 12.26 hrs, Volume= 0.059 af, Atten= 24%, Lag= 7.4 min
Discarded = 0.01 cfs @ 11.80 hrs, Volume= 0.021 af
Primary = 0.49 cfs @ 12.26 hrs, Volume= 0.038 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 271.62' @ 12.26 hrs Surf.Area= 0.013 ac Storage= 0.010 af

Plug-Flow detention time= 126.1 min calculated for 0.059 af (97% of inflow)

Center-of-Mass det. time= 111.7 min (996.5 - 884.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.50'	0.008 af	16.50'W x 35.50'L x 2.04'H Field A 0.027 af Overall - 0.008 af Embedded = 0.020 af x 40.0% Voids
#2A	270.50'	0.008 af	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		0.016 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	271.40'	8.0" Round Culvert X 3.00 L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.01 cfs @ 11.80 hrs HW=270.53' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.48 cfs @ 12.26 hrs HW=271.62' (Free Discharge)

↑**2=Culvert** (Inlet Controls 0.48 cfs @ 1.60 fps)

Summary for Pond RG4: Rain Garden #4

Inflow Area = 0.659 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Yr Storm event
 Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 265.00' @ 0.00 hrs Surf.Area= 164 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

Volume	Invert	Avail.Storage	Storage Description			
#1	265.00'	334 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
265.00	164	114.0	0	0	164	
266.00	541	134.9	334	334	596	

Device	Routing	Invert	Outlet Devices
#1	Discarded	265.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.75'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.00 cfs @ 0.00 hrs HW=265.00' (Free Discharge)

↑**1=Exfiltration** (Passes 0.00 cfs of 0.01 cfs potential flow)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=265.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RG6: Rain Garden #6

Inflow Area = 0.179 ac, 0.00% Impervious, Inflow Depth = 1.04" for 2-Yr Storm event
 Inflow = 0.21 cfs @ 12.08 hrs, Volume= 0.015 af
 Outflow = 0.18 cfs @ 12.12 hrs, Volume= 0.015 af, Atten= 14%, Lag= 2.7 min
 Discarded = 0.18 cfs @ 12.12 hrs, Volume= 0.015 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.01' @ 12.12 hrs Surf.Area= 942 sf Storage= 12 cf

Plug-Flow detention time=0.7 min calculated for 0.015 af (100% of inflow)
 Center-of-Mass det. time=0.7 min (861.3 - 860.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	271.00'	751 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	937	118.0	0	0	937
271.70	1,215	131.0	751	751	1,209

Device	Routing	Invert	Outlet Devices												
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area												
#2	Primary	271.50'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir												
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00												
			2.50 3.00 3.50 4.00 4.50												
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68												
			2.72 2.81 2.92 2.97 3.07 3.32												

Discarded OutFlow Max=0.18 cfs @ 12.12 hrs HW=271.01' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment PDA-27: All RD

Runoff = 1.27 cfs @ 12.09 hrs, Volume= 0.093 af, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	4,896	98	roads, sidewalks, drives, HSG C
	12,884	74	>75% Grass cover, Good, HSG C
	17,780	81	Weighted Average
	12,884		72.46% Pervious Area
	4,896		27.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.3	35	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
6.1	115	Total			

Summary for Subcatchment PDA18: Rear RD

Runoff = 1.73 cfs @ 12.12 hrs, Volume= 0.138 af, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	17,400	98	roads, sidewalks, drives, HSG A
	4,031	98	Unconnected roofs, HSG A
	21,805	39	>75% Grass cover, Good, HSG A
	43,236	68	Weighted Average
	21,805		50.43% Pervious Area
	21,431		49.57% Impervious Area
	4,031		18.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
2.2	272	0.0100	2.03		Shallow Concentrated Flow, bc
					Paved Kv= 20.3 fps
7.8	322	Total			

Summary for Subcatchment PDA21: All RD

Runoff = 1.95 cfs @ 12.12 hrs, Volume= 0.157 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	24,780	98	roads, sidewalks, drives, HSG A
	31,545	39	>75% Grass cover, Good, HSG A
	56,325	65	Weighted Average
	31,545		56.01% Pervious Area
	24,780		43.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
0.4	53	0.0200	2.28		Shallow Concentrated Flow, bc
					Unpaved Kv= 16.1 fps
1.3	157	0.0100	2.03		Shallow Concentrated Flow, cd
					Paved Kv= 20.3 fps
7.3	260	Total			

Summary for Subcatchment PDA22: All RD

Runoff = 2.82 cfs @ 12.13 hrs, Volume= 0.237 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	33,941	98	roads, sidewalks, drives, HSG A
*	2,107	98	roads, sidewalks, drives, HSG D
	47,815	39	>75% Grass cover, Good, HSG A
	1,327	80	>75% Grass cover, Good, HSG D
	85,190	65	Weighted Average
	49,142		57.69% Pervious Area
	36,048		42.31% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.2	26	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
1.6	235	0.0150	2.49		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.9	225	0.0080	4.06	3.19	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.3	536	Total			

Summary for Subcatchment PDA23: Rear RD

Runoff = 2.98 cfs @ 12.10 hrs, Volume= 0.221 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	25,591	98	roads, sidewalks, drives, HSG A
	29,781	39	>75% Grass cover, Good, HSG A
	8,116	98	Unconnected roofs, HSG A
	63,488	70	Weighted Average
	29,781		46.91% Pervious Area
	33,707		53.09% Impervious Area
	8,116		24.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA23A:

Runoff = 0.00 cfs @ 17.15 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
	12,450	39	>75% Grass cover, Good, HSG A
	16,250	30	Woods, Good, HSG A
	28,700	34	Weighted Average
	28,700		100.00% Pervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	70	0.0900	4.83		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
7.7	120	Total			

Summary for Subcatchment PDA24:

Runoff = 0.07 cfs @ 12.37 hrs, Volume= 0.015 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
* 2,724	98	Pavement, HSG A
19,674	39	>75% Grass cover, Good, HSG A
3,110	30	Woods, Good, HSG A
25,508	44	Weighted Average
22,784		89.32% Pervious Area
2,724		10.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA26: Uncontrolled (all RD)

Runoff = 1.06 cfs @ 12.42 hrs, Volume= 0.232 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
33,333	74	>75% Grass cover, Good, HSG C
143,474	39	>75% Grass cover, Good, HSG A
113,573	30	Woods, Good, HSG A
5,366	80	>75% Grass cover, Good, HSG D
19,695	77	Woods, Good, HSG D
25,769	70	Woods, Good, HSG C
* 4,500	98	lots 129 and 130 long drives
345,710	45	Weighted Average
341,210		98.70% Pervious Area
4,500		1.30% Impervious Area

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	450	0.0150	1.97		Shallow Concentrated Flow, b Unpaved Kv= 16.1 fps
10.9	500	Total			

Summary for Subcatchment PDA26A: Uncontrolled from Fern Path lots (all RD)

Runoff = 2.81 cfs @ 12.40 hrs, Volume= 0.346 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
13,183	74	>75% Grass cover, Good, HSG C
66,432	70	Woods, Good, HSG C
12,190	77	Woods, Good, HSG D
91,805	72	Weighted Average
91,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	225	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
27.5	275	Total			

Summary for Subcatchment PDA26B: Upland Near Fern Path

Runoff = 3.38 cfs @ 12.24 hrs, Volume= 0.338 af, Depth= 1.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
76,546	70	Woods, Good, HSG C
16,894	77	Woods, Good, HSG D
93,440	71	Weighted Average
93,440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	120	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
16.3	170	Total			

Summary for Subcatchment PDA27A: To RG-6

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

Runoff = 0.45 cfs @ 12.07 hrs, Volume= 0.032 af, Depth= 2.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

Area (sf)	CN	Description
7,800	74	>75% Grass cover, Good, HSG C
7,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.20"
0.9	90	0.0100	1.61		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
4.5	140	Total			

Summary for Reach DP4: East Swamp

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

Inflow Area = 19.720 ac, 14.91% Impervious, Inflow Depth = 0.68" for 10-Yr Storm event
 Inflow = 7.65 cfs @ 12.34 hrs, Volume= 1.111 af
 Outflow = 7.65 cfs @ 12.34 hrs, Volume= 1.111 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond B10: Det. Basin #10

[79] Warning: Submerged Pond LC4 Primary device # 2 OUTLET by 0.26'

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 1.38" for 10-Yr Storm event
 Inflow = 1.66 cfs @ 12.14 hrs, Volume= 0.114 af
 Outflow = 0.13 cfs @ 14.10 hrs, Volume= 0.114 af, Atten= 92%, Lag= 118.0 min
 Primary = 0.13 cfs @ 14.10 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.16' @ 14.10 hrs Surf.Area= 2,083 sf Storage= 2,418 cf

Plug-Flow detention time=226.9 min calculated for 0.114 af (100% of inflow)
 Center-of-Mass det. time= 226.6 min (1,074.3 - 847.8)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.50	415	97.0	0	0	415
270.00	1,380	210.0	425	425	3,177
272.00	2,683	235.0	3,991	4,417	4,168
274.00	4,100	269.0	6,733	11,150	5,621

Device	Routing	Invert	Outlet Devices
#1	Primary	269.50'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Primary OutFlow Max=0.13 cfs @ 14.10 hrs HW=271.16' (Free Discharge)↑**1=Orifice/Grate** (Orifice Controls 0.13 cfs @ 6.04 fps)↑**2=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B15: Basin #15**

Inflow Area = 0.586 ac, 10.68% Impervious, Inflow Depth = 0.31" for 10-Yr Storm event
 Inflow = 0.07 cfs @ 12.37 hrs, Volume= 0.015 af
 Outflow = 0.03 cfs @ 12.92 hrs, Volume= 0.015 af, Atten= 52%, Lag= 33.1 min
 Discarded = 0.03 cfs @ 12.92 hrs, Volume= 0.015 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 264.09' @ 12.92 hrs Surf.Area= 571 sf Storage= 51 cf

Plug-Flow detention time= 15.3 min calculated for 0.015 af (100% of inflow)

Center-of-Mass det. time= 15.4 min (983.7 - 968.3)

Volume	Invert	Avail.Storage	Storage Description
#1	264.00'	7,324 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.00	530	103.9	0	0	530
266.00	1,761	191.4	2,171	2,171	2,607
268.00	3,489	301.2	5,152	7,324	6,940

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	266.00'	12.0" Round Emergency Overflow Culvert L= 58.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 266.00' / 265.42' S= 0.0100' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.03 cfs @ 12.92 hrs HW=264.09' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.03 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=264.00' (Free Discharge)↑**2=Emergency Overflow Culvert**(Controls 0.00 cfs)

Summary for Pond B16: Basin #16

Inflow Area = 0.408 ac, 27.54% Impervious, Inflow Depth = 2.72" for 10-Yr Storm event
 Inflow = 1.27 cfs @ 12.09 hrs, Volume= 0.093 af
 Outflow = 0.50 cfs @ 12.36 hrs, Volume= 0.093 af, Atten= 61%, Lag= 16.0 min
 Discarded = 0.23 cfs @ 12.36 hrs, Volume= 0.087 af
 Primary = 0.27 cfs @ 12.36 hrs, Volume= 0.006 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.33' @ 12.36 hrs Surf.Area= 1,217 sf Storage= 1,100 cf

Plug-Flow detention time=37.0 min calculated for 0.092 af (100% of inflow)
 Center-of-Mass det. time= 36.9 min (858.7 - 821.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	271.00'	3,193 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	555	117.4	0	0	555
272.00	949	139.3	743	743	1,020
273.50	2,431	218.3	2,449	3,193	3,284

Device	Routing	Invert	Outlet Devices											
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area											
#2	Primary	272.25'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	
				2.50	3.00	3.50	4.00	4.50	5.00	5.50				
			Coef. (English)	2.34	2.50	2.70	2.68	2.68	2.66	2.66	2.65	2.65	2.65	
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88			

Discarded OutFlow Max=0.23 cfs @ 12.36 hrs HW=272.33' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.23 cfs)

Primary OutFlow Max=0.26 cfs @ 12.36 hrs HW=272.33' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.66 fps)

Summary for Pond B7: Basin #7

Inflow Area = 1.457 ac, 53.09% Impervious, Inflow Depth = 1.82" for 10-Yr Storm event
 Inflow = 2.98 cfs @ 12.10 hrs, Volume= 0.221 af
 Outflow = 0.23 cfs @ 13.96 hrs, Volume= 0.221 af, Atten= 92%, Lag= 111.5 min
 Discarded = 0.23 cfs @ 13.96 hrs, Volume= 0.221 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.14' @ 13.96 hrs Surf.Area= 4,184 sf Storage= 4,172 cf

Plug-Flow detention time=192.7 min calculated for 0.220 af (100% of inflow)
 Center-of-Mass det. time= 192.4 min (1,043.5 - 851.1)

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	15,989 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
261.00	3,170	255.0	0	0	3,170
262.00	4,030	275.0	3,591	3,591	4,054
264.00	6,476	335.0	10,410	14,001	7,030
264.30	6,777	338.0	1,988	15,989	7,220

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	263.30'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.23 cfs @ 13.96 hrs HW=262.14' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.23 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=261.00' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B8: Basin #8**

Inflow Area = 1.956 ac, 42.31% Impervious, Inflow Depth = 1.46" for 10-Yr Storm event
 Inflow = 2.82 cfs @ 12.13 hrs, Volume= 0.237 af
 Outflow = 1.12 cfs @ 12.48 hrs, Volume= 0.237 af, Atten= 60%, Lag= 20.8 min
 Discarded = 0.34 cfs @ 12.48 hrs, Volume= 0.181 af
 Primary = 0.78 cfs @ 12.48 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 266.55' @ 12.48 hrs Surf.Area= 1,768 sf Storage= 2,616 cf

Plug-Flow detention time=48.6 min calculated for 0.237 af (100% of inflow)
 Center-of-Mass det. time= 48.5 min (915.5 - 866.9)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,534 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.50	818	176.0	0	0	818
266.00	1,502	197.8	1,714	1,714	1,524
268.30	2,752	231.2	4,820	6,534	2,767

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	265.75'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.50'	2.0' long x 1.80' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.5' Crest Height

Discarded OutFlow Max=0.34 cfs @ 12.48 hrs HW=266.55' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.77 cfs @ 12.48 hrs HW=266.55' (Free Discharge)

↑ **2=Orifice/Grate** (Orifice Controls 0.70 cfs @ 3.57 fps)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.73 fps)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 0.17" for 10-Yr Storm event
 Inflow = 0.15 cfs @ 13.02 hrs, Volume= 0.018 af
 Outflow = 0.15 cfs @ 13.09 hrs, Volume= 0.018 af, Atten= 3%, Lag= 4.1 min
 Primary = 0.15 cfs @ 13.09 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 270.54' @ 13.09 hrs Surf.Area= 149 sf Storage= 33 cf

Plug-Flow detention time=4.4 min calculated for 0.018 af (99% of inflow)

Center-of-Mass det. time= 4.0 min (833.1 - 829.1)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,568 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.20	50	50.0	0	0	50
271.00	364	272.0	146	146	5,740
272.00	1,189	287.0	737	883	6,463
274.00	2,585	313.0	3,685	4,568	7,842

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.0' Crest Height
#2	Primary	270.25'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.15 cfs @ 13.09 hrs HW=270.54' (Free Discharge)

↑ **1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 1.84 fps)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 1.46" for 10-Yr Storm event
 Inflow = 1.95 cfs @ 12.12 hrs, Volume= 0.157 af
 Outflow = 0.26 cfs @ 13.02 hrs, Volume= 0.157 af, Atten= 87%, Lag= 54.1 min
 Discarded = 0.11 cfs @ 11.75 hrs, Volume= 0.139 af
 Primary = 0.15 cfs @ 13.02 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

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Type III 24-hr 10-Yr Storm Rainfall=4.70"

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Peak Elev= 273.42' @ 13.02 hrs Surf.Area= 0.045 ac Storage= 0.064 af

Plug-Flow detention time=250.4 min calculated for 0.157 af (100% of inflow)

Center-of-Mass det. time= 250.4 min (1,116.4 - 866.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.030 af	11.33'W x 172.00'L x 2.71'H Field A 0.121 af Overall - 0.047 af Embedded = 0.074 af x 40.0% Voids
#2A	271.40'	0.047 af	Cultec R-280HD x 48 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		0.077 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.30'	6.0" Round Culvert X 4.00 L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.30' / 273.20' S= 0.0100 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.75 hrs HW=271.44' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)**Primary OutFlow** Max=0.15 cfs @ 13.02 hrs HW=273.42' (Free Discharge)↑**2=Culvert** (Barrel Controls 0.15 cfs @ 1.61 fps)**Summary for Pond LC4: Leaching Chamber Bed #4**

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 1.67" for 10-Yr Storm event
Inflow = 1.73 cfs @ 12.12 hrs, Volume= 0.138 af
Outflow = 1.67 cfs @ 12.14 hrs, Volume= 0.136 af, Atten= 3%, Lag= 1.1 min
Discarded = 0.01 cfs @ 10.90 hrs, Volume= 0.022 af
Primary = 1.66 cfs @ 12.14 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 271.84' @ 12.14 hrs Surf.Area= 0.013 ac Storage= 0.012 af

Plug-Flow detention time=57.0 min calculated for 0.136 af (99% of inflow)

Center-of-Mass det. time= 50.2 min (908.3 - 858.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.50'	0.008 af	16.50'W x 35.50'L x 2.04'H Field A 0.027 af Overall - 0.008 af Embedded = 0.020 af x 40.0% Voids
#2A	270.50'	0.008 af	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		0.016 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	271.40'	8.0" Round Culvert X 3.00 L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.01 cfs @ 10.90 hrs HW=270.52' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.63 cfs @ 12.14 hrs HW=271.84' (Free Discharge)

↑**2=Culvert** (Inlet Controls 1.63 cfs @ 2.25 fps)

Summary for Pond RG4: Rain Garden #4

Inflow Area = 0.659 ac, 0.00% Impervious, Inflow Depth = 0.03" for 10-Yr Storm event
 Inflow = 0.00 cfs @ 17.15 hrs, Volume= 0.002 af
 Outflow = 0.00 cfs @ 17.20 hrs, Volume= 0.002 af, Atten= 0%, Lag= 3.0 min
 Discarded = 0.00 cfs @ 17.20 hrs, Volume= 0.002 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 265.00' @ 17.20 hrs Surf.Area= 165 sf Storage= 0 cf

Plug-Flow detention time=3.0 min calculated for 0.002 af (100% of inflow)

Center-of-Mass det. time= 3.0 min (1,171.9 - 1,168.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	265.00'	334 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
265.00	164	114.0	0	0	164	
266.00	541	134.9	334	334	596	

Device	Routing	Invert	Outlet Devices
#1	Discarded	265.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.75'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.01 cfs @ 17.20 hrs HW=265.00' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=265.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RG6: Rain Garden #6

Inflow Area = 0.179 ac, 0.00% Impervious, Inflow Depth = 2.13" for 10-Yr Storm event
 Inflow = 0.45 cfs @ 12.07 hrs, Volume= 0.032 af
 Outflow = 0.19 cfs @ 12.30 hrs, Volume= 0.032 af, Atten= 58%, Lag= 13.8 min
 Discarded = 0.19 cfs @ 12.30 hrs, Volume= 0.032 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.16' @ 12.30 hrs Surf.Area= 998 sf Storage= 156 cf

Plug-Flow detention time=(not calculated: outflow precedes inflow)
 Center-of-Mass det. time= 3.9 min (843.1 - 839.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	271.00'	751 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	937	118.0	0	0	937
271.70	1,215	131.0	751	751	1,209

Device	Routing	Invert	Outlet Devices											
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area											
#2	Primary	271.50'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir											
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	
				2.50	3.00	3.50	4.00	4.50						
			Coef. (English)	2.44	2.58	2.68	2.67	2.65	2.64	2.64	2.68	2.68		
				2.72	2.81	2.92	2.97	3.07	3.32					

Discarded OutFlow Max=0.19 cfs @ 12.30 hrs HW=271.16' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment PDA-27: All RD

Runoff = 1.60 cfs @ 12.09 hrs, Volume= 0.117 af, Depth= 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	4,896	98	roads, sidewalks, drives, HSG C
	12,884	74	>75% Grass cover, Good, HSG C
	17,780	81	Weighted Average
	12,884		72.46% Pervious Area
	4,896		27.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.3	35	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
6.1	115	Total			

Summary for Subcatchment PDA18: Rear RD

Runoff = 2.38 cfs @ 12.12 hrs, Volume= 0.186 af, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	17,400	98	roads, sidewalks, drives, HSG A
	4,031	98	Unconnected roofs, HSG A
	21,805	39	>75% Grass cover, Good, HSG A
	43,236	68	Weighted Average
	21,805		50.43% Pervious Area
	21,431		49.57% Impervious Area
	4,031		18.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
2.2	272	0.0100	2.03		Shallow Concentrated Flow, bc
					Paved Kv= 20.3 fps
7.8	322	Total			

Summary for Subcatchment PDA21: All RD

Runoff = 2.76 cfs @ 12.11 hrs, Volume= 0.215 af, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	24,780	98	roads, sidewalks, drives, HSG A
	31,545	39	>75% Grass cover, Good, HSG A
	56,325	65	Weighted Average
	31,545		56.01% Pervious Area
	24,780		43.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
0.4	53	0.0200	2.28		Shallow Concentrated Flow, bc
					Unpaved Kv= 16.1 fps
1.3	157	0.0100	2.03		Shallow Concentrated Flow, cd
					Paved Kv= 20.3 fps
7.3	260	Total			

Summary for Subcatchment PDA22: All RD

Runoff = 3.98 cfs @ 12.13 hrs, Volume= 0.325 af, Depth= 1.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	33,941	98	roads, sidewalks, drives, HSG A
*	2,107	98	roads, sidewalks, drives, HSG D
	47,815	39	>75% Grass cover, Good, HSG A
	1,327	80	>75% Grass cover, Good, HSG D
	85,190	65	Weighted Average
	49,142		57.69% Pervious Area
	36,048		42.31% Impervious Area

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Type III 24-hr 25-yr Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.2	26	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
1.6	235	0.0150	2.49		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.9	225	0.0080	4.06	3.19	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.3	536	Total			

Summary for Subcatchment PDA23: Rear RD

Runoff = 4.01 cfs @ 12.10 hrs, Volume= 0.293 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	25,591	98	roads, sidewalks, drives, HSG A
	29,781	39	>75% Grass cover, Good, HSG A
	8,116	98	Unconnected roofs, HSG A
	63,488	70	Weighted Average
	29,781		46.91% Pervious Area
	33,707		53.09% Impervious Area
	8,116		24.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA23A:

Runoff = 0.01 cfs @ 14.83 hrs, Volume= 0.007 af, Depth= 0.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
	12,450	39	>75% Grass cover, Good, HSG A
	16,250	30	Woods, Good, HSG A
	28,700	34	Weighted Average
	28,700		100.00% Pervious Area

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Type III 24-hr 25-yr Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, ab
					Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	70	0.0900	4.83		Shallow Concentrated Flow, bc
					Unpaved Kv= 16.1 fps
7.7	120	Total			

Summary for Subcatchment PDA24:

Runoff = 0.16 cfs @ 12.15 hrs, Volume= 0.027 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	2,724	98	Pavement, HSG A
	19,674	39	>75% Grass cover, Good, HSG A
	3,110	30	Woods, Good, HSG A
	25,508	44	Weighted Average
	22,784		89.32% Pervious Area
	2,724		10.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA26: Uncontrolled (all RD)

Runoff = 2.43 cfs @ 12.30 hrs, Volume= 0.404 af, Depth= 0.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
	33,333	74	>75% Grass cover, Good, HSG C
	143,474	39	>75% Grass cover, Good, HSG A
	113,573	30	Woods, Good, HSG A
	5,366	80	>75% Grass cover, Good, HSG D
	19,695	77	Woods, Good, HSG D
	25,769	70	Woods, Good, HSG C
*	4,500	98	lots 129 and 130 long drives
	345,710	45	Weighted Average
	341,210		98.70% Pervious Area
	4,500		1.30% Impervious Area

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Type III 24-hr 25-yr Rainfall=5.50"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	450	0.0150	1.97		Shallow Concentrated Flow, b Unpaved Kv= 16.1 fps
10.9	500	Total			

Summary for Subcatchment PDA26A: Uncontrolled from Fern Path lots (all RD)

Runoff = 3.73 cfs @ 12.39 hrs, Volume= 0.455 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
13,183	74	>75% Grass cover, Good, HSG C
66,432	70	Woods, Good, HSG C
12,190	77	Woods, Good, HSG D
91,805	72	Weighted Average
91,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	225	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
27.5	275	Total			

Summary for Subcatchment PDA26B: Upland Near Fern Path

Runoff = 4.53 cfs @ 12.23 hrs, Volume= 0.447 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
76,546	70	Woods, Good, HSG C
16,894	77	Woods, Good, HSG D
93,440	71	Weighted Average
93,440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	120	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
16.3	170	Total			

Summary for Subcatchment PDA27A: To RG-6

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

Runoff = 0.60 cfs @ 12.07 hrs, Volume= 0.041 af, Depth= 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-yr Rainfall=5.50"

Area (sf)	CN	Description
7,800	74	>75% Grass cover, Good, HSG C
7,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.20"
0.9	90	0.0100	1.61		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
4.5	140	Total			

Summary for Reach DP4: East Swamp

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

Inflow Area = 19.720 ac, 14.91% Impervious, Inflow Depth > 1.01" for 25-yr event
 Inflow = 12.80 cfs @ 12.31 hrs, Volume= 1.659 af
 Outflow = 12.80 cfs @ 12.31 hrs, Volume= 1.659 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Summary for Pond B10: Det. Basin #10

[81] Warning: Exceeded Pond LC4 by 0.21' @ 14.85 hrs

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 1.95" for 25-yr event
 Inflow = 2.28 cfs @ 12.13 hrs, Volume= 0.161 af
 Outflow = 0.15 cfs @ 14.53 hrs, Volume= 0.161 af, Atten= 93%, Lag= 143.7 min
 Primary = 0.15 cfs @ 14.53 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.73' @ 14.53 hrs Surf.Area= 2,479 sf Storage= 3,710 cf

Plug-Flow detention time=297.0 min calculated for 0.161 af (100% of inflow)
 Center-of-Mass det. time= 295.5 min (1,138.5 - 843.0)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.50	415	97.0	0	0	415
270.00	1,380	210.0	425	425	3,177
272.00	2,683	235.0	3,991	4,417	4,168
274.00	4,100	269.0	6,733	11,150	5,621

Device	Routing	Invert	Outlet Devices
#1	Primary	269.50'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Primary OutFlow Max=0.15 cfs @ 14.53 hrs HW=271.73' (Free Discharge)↑ **1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 7.05 fps)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B15: Basin #15**

Inflow Area = 0.586 ac, 10.68% Impervious, Inflow Depth = 0.56" for 25-yr event
 Inflow = 0.16 cfs @ 12.15 hrs, Volume= 0.027 af
 Outflow = 0.04 cfs @ 13.99 hrs, Volume= 0.027 af, Atten= 75%, Lag= 110.6 min
 Discarded = 0.04 cfs @ 13.99 hrs, Volume= 0.027 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 264.41' @ 13.99 hrs Surf.Area= 722 sf Storage= 254 cf

Plug-Flow detention time= 65.5 min calculated for 0.027 af (100% of inflow)

Center-of-Mass det. time= 65.3 min (1,001.8 - 936.5)

Volume	Invert	Avail.Storage	Storage Description
#1	264.00'	7,324 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.00	530	103.9	0	0	530
266.00	1,761	191.4	2,171	2,171	2,607
268.00	3,489	301.2	5,152	7,324	6,940

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	266.00'	12.0" Round Emergency Overflow Culvert L= 58.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 266.00' / 265.42' S= 0.0100' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.04 cfs @ 13.99 hrs HW=264.41' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.04 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=264.00' (Free Discharge)↑ **2=Emergency Overflow Culvert** (Controls 0.00 cfs)

Summary for Pond B16: Basin #16

Inflow Area = 0.408 ac, 27.54% Impervious, Inflow Depth = 3.43" for 25-yr event
 Inflow = 1.60 cfs @ 12.09 hrs, Volume= 0.117 af
 Outflow = 0.95 cfs @ 12.22 hrs, Volume= 0.117 af, Atten= 41%, Lag= 7.8 min
 Discarded = 0.25 cfs @ 12.22 hrs, Volume= 0.100 af
 Primary = 0.70 cfs @ 12.22 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.40' @ 12.22 hrs Surf.Area= 1,281 sf Storage= 1,192 cf

Plug-Flow detention time= 34.6 min calculated for 0.117 af (100% of inflow)
 Center-of-Mass det. time= 34.6 min (849.7 - 815.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	271.00'	3,193 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	555	117.4	0	0	555
272.00	949	139.3	743	743	1,020
273.50	2,431	218.3	2,449	3,193	3,284

Device	Routing	Invert	Outlet Devices											
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area											
#2	Primary	272.25'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir											
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	
				2.50	3.00	3.50	4.00	4.50	5.00	5.50				
			Coef. (English)	2.34	2.50	2.70	2.68	2.68	2.66	2.65	2.65	2.65		
				2.65	2.67	2.66	2.68	2.70	2.74	2.79	2.88			

Discarded OutFlow Max=0.24 cfs @ 12.22 hrs HW=272.40' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.66 cfs @ 12.22 hrs HW=272.40' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 0.66 cfs @ 0.90 fps)

Summary for Pond B7: Basin #7

Inflow Area = 1.457 ac, 53.09% Impervious, Inflow Depth = 2.41" for 25-yr event
 Inflow = 4.01 cfs @ 12.10 hrs, Volume= 0.293 af
 Outflow = 0.26 cfs @ 14.41 hrs, Volume= 0.293 af, Atten= 94%, Lag= 139.0 min
 Discarded = 0.26 cfs @ 14.41 hrs, Volume= 0.293 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 262.57' @ 14.41 hrs Surf.Area= 4,669 sf Storage= 6,071 cf

Plug-Flow detention time= 261.5 min calculated for 0.293 af (100% of inflow)
 Center-of-Mass det. time= 261.3 min (1,104.0 - 842.6)

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Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	15,989 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
261.00	3,170	255.0	0	0	3,170
262.00	4,030	275.0	3,591	3,591	4,054
264.00	6,476	335.0	10,410	14,001	7,030
264.30	6,777	338.0	1,988	15,989	7,220

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	263.30'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.26 cfs @ 14.41 hrs HW=262.57' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.26 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=261.00' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B8: Basin #8**

Inflow Area = 1.956 ac, 42.31% Impervious, Inflow Depth = 1.99" for 25-yr event
 Inflow = 3.98 cfs @ 12.13 hrs, Volume= 0.325 af
 Outflow = 2.32 cfs @ 12.32 hrs, Volume= 0.325 af, Atten= 42%, Lag= 11.4 min
 Discarded = 0.36 cfs @ 12.32 hrs, Volume= 0.212 af
 Primary = 1.96 cfs @ 12.32 hrs, Volume= 0.113 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 266.81' @ 12.32 hrs Surf.Area= 1,898 sf Storage= 3,085 cf

Plug-Flow detention time= 44.8 min calculated for 0.325 af (100% of inflow)
 Center-of-Mass det. time= 44.7 min (902.0 - 857.2)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,534 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.50	818	176.0	0	0	818
266.00	1,502	197.8	1,714	1,714	1,524
268.30	2,752	231.2	4,820	6,534	2,767

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	265.75'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.50'	2.0' long x 1.80' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.5' Crest Height

Discarded OutFlow Max=0.36 cfs @ 12.32 hrs HW=266.80' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.36 cfs)

Primary OutFlow Max=1.94 cfs @ 12.32 hrs HW=266.80' (Free Discharge)

↑ **2=Orifice/Grate** (Orifice Controls 0.85 cfs @ 4.32 fps)

↑ **3=Sharp-Crested Rectangular Weir**(Weir Controls 1.09 cfs @ 1.85 fps)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 0.58" for 25-yr event
 Inflow = 1.06 cfs @ 12.42 hrs, Volume= 0.063 af
 Outflow = 0.47 cfs @ 12.67 hrs, Volume= 0.063 af, Atten= 56%, Lag= 15.4 min
 Primary = 0.47 cfs @ 12.67 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.66' @ 12.67 hrs Surf.Area= 853 sf Storage= 535 cf

Plug-Flow detention time= 10.7 min calculated for 0.063 af (100% of inflow)

Center-of-Mass det. time= 10.5 min (809.1 - 798.6)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,568 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.20	50	50.0	0	0	50
271.00	364	272.0	146	146	5,740
272.00	1,189	287.0	737	883	6,463
274.00	2,585	313.0	3,685	4,568	7,842

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.0' Crest Height
#2	Primary	270.25'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.47 cfs @ 12.67 hrs HW=271.65' (Free Discharge)

↑ **1=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

↑ **2=Orifice/Grate** (Orifice Controls 0.47 cfs @ 5.36 fps)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 1.99" for 25-yr event
 Inflow = 2.76 cfs @ 12.11 hrs, Volume= 0.215 af
 Outflow = 1.17 cfs @ 12.42 hrs, Volume= 0.215 af, Atten= 58%, Lag= 18.1 min
 Discarded = 0.11 cfs @ 11.55 hrs, Volume= 0.152 af
 Primary = 1.06 cfs @ 12.42 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

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Peak Elev= 273.66' @ 12.42 hrs Surf.Area= 0.045 ac Storage= 0.069 af

Plug-Flow detention time=208.5 min calculated for 0.215 af (100% of inflow)

Center-of-Mass det. time= 208.7 min (1,065.0 - 856.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.030 af	11.33'W x 172.00'L x 2.71'H Field A 0.121 af Overall - 0.047 af Embedded = 0.074 af x 40.0% Voids
#2A	271.40'	0.047 af	Cultec R-280HD x 48 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		0.077 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.30'	6.0" Round Culvert X 4.00 L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.30' / 273.20' S= 0.0100 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.55 hrs HW=271.43' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)**Primary OutFlow** Max=1.03 cfs @ 12.42 hrs HW=273.65' (Free Discharge)↑**2=Culvert** (Barrel Controls 1.03 cfs @ 2.44 fps)**Summary for Pond LC4: Leaching Chamber Bed #4**

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 2.24" for 25-yr event
 Inflow = 2.38 cfs @ 12.12 hrs, Volume= 0.186 af
 Outflow = 2.29 cfs @ 12.13 hrs, Volume= 0.184 af, Atten= 3%, Lag= 0.8 min
 Discarded = 0.01 cfs @ 10.40 hrs, Volume= 0.023 af
 Primary = 2.28 cfs @ 12.13 hrs, Volume= 0.161 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 271.94' @ 12.13 hrs Surf.Area= 0.013 ac Storage= 0.012 af

Plug-Flow detention time=43.8 min calculated for 0.183 af (99% of inflow)

Center-of-Mass det. time= 38.5 min (887.8 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.50'	0.008 af	16.50'W x 35.50'L x 2.04'H Field A 0.027 af Overall - 0.008 af Embedded = 0.020 af x 40.0% Voids
#2A	270.50'	0.008 af	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		0.016 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	271.40'	8.0" Round Culvert X 3.00 L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.90' S= 0.0100 ' S= 0.0100 ' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.01 cfs @ 10.40 hrs HW=270.52' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.23 cfs @ 12.13 hrs HW=271.93' (Free Discharge)

↑**2=Culvert** (Inlet Controls 2.23 cfs @ 2.49 fps)

Summary for Pond RG4: Rain Garden #4

Inflow Area = 0.659 ac, 0.00% Impervious, Inflow Depth = 0.12" for 25-yr event
 Inflow = 0.01 cfs @ 14.83 hrs, Volume= 0.007 af
 Outflow = 0.01 cfs @ 15.75 hrs, Volume= 0.007 af, Atten= 10%, Lag= 55.5 min
 Discarded = 0.01 cfs @ 15.75 hrs, Volume= 0.007 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 265.05' @ 15.75 hrs Surf.Area= 177 sf Storage= 8 cf

Plug-Flow detention time=5.9 min calculated for 0.007 af (100% of inflow)

Center-of-Mass det. time= 5.9 min (1,068.8 - 1,062.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	265.00'	334 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
265.00	164	114.0	0	0	164	
266.00	541	134.9	334	334	596	

Device	Routing	Invert	Outlet Devices
#1	Discarded	265.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.75'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.01 cfs @ 15.75 hrs HW=265.05' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=265.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RG6: Rain Garden #6

Inflow Area = 0.179 ac, 0.00% Impervious, Inflow Depth = 2.77" for 25-yr event
 Inflow = 0.60 cfs @ 12.07 hrs, Volume= 0.041 af
 Outflow = 0.20 cfs @ 12.38 hrs, Volume= 0.041 af, Atten= 66%, Lag= 18.5 min
 Discarded = 0.20 cfs @ 12.38 hrs, Volume= 0.041 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.28' @ 12.38 hrs Surf.Area= 1,046 sf Storage= 282 cf

Plug-Flow detention time= 7.1 min calculated for 0.041 af (100% of inflow)
 Center-of-Mass det. time= 7.1 min (838.6 - 831.5)

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	751 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	937	118.0	0	0	937
271.70	1,215	131.0	751	751	1,209

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	271.50'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50
			Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
			2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.20 cfs @ 12.38 hrs HW=271.28' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Subcatchment PDA-27: All RD

Runoff = 2.09 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 4.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	4,896	98	roads, sidewalks, drives, HSG C
	12,884	74	>75% Grass cover, Good, HSG C
	17,780	81	Weighted Average
	12,884		72.46% Pervious Area
	4,896		27.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB
					Grass: Short n= 0.150 P2= 3.20"
0.3	35	0.0200	2.28		Shallow Concentrated Flow, BC
					Unpaved Kv= 16.1 fps
0.2	30	0.0100	2.03		Shallow Concentrated Flow, CD
					Paved Kv= 20.3 fps
6.1	115	Total			

Summary for Subcatchment PDA18: Rear RD

Runoff = 3.40 cfs @ 12.12 hrs, Volume= 0.262 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	17,400	98	roads, sidewalks, drives, HSG A
	4,031	98	Unconnected roofs, HSG A
	21,805	39	>75% Grass cover, Good, HSG A
	43,236	68	Weighted Average
	21,805		50.43% Pervious Area
	21,431		49.57% Impervious Area
	4,031		18.81% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
2.2	272	0.0100	2.03		Shallow Concentrated Flow, bc
					Paved Kv= 20.3 fps
7.8	322	Total			

Summary for Subcatchment PDA21: All RD

Runoff = 4.06 cfs @ 12.11 hrs, Volume= 0.310 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	24,780	98	roads, sidewalks, drives, HSG A
	31,545	39	>75% Grass cover, Good, HSG A
	56,325	65	Weighted Average
	31,545		56.01% Pervious Area
	24,780		43.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, ab
					Grass: Short n= 0.150 P2= 3.20"
0.4	53	0.0200	2.28		Shallow Concentrated Flow, bc
					Unpaved Kv= 16.1 fps
1.3	157	0.0100	2.03		Shallow Concentrated Flow, cd
					Paved Kv= 20.3 fps
7.3	260	Total			

Summary for Subcatchment PDA22: All RD

Runoff = 5.91 cfs @ 12.12 hrs, Volume= 0.468 af, Depth= 2.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	33,941	98	roads, sidewalks, drives, HSG A
*	2,107	98	roads, sidewalks, drives, HSG D
	47,815	39	>75% Grass cover, Good, HSG A
	1,327	80	>75% Grass cover, Good, HSG D
	85,190	65	Weighted Average
	49,142		57.69% Pervious Area
	36,048		42.31% Impervious Area

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0200	0.15		Sheet Flow, AB Grass: Short n= 0.150 P2= 3.20"
0.2	26	0.0200	2.28		Shallow Concentrated Flow, BC Unpaved Kv= 16.1 fps
1.6	235	0.0150	2.49		Shallow Concentrated Flow, CD Paved Kv= 20.3 fps
0.9	225	0.0080	4.06	3.19	Pipe Channel, DE 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013 Concrete pipe, straight & clean
8.3	536	Total			

Summary for Subcatchment PDA23: Rear RD

Runoff = 5.64 cfs @ 12.09 hrs, Volume= 0.409 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	25,591	98	roads, sidewalks, drives, HSG A
	29,781	39	>75% Grass cover, Good, HSG A
	8,116	98	Unconnected roofs, HSG A
	63,488	70	Weighted Average
	29,781		46.91% Pervious Area
	33,707		53.09% Impervious Area
	8,116		24.08% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA23A:

Runoff = 0.07 cfs @ 12.44 hrs, Volume= 0.020 af, Depth= 0.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
	12,450	39	>75% Grass cover, Good, HSG A
	16,250	30	Woods, Good, HSG A
	28,700	34	Weighted Average
	28,700		100.00% Pervious Area

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	50	0.0700	0.11		Sheet Flow, ab Woods: Light underbrush n= 0.400 P2= 3.20"
0.2	70	0.0900	4.83		Shallow Concentrated Flow, bc Unpaved Kv= 16.1 fps
7.7	120	Total			

Summary for Subcatchment PDA24:

Runoff = 0.47 cfs @ 12.12 hrs, Volume= 0.050 af, Depth= 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
* 2,724	98	Pavement, HSG A
19,674	39	>75% Grass cover, Good, HSG A
3,110	30	Woods, Good, HSG A
25,508	44	Weighted Average
22,784		89.32% Pervious Area
2,724		10.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR55-MIN

Summary for Subcatchment PDA26: Uncontrolled (all RD)

Runoff = 6.08 cfs @ 12.20 hrs, Volume= 0.727 af, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
33,333	74	>75% Grass cover, Good, HSG C
143,474	39	>75% Grass cover, Good, HSG A
113,573	30	Woods, Good, HSG A
5,366	80	>75% Grass cover, Good, HSG D
19,695	77	Woods, Good, HSG D
25,769	70	Woods, Good, HSG C
* 4,500	98	lots 129 and 130 long drives
345,710	45	Weighted Average
341,210		98.70% Pervious Area
4,500		1.30% Impervious Area

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.1	50	0.0800	0.12		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
3.8	450	0.0150	1.97		Shallow Concentrated Flow, b Unpaved Kv= 16.1 fps
10.9	500	Total			

Summary for Subcatchment PDA26A: Uncontrolled from Fern Path lots (all RD)

Runoff = 5.18 cfs @ 12.39 hrs, Volume= 0.628 af, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
13,183	74	>75% Grass cover, Good, HSG C
66,432	70	Woods, Good, HSG C
12,190	77	Woods, Good, HSG D
91,805	72	Weighted Average
91,805		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
7.5	225	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
27.5	275	Total			

Summary for Subcatchment PDA26B: Upland Near Fern Path

Runoff = 6.34 cfs @ 12.23 hrs, Volume= 0.621 af, Depth= 3.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
76,546	70	Woods, Good, HSG C
16,894	77	Woods, Good, HSG D
93,440	71	Weighted Average
93,440		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.3	50	0.0200	0.07		Sheet Flow, a Woods: Light underbrush n= 0.400 P2= 3.20"
4.0	120	0.0100	0.50		Shallow Concentrated Flow, b Woodland Kv= 5.0 fps
16.3	170	Total			

Summary for Subcatchment PDA27A: To RG-6[49] Hint: $T_c < 2dt$ may require smaller dt

Runoff = 0.82 cfs @ 12.07 hrs, Volume= 0.056 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, $dt=0.05$ hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

Area (sf)	CN	Description
7,800	74	>75% Grass cover, Good, HSG C
7,800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.6	50	0.0600	0.23		Sheet Flow,
					Grass: Short n= 0.150 P2= 3.20"
0.9	90	0.0100	1.61		Shallow Concentrated Flow,
					Unpaved Kv= 16.1 fps
4.5	140	Total			

Summary for Reach DP4: East Swamp

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

Inflow Area = 19.720 ac, 14.91% Impervious, Inflow Depth > 1.58" for 100-Yr Storm event
 Inflow = 22.12 cfs @ 12.23 hrs, Volume= 2.590 af
 Outflow = 22.12 cfs @ 12.23 hrs, Volume= 2.590 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, $dt=0.05$ hrs**Summary for Pond B10: Det. Basin #10**

[81] Warning: Exceeded Pond LC4 by 1.01' @ 15.40 hrs

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 2.86" for 100-Yr Storm event
 Inflow = 3.26 cfs @ 12.13 hrs, Volume= 0.237 af
 Outflow = 0.18 cfs @ 15.07 hrs, Volume= 0.224 af, Atten= 94%, Lag= 176.2 min
 Primary = 0.18 cfs @ 15.07 hrs, Volume= 0.224 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, $dt=0.05$ hrs
 Peak Elev= 272.54' @ 15.07 hrs Surf.Area= 3,033 sf Storage= 5,948 cf

Plug-Flow detention time= 390.2 min calculated for 0.223 af (94% of inflow)
 Center-of-Mass det. time= 361.8 min (1,198.3 - 836.5)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 cf	Custom Stage Data (Irregular) Listed below (Recalc)

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Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.50	415	97.0	0	0	415
270.00	1,380	210.0	425	425	3,177
272.00	2,683	235.0	3,991	4,417	4,168
274.00	4,100	269.0	6,733	11,150	5,621

Device	Routing	Invert	Outlet Devices
#1	Primary	269.50'	2.0" Vert. Orifice/Grate C= 0.600
#2	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 3.0' Crest Height

Primary OutFlow Max=0.18 cfs @ 15.07 hrs HW=272.54' (Free Discharge)↑ **1=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.27 fps)↑ **2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)**Summary for Pond B15: Basin #15**

Inflow Area = 0.586 ac, 10.68% Impervious, Inflow Depth = 1.02" for 100-Yr Storm event
 Inflow = 0.47 cfs @ 12.12 hrs, Volume= 0.050 af
 Outflow = 0.06 cfs @ 14.74 hrs, Volume= 0.050 af, Atten= 88%, Lag= 156.9 min
 Discarded = 0.06 cfs @ 14.74 hrs, Volume= 0.050 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 264.97' @ 14.74 hrs Surf.Area= 1,038 sf Storage= 748 cf

Plug-Flow detention time= 159.2 min calculated for 0.050 af (100% of inflow)
 Center-of-Mass det. time= 159.0 min (1,067.5 - 908.5)

Volume	Invert	Avail.Storage	Storage Description
#1	264.00'	7,324 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.00	530	103.9	0	0	530
266.00	1,761	191.4	2,171	2,171	2,607
268.00	3,489	301.2	5,152	7,324	6,940

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	266.00'	12.0" Round Emergency Overflow Culvert L= 58.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 266.00' / 265.42' S= 0.0100' /' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Discarded OutFlow Max=0.06 cfs @ 14.74 hrs HW=264.97' (Free Discharge)↑ **1=Exfiltration** (Exfiltration Controls 0.06 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=264.00' (Free Discharge)↑ **2=Emergency Overflow Culvert** (Controls 0.00 cfs)

Summary for Pond B16: Basin #16

Inflow Area = 0.408 ac, 27.54% Impervious, Inflow Depth = 4.53" for 100-Yr Storm event
 Inflow = 2.09 cfs @ 12.09 hrs, Volume= 0.154 af
 Outflow = 1.73 cfs @ 12.16 hrs, Volume= 0.154 af, Atten= 17%, Lag= 4.2 min
 Discarded = 0.26 cfs @ 12.16 hrs, Volume= 0.119 af
 Primary = 1.47 cfs @ 12.16 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 272.50' @ 12.16 hrs Surf.Area= 1,366 sf Storage= 1,317 cf

Plug-Flow detention time= 32.3 min calculated for 0.154 af (100% of inflow)
 Center-of-Mass det. time= 32.2 min (839.5 - 807.3)

Volume	Invert	Avail.Storage	Storage Description
#1	271.00'	3,193 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	555	117.4	0	0	555
272.00	949	139.3	743	743	1,020
273.50	2,431	218.3	2,449	3,193	3,284

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area
#2	Primary	272.25'	5.0' long x 5.0' breadth Broad-Crested Rectangular Weir
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00
			2.50 3.00 3.50 4.00 4.50 5.00 5.50
			Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65
			2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Discarded OutFlow Max=0.26 cfs @ 12.16 hrs HW=272.49' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=1.42 cfs @ 12.16 hrs HW=272.49' (Free Discharge)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 1.42 cfs @ 1.17 fps)

Summary for Pond B7: Basin #7

Inflow Area = 1.457 ac, 53.09% Impervious, Inflow Depth = 3.37" for 100-Yr Storm event
 Inflow = 5.64 cfs @ 12.09 hrs, Volume= 0.409 af
 Outflow = 0.30 cfs @ 14.91 hrs, Volume= 0.407 af, Atten= 95%, Lag= 169.2 min
 Discarded = 0.30 cfs @ 14.91 hrs, Volume= 0.407 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 263.20' @ 14.91 hrs Surf.Area= 5,434 sf Storage= 9,270 cf

Plug-Flow detention time= 349.1 min calculated for 0.407 af (99% of inflow)
 Center-of-Mass det. time= 346.1 min (1,179.0 - 832.9)

OE2765-POST-EAST-7.11.17

Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Volume	Invert	Avail.Storage	Storage Description
#1	261.00'	15,989 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
261.00	3,170	255.0	0	0	3,170
262.00	4,030	275.0	3,591	3,591	4,054
264.00	6,476	335.0	10,410	14,001	7,030
264.30	6,777	338.0	1,988	15,989	7,220

Device	Routing	Invert	Outlet Devices
#1	Discarded	261.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	263.30'	5.0' long x 20.0' 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

Discarded OutFlow Max=0.30 cfs @ 14.91 hrs HW=263.20' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.30 cfs)**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=261.00' (Free Discharge)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)**Summary for Pond B8: Basin #8**

Inflow Area = 1.956 ac, 42.31% Impervious, Inflow Depth = 2.87" for 100-Yr Storm event
 Inflow = 5.91 cfs @ 12.12 hrs, Volume= 0.468 af
 Outflow = 4.54 cfs @ 12.22 hrs, Volume= 0.468 af, Atten= 23%, Lag= 5.8 min
 Discarded = 0.40 cfs @ 12.22 hrs, Volume= 0.253 af
 Primary = 4.14 cfs @ 12.22 hrs, Volume= 0.215 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 267.12' @ 12.22 hrs Surf.Area= 2,064 sf Storage= 3,703 cf

Plug-Flow detention time=40.2 min calculated for 0.467 af (100% of inflow)
 Center-of-Mass det. time= 40.1 min (886.5 - 846.4)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,534 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
264.50	818	176.0	0	0	818
266.00	1,502	197.8	1,714	1,714	1,524
268.30	2,752	231.2	4,820	6,534	2,767

Device	Routing	Invert	Outlet Devices
#1	Discarded	264.50'	8.270 in/hr Exfiltration over Surface area
#2	Primary	265.75'	6.0" Vert. Orifice/Grate C= 0.600
#3	Primary	266.50'	2.0' long x 1.80' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 1.5' Crest Height

Discarded OutFlow Max=0.39 cfs @ 12.22 hrs HW=267.11' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=4.04 cfs @ 12.22 hrs HW=267.11' (Free Discharge)

↑ **2=Orifice/Grate** (Orifice Controls 0.99 cfs @ 5.07 fps)

↑ **3=Sharp-Crested Rectangular Weir** (Weir Controls 3.05 cfs @ 2.67 fps)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 1.31" for 100-Yr Storm event
 Inflow = 2.49 cfs @ 12.24 hrs, Volume= 0.141 af
 Outflow = 0.66 cfs @ 12.68 hrs, Volume= 0.141 af, Atten= 74%, Lag= 26.4 min
 Primary = 0.66 cfs @ 12.68 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 272.85' @ 12.68 hrs Surf.Area= 1,720 sf Storage= 2,119 cf

Plug-Flow detention time= 32.1 min calculated for 0.140 af (100% of inflow)

Center-of-Mass det. time= 31.9 min (823.2 - 791.3)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,568 cf	Custom Stage Data (Irregular) listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
270.20	50	50.0	0	0	50
271.00	364	272.0	146	146	5,740
272.00	1,189	287.0	737	883	6,463
274.00	2,585	313.0	3,685	4,568	7,842

Device	Routing	Invert	Outlet Devices
#1	Primary	273.00'	10.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s) 2.0' Crest Height
#2	Primary	270.25'	4.0" Vert. Orifice/Grate C= 0.600

Primary OutFlow Max=0.66 cfs @ 12.68 hrs HW=272.85' (Free Discharge)

↑ **1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **2=Orifice/Grate** (Orifice Controls 0.66 cfs @ 7.52 fps)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.293 ac, 43.99% Impervious, Inflow Depth = 2.87" for 100-Yr Storm event
 Inflow = 4.06 cfs @ 12.11 hrs, Volume= 0.310 af
 Outflow = 2.60 cfs @ 12.24 hrs, Volume= 0.310 af, Atten= 36%, Lag= 7.8 min
 Discarded = 0.11 cfs @ 11.15 hrs, Volume= 0.169 af
 Primary = 2.49 cfs @ 12.24 hrs, Volume= 0.141 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

OE2765-POST-EAST-7.11.17

Type III 24-hr 100-Yr Storm Rainfall=6.70"

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Peak Elev= 274.02' @ 12.24 hrs Surf.Area= 0.045 ac Storage= 0.075 af

Plug-Flow detention time=165.1 min calculated for 0.309 af (100% of inflow)

Center-of-Mass det. time= 166.1 min (1,011.5 - 845.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.030 af	11.33'W x 172.00'L x 2.71'H Field A 0.121 af Overall - 0.047 af Embedded = 0.074 af x 40.0% Voids
#2A	271.40'	0.047 af	Cultec R-280HD x 48 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 2 rows
		0.077 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.40'	2.410 in/hr Exfiltration over Surface area
#2	Primary	273.30'	6.0" Round Culvert X 4.00 L= 10.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.30' / 273.20' S= 0.0100 ' / Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.15 hrs HW=271.43' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)**Primary OutFlow** Max=2.47 cfs @ 12.24 hrs HW=274.02' (Free Discharge)↑**2=Culvert** (Barrel Controls 2.47 cfs @ 3.14 fps)**Summary for Pond LC4: Leaching Chamber Bed #4**

Inflow Area = 0.993 ac, 49.57% Impervious, Inflow Depth = 3.17" for 100-Yr Storm event
 Inflow = 3.40 cfs @ 12.12 hrs, Volume= 0.262 af
 Outflow = 3.27 cfs @ 12.13 hrs, Volume= 0.260 af, Atten= 4%, Lag= 1.1 min
 Discarded = 0.01 cfs @ 9.65 hrs, Volume= 0.024 af
 Primary = 3.26 cfs @ 12.13 hrs, Volume= 0.237 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 272.15' @ 12.13 hrs Surf.Area= 0.013 ac Storage= 0.013 af

Plug-Flow detention time=32.9 min calculated for 0.260 af (99% of inflow)

Center-of-Mass det. time= 28.7 min (867.8 - 839.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.50'	0.008 af	16.50'W x 35.50'L x 2.04'H Field A 0.027 af Overall - 0.008 af Embedded = 0.020 af x 40.0% Voids
#2A	270.50'	0.008 af	Cultec R-150XLHD x 12 Inside #1 Effective Size= 29.8"W x 18.0"H => 2.65 sf x 10.25'L = 27.2 cf Overall Size= 33.0"W x 18.5"H x 11.00'L with 0.75' Overlap Row Length Adjustment= +0.75' x 2.65 sf x 4 rows
		0.016 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.50'	1.020 in/hr Exfiltration over Surface area
#2	Primary	271.40'	8.0" Round Culvert X 3.00 L= 50.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.40' / 270.90' S= 0.0100 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.35 sf

Discarded OutFlow Max=0.01 cfs @ 9.65 hrs HW=270.52' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.19 cfs @ 12.13 hrs HW=272.13' (Free Discharge)

↑**2=Culvert** (Inlet Controls 3.19 cfs @ 3.05 fps)

Summary for Pond RG4: Rain Garden #4

Inflow Area = 0.659 ac, 0.00% Impervious, Inflow Depth = 0.36" for 100-Yr Storm event
 Inflow = 0.07 cfs @ 12.44 hrs, Volume= 0.020 af
 Outflow = 0.02 cfs @ 15.89 hrs, Volume= 0.020 af, Atten= 66%, Lag= 207.0 min
 Discarded = 0.02 cfs @ 15.89 hrs, Volume= 0.020 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 265.71' @ 15.89 hrs Surf.Area= 409 sf Storage= 197 cf

Plug-Flow detention time= 111.9 min calculated for 0.020 af (100% of inflow)

Center-of-Mass det. time= 111.8 min (1,099.4 - 987.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	265.00'	334 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
265.00	164	114.0	0	0	164	
266.00	541	134.9	334	334	596	

Device	Routing	Invert	Outlet Devices
#1	Discarded	265.00'	2.410 in/hr Exfiltration over Surface area
#2	Primary	265.75'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Discarded OutFlow Max=0.02 cfs @ 15.89 hrs HW=265.71' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=265.00' (Free Discharge)

↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond RG6: Rain Garden #6

Inflow Area = 0.179 ac, 0.00% Impervious, Inflow Depth = 3.78" for 100-Yr Storm event
 Inflow = 0.82 cfs @ 12.07 hrs, Volume= 0.056 af
 Outflow = 0.22 cfs @ 12.44 hrs, Volume= 0.056 af, Atten= 73%, Lag= 22.3 min
 Discarded = 0.22 cfs @ 12.44 hrs, Volume= 0.056 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
 Peak Elev= 271.50' @ 12.44 hrs Surf.Area= 1,131 sf Storage= 514 cf

Plug-Flow detention time=13.3 min calculated for 0.056 af (100% of inflow)
 Center-of-Mass det. time= 13.2 min (835.7 - 822.5)

Volume	Invert	Avail.Storage	Storage Description		
#1	271.00'	751 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
271.00	937	118.0	0	0	937
271.70	1,215	131.0	751	751	1,209

Device	Routing	Invert	Outlet Devices											
#1	Discarded	271.00'	8.270 in/hr Exfiltration over Surface area											
#2	Primary	271.50'	3.0' long x 3.0' breadth Broad-Crested Rectangular Weir											
			Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00	
				2.50	3.00	3.50	4.00	4.50						
			Coef. (English)	2.44	2.58	2.68	2.67	2.65	2.64	2.64	2.68	2.68		
				2.72	2.81	2.92	2.97	3.07	3.32					

Discarded OutFlow Max=0.22 cfs @ 12.44 hrs HW=271.50' (Free Discharge)

↑ **1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=271.00' (Free Discharge)

↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Appendix E

Groundwater Recharge and Basin Drawdown Calculations (Standard #3)



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JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway

CALC BY: CJV
CHECK BY: JAP
DATE: 9/7/17
DATE: 9/7/17

STANDARD 3: GROUNDWATER RECHARGE CALCULATIONS

Required Recharge Volume

$R_v = F \times \text{impervious area (including green roofs \& porous pavement)}$

where F = Target Depth Factor

***Total Impervious Area=** 478,373 S.F. = 10.98 ACRES

*Total Impervious area does not include roof areas going to roof drains

	HSG A	HSG B	HSG C	HSG D
Impervious Area (sf)	353,677	0	117,725	6,971
Target Depth Factor (in.)	0.6	0.35	0.25	0.1
Annual Recharge Volume (cf)	17684	0	2453	58

Total required volume to recharge = 20,195 c.f.

CAPTURE AREA ADJUSTMENT:

Total Site Impervious Area	=	10.98	ACRES	
Total Impervious Area Directed to Infiltration BMPs	=	10.25	ACRES	
Adjustment Ratio	=	10.98	/	10.25 = 1.07
Adjusted Required Recharge Volume	=	20,195	x	1.07 = 21,637 c.f.
	=	21,637	/	43,560 = 0.497 a.f.

SIMPLE DYNAMIC METHOD:

Recharge Provided through exfiltration in Infiltration Basins 1-9 and 12-16

1.18" rainfall event required to produce *adjusted* required recharge volume

*Storm start time of 11 hours and end time of 13 hours (see attached hydrograph and drain summary)

Required Storage Volume, assuming exfiltration rate of 1.02 in/hr = 18,500 cf

Volume provided in Infiltration Basin 1 (below lowest outlet at 265.5):
Cumulative Vol. at 265.50 = 3,022 c.f.

Volume provided in Infiltration Basin 2 (below lowest outlet at 276.0):
Cumulative Vol. at 276.00 = 4,453 c.f.

Volume provided in Infiltration Basin 3 (below lowest outlet at 279.0):
Cumulative Vol. at 279.00 = 12,500 c.f.

Volume provided in Infiltration Basin 4 (below lowest outlet at 274.00):
Cumulative Vol. at 274.00 = 7,914 c.f.

Volume provided in Infiltration Basin 5 (below lowest outlet at 273.00):
Cumulative Vol. at 273.00 = 9,101 c.f.

Volume provided in Infiltration Basin 6 (below lowest outlet at 269.00):
Cumulative Vol. at 269.00 = 963 c.f.

Volume provided in Infiltration Basin 7 (below lowest outlet at 263.3):
Cumulative Vol. at 263.30 = 6,839 c.f.

Volume provided in Infiltration Basin 8 (below lowest outlet at 265.75):
Cumulative Vol. at 265.75 = 1,428 c.f.

Volume provided in Infiltration Basin 9 (below lowest outlet at 274.00):
Cumulative Vol. at 274.00 = 3,409 c.f.

Volume provided in Infiltration Basin 12 (below lowest outlet at 271.00):
Cumulative Vol. at 271.00 = 7,304 c.f.

Volume provided in Infiltration Basin 13 (below lowest outlet at 273.50):
Cumulative Vol. at 273.50 = 2,702 c.f.

Volume provided in Infiltration Basin 14 (below lowest outlet at 275.00):
Cumulative Vol. at 275.00 = 8,045 c.f.

Volume provided in Infiltration Basin 15 (below lowest outlet at 266.00):
Cumulative Vol. at 266.00 = 2,171 c.f.

Volume provided in Infiltration Basin 16 (below lowest outlet at 272.25):
Cumulative Vol. at 272.25 = 1,122 c.f.

STORAGE VOLUME PROVIDED

POND	TOTAL VOLUME (C.F.)	BOTTOM AREA (S.F.)
1	3,022	3,448
2	4,453	1,260
3	12,500	6,760
4	7,914	4,280
5	9,101	4,974
6	963	2,694
7	6,839	3,170
8	1,428	818
9	3,409	2,170
12	7,304	2,158
13	2,702	550
14	8,045	4,528
15	2,171	530
16	1,122	555
TOTAL	70,973	37,895

DRAWDOWN WITHIN 72 HOURS

DRAWDOWN TIME = (Rv)(1/IR)(12 inches/ 1 foot)(1/BA)

WHERE:

Rv = RECHARGE VOLUME IN CUBIC FEET

IR = DESIGN INFILTRATION RATE IN INCHES PER HOUR

BA = BOTTOM AREA IN SQUARE FEET

INFILTRATION BASIN 1

$$\text{DRAWDOWN TIME} = 3,022 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{3,448} = 4.36 \text{ Hours}$$

INFILTRATION BASIN 2

$$\text{DRAWDOWN TIME} = 4,453 \times \frac{1}{8.27} \times \frac{12}{1} \times \frac{1}{1,260} = 5.13 \text{ Hours}$$

INFILTRATION BASIN 3

$$\text{DRAWDOWN TIME} = 12,500 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{6,760} = 9.21 \text{ Hours}$$

INFILTRATION BASIN 4

$$\text{DRAWDOWN TIME} = 7,914 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{4,280} = 9.21 \text{ Hours}$$

INFILTRATION BASIN 5

$$\text{DRAWDOWN TIME} = 9,101 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{4,974} = 9.11 \text{ Hours}$$

INFILTRATION BASIN 6

$$\text{DRAWDOWN TIME} = 963 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{2,694} = 1.78 \text{ Hours}$$

INFILTRATION BASIN 7

$$\text{DRAWDOWN TIME} = 6,839 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{3,170} = 10.74 \text{ Hours}$$

INFILTRATION BASIN 8

$$\text{DRAWDOWN TIME} = 1,428 \times \frac{1}{8.27} \times \frac{12}{1} \times \frac{1}{818} = 2.53 \text{ Hours}$$

INFILTRATION BASIN 9

$$\text{DRAWDOWN TIME} = 3,409 \times \frac{1}{1.02} \times \frac{12}{1} \times \frac{1}{2,170} = 18.48 \text{ Hours}$$

INFILTRATION BASIN 12

$$\text{OWN} = 7,304 \times \frac{1}{8.27} \times \frac{12}{1} \times \frac{1}{2,158} = 4.91 \text{ Hours}$$

INFILTRATION BASIN 13

$$\text{DRAWDOWN TIME} = 2,702 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{550} = 24.46 \text{ Hours}$$

INFILTRATION BASIN 14

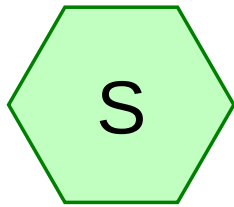
$$\text{DRAWDOWN TIME} = 8,045 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{4,528} = 8.85 \text{ Hours}$$

INFILTRATION BASIN 15

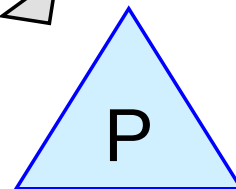
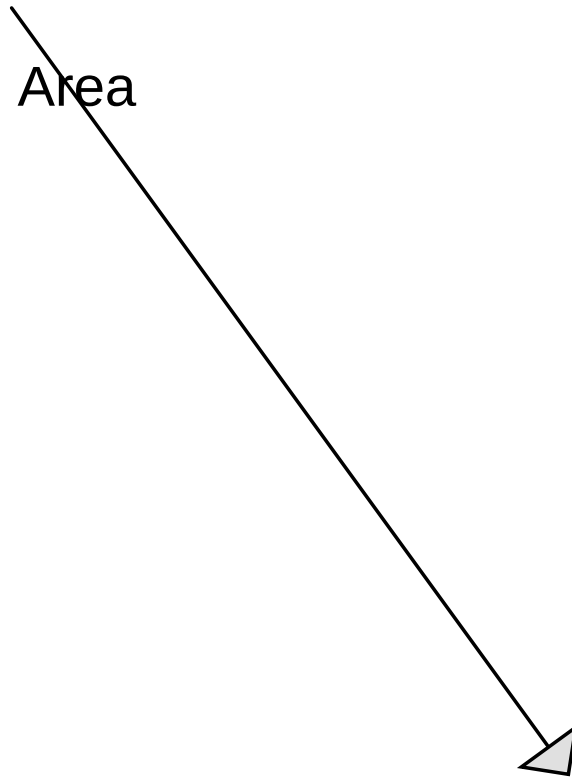
$$\text{DRAWDOWN TIME} = 2,171 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{530} = 20.40 \text{ Hours}$$

INFILTRATION BASIN 16

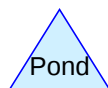
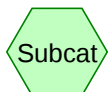
$$\text{DRAWDOWN TIME} = 1,122 \times \frac{1}{2.41} \times \frac{12}{1} \times \frac{1}{555} = 10.07 \text{ Hours}$$



Impervious Area



Recharge Volume



Routing Diagram for Recharge

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Recharge

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
10.980	98	Impervious (S)
10.980	98	TOTAL AREA

Recharge

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Type III 24-hr Recharge Rainfall=1.18"

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Summary for Subcatchment S: Impervious Area

Runoff = 11.53 cfs @ 12.09 hrs, Volume= 0.495 af, Depth> 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 11.00-13.00 hrs, dt= 0.05 hrs
Type III 24-hr Recharge Rainfall=1.18"

Area (ac)	CN	Description
* 10.980	98	Impervious
10.980		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Summary for Pond P: Recharge Volume

[82] Warning: Early inflow requires earlier time span

Inflow Area = 10.980 ac, 100.00% Impervious, Inflow Depth > 0.54" for Recharge event
Inflow = 11.53 cfs @ 12.09 hrs, Volume= 0.495 af
Outflow = 0.44 cfs @ 11.15 hrs, Volume= 0.074 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.44 cfs @ 11.15 hrs, Volume= 0.074 af

Routing by Dyn-Stor-Ind method, Time Span= 11.00-13.00 hrs, dt= 0.05 hrs
Peak Elev= 100.99' @ 13.00 hrs Surf.Area= 18,500 sf Storage= 18,278 cf

Plug-Flow detention time= 34.8 min calculated for 0.073 af (15% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	18,500 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	18,500	0	0
101.00	18,500	18,500	18,500

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	1.020 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.44 cfs @ 11.15 hrs HW=100.01' (Free Discharge)

↑ 1=Exfiltration (Exfiltration Controls 0.44 cfs)

Appendix F

Water Quality Volume, Sediment Forebay & TSS Removal Calcs (Standard #4)



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STANDARD 4: WATER QUALITY

WATER QUALITY VOLUME:

$V(WQ) = D(WQ) \times (12 \text{ IN.} / \text{FT}) \times A(\text{IMP})$

WHERE,

$V(WQ)$ = REQUIRED WATER QUALITY TREATMENT VOLUME IN CUBIC FEET

$D(WQ)$ = WATER QUALITY DEPTH (0.5 INCH OR 1 INCH)

$A(\text{IMP})$ = IMPERVIOUS AREA IN S.F.

WATER QUALITY VOLUME AT BASIN 1

CONTRIBUTING IMPERVIOUS AREA = 37,462 S.F.
 $V(WQ) = 0.5 \text{ IN.} \times 1 \text{ FT/12 IN.} \times 37,462 \text{ S.F.} = 1,561 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2ft)^2 \times 4ft) \times 5 \text{ CATCH BASINS} = 251 \text{ C.F.}$

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 337 C.F.

VOLUME PROVIDED AT POND 1 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 3,022 C.F.

TOTAL = 3,610 C.F.

WATER QUALITY VOLUME AT BASIN 2

CONTRIBUTING IMPERVIOUS AREA = 33,130 S.F.
 $V(WQ) = 0.5 \text{ IN.} \times 1 \text{ FT/12 IN.} \times 33,130 \text{ S.F.} = 1,380 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2ft)^2 \times 4ft) \times 3 \text{ CATCH BASINS} = 151 \text{ C.F.}$

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 285 C.F.

VOLUME PROVIDED AT POND 2 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 4,453 C.F.

TOTAL = 4,889 C.F.

WATER QUALITY VOLUME AT BASIN 3

CONTRIBUTING IMPERVIOUS AREA = 45,227 S.F.
 $V(WQ) = 1 \text{ IN.} \times 1 \text{ FT/12 IN.} \times 45,227 \text{ S.F.} = 3,769 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2ft)^2 \times 4ft) \times 4 \text{ CATCH BASINS} = 201 \text{ C.F.}$

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 378 C.F.

VOLUME PROVIDED AT POND 3 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 12,500 C.F.

TOTAL = 13,079 C.F.

WATER QUALITY VOLUME AT BASIN 4

CONTRIBUTING IMPERVIOUS AREA = 29,960 S.F.
 $V(WQ) = 0.5 \text{ IN.} \times 1 \text{ FT/12 IN.} \times 29,960 \text{ S.F.} = 1,248 \text{ C.F.}$

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

$(3.14 \times (2ft)^2 \times 4ft) \times 2 \text{ CATCH BASINS} = 101 \text{ C.F.}$

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 307 C.F.

VOLUME PROVIDED AT POND 4 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 7,914 C.F.

TOTAL = 8,322 C.F.



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WATER QUALITY VOLUME AT BASIN 5

CONTRIBUTING IMPERVIOUS AREA = 23,725 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 23,725 S.F. = 989 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 3 CATCH BASINS = 151 C.F.
VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 213 C.F.
VOLUME PROVIDED AT POND 5 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calculations) = 9,101 C.F.
TOTAL = 9,465 C.F.

WATER QUALITY VOLUME AT BASIN 6

CONTRIBUTING IMPERVIOUS AREA = 38,223 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 38,223 S.F. = 1,593 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 2 CATCH BASINS = 101 C.F.
VOLUME PROVIDED FROM WATER QUALITY TANK (9'L x 6'H x 9'W) = 486 ft³ = 486 C.F.
VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 341 C.F.
VOLUME PROVIDED AT POND 6 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calculations) = 963 C.F.
TOTAL = 1,891 C.F.

WATER QUALITY VOLUME AT BASIN 7

CONTRIBUTING IMPERVIOUS AREA = 33,707 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 33,707 S.F. = 1,404 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 2 CATCH BASINS = 101 C.F.
VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 337 C.F.
VOLUME PROVIDED AT POND 7 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calculations) = 6,839 C.F.
TOTAL = 7,277 C.F.

WATER QUALITY VOLUME AT BASIN 8

CONTRIBUTING IMPERVIOUS AREA = 36,048 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 36,048 S.F. = 1,502 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 5 CATCH BASINS = 251 C.F.
VOLUME PROVIDED FROM WATER QUALITY TANK (9'L x 6'H x 9'W) = 486 ft³ = 486 C.F.
VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 371 C.F.
VOLUME PROVIDED AT POND 8 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calculations) = 1,428 C.F.
TOTAL = 2,536 C.F.



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WATER QUALITY VOLUME AT BASIN 8A

CONTRIBUTING IMPERVIOUS AREA = 24,780 S.F.
V(WQ) = 1 IN. X 24,780 S.F. = 2,065 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 4 CATCH BASINS = 201 C.F.

VOLUME PROVIDED FROM LEACHING CHAMBERS = 2,052 C.F.

TOTAL = 2,253 C.F.

WATER QUALITY VOLUME AT BASIN 9

CONTRIBUTING IMPERVIOUS AREA = 22,458 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 22,458 S.F. = 936 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 3 CATCH BASINS = 151 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 223 C.F.

VOLUME PROVIDED AT POND 9 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calculations) = 3,409 C.F.

TOTAL = 3,783 C.F.

WATER QUALITY VOLUME AT BASIN 10

CONTRIBUTING IMPERVIOUS AREA = 21,431 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 21,431 S.F. = 893 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 2 CATCH BASINS = 101 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 223 C.F.

VOLUME PROVIDED FROM WATER QUALITY TANK (3500 GALLON) = 468 ft³ = 468 C.F.

VOLUME PROVIDED FROM LEACHING CHAMBERS
(below lowest outlet) = 167 C.F.

TOTAL = 959 C.F.

WATER QUALITY VOLUME AT BASIN 11

CONTRIBUTING IMPERVIOUS AREA = 16,893 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 16,893 S.F. = 704 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 2 CATCH BASINS = 101 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 170 C.F.

VOLUME PROVIDED FROM WATER QUALITY TANK (3500 GALLON) = 468 ft³ = 468 C.F.

TOTAL = 739 C.F.

WATER QUALITY VOLUME AT BASIN 12

CONTRIBUTING IMPERVIOUS AREA = 21,657 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 21,657 S.F. = 902 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS
(3.14 x (2ft)² x 4ft) X 1 CATCH BASINS = 50 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 269 C.F.

VOLUME PROVIDED AT POND 12 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calculations) = 7,304 C.F.

TOTAL = 7,623 C.F.



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WATER QUALITY VOLUME AT BASIN 13

CONTRIBUTING IMPERVIOUS AREA = 13,236 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 13,236 S.F. = 552 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

(3.14 x (2ft)² x 4ft) X 2 CATCH BASINS = 101 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 230 C.F.

VOLUME PROVIDED AT POND 13 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 7,391 C.F.

TOTAL = 2,702 C.F.

WATER QUALITY VOLUME AT BASIN 14

CONTRIBUTING IMPERVIOUS AREA = 24,480 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 24,480 S.F. = 1,020 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

(3.14 x (2ft)² x 4ft) X 4 CATCH BASINS = 201 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 399 C.F.

VOLUME PROVIDED AT POND 14 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 8,045 C.F.

TOTAL = 8,645 C.F.

WATER QUALITY VOLUME AT BASIN 15

CONTRIBUTING IMPERVIOUS AREA = 2,724 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 2,724 S.F. = 114 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

(3.14 x (2ft)² x 4ft) X 1 CATCH BASINS = 50 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 267 C.F.

VOLUME PROVIDED AT POND 15 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 266 C.F.

TOTAL = 583 C.F.

WATER QUALITY VOLUME AT BASIN 16

CONTRIBUTING IMPERVIOUS AREA = 4,896 S.F.
V(WQ) = 0.5 IN. X 1 FT/ 12 IN. X 4,896 S.F. = 204 C.F.

VOLUME PROVIDED FROM DEEP SUMP HOODED CATCH BASINS

(3.14 x (2ft)² x 4ft) X 0 CATCH BASINS = 0 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY

(See Sediment Forebay Calculations) = 652 C.F.

VOLUME PROVIDED AT POND 16 (BELOW LOWEST OUTLET)

(See Groundwater Recharge Calculations) = 1,122 C.F.

TOTAL = 1,774 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #1

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 32,000 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 32,000 S.F.
= 267 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 266.00 AREA = 120 S.F.
FOREBAY BERM EL. = 267.50 AREA = 240 S.F.

VOLUME PROVIDED = 270 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #2

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 33,130 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 33,130 S.F.
= 276 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 273.50 AREA = 115 S.F.
FOREBAY BERM EL. = 275.00 AREA = 265 S.F.

VOLUME PROVIDED = 285 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #3

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 45,227 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

$$\begin{aligned} \text{REQ'D SED. FOREBAY VOLUME} &= .1" \text{ INCHES} \times \frac{1 \text{ FT}}{12 \text{ IN}} \times 45,227 \text{ S.F.} \\ &= 377 \text{ C.F.} \end{aligned}$$

PROVIDED VOLUME OF SEDIMENT FOREBAY

	BOTTOM FOREBAY EL. =	274.00	AREA =	107 S.F.
Forebay @ West side of basin	FOREBAY BERM EL. =	275.50	AREA =	228 S.F.

VOLUME PROVIDED = 251 C.F.

	BOTTOM FOREBAY EL. =	274.00	AREA =	39 S.F.
Forebay @ East side of basin	FOREBAY BERM EL. =	275.50	AREA =	130 S.F.

VOLUME PROVIDED = 127 C.F.

378 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #4

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 29,960 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 29,960 S.F.
= 250 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 272.50 AREA = 229 S.F.
FOREBAY BERM EL. = 273.50 AREA = 385 S.F.

VOLUME PROVIDED = 307 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #5

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 23,725 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 23,725 S.F.
= 198 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 271.00 AREA = 68 S.F.
FOREBAY BERM EL. = 272.50 AREA = 216 S.F.

VOLUME PROVIDED = 213 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #6

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 38,223 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 38,223 S.F.
= 319 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 265.00 AREA = 127 S.F.
FOREBAY BERM EL. = 266.50 AREA = 327 S.F.

VOLUME PROVIDED = 341 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #7

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 33,707 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 33,707 S.F.
= 281 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 260.50 AREA = 174 S.F.
FOREBAY BERM EL. = 261.90 AREA = 353 S.F.

VOLUME PROVIDED = 369 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #8

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 36,048 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 36,048 S.F.
= 300 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 265.00 AREA = 90 S.F.
FOREBAY BERM EL. = 267.00 AREA = 281 S.F.

VOLUME PROVIDED = 371 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #9

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 22,458 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 22,458 S.F.
= 187 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 270.50 AREA = 78 S.F.
FOREBAY BERM EL. = 272.00 AREA = 219 S.F.

VOLUME PROVIDED = 223 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR DET. BASIN #10

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 21,431 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 21,431 S.F.
= 179 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 270.00 AREA = 80 S.F.
FOREBAY BERM EL. = 271.50 AREA = 217 S.F.

VOLUME PROVIDED = 223 C.F.



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SEDIMENT FOREBAY SIZING CALCULATION FOR DET BASIN #11

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 16,893 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 16,893 S.F.
= 141 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 270.00 AREA = 29 S.F.
FOREBAY BERM EL. = 272.00 AREA = 141 S.F.

VOLUME PROVIDED = 170 C.F.



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CHECK BY:

C.J.V.
J.A.P.

DATE: 09/07/17
DATE: 09/07/17

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #12

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 21,657 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 21,657 S.F.
= 180 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 269.00 AREA = 105 S.F.
FOREBAY BERM EL. = 270.50 AREA = 253 S.F.

VOLUME PROVIDED = 269 C.F.



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JOB #: OE-2959
JOB NAME: Dr. Perkins Way
TOWN: Middleborough

CALC BY:
CHECK BY:

C.J.V.
J.A.P.

DATE: 09/07/17
DATE: 09/07/17

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #13

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 13,326 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 13,326 S.F.
= 111 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 274.00 AREA = 134 S.F.
FOREBAY BERM EL. = 275.00 AREA = 325 S.F.

VOLUME PROVIDED = 230 C.F.



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JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway

CALC BY:
CHECK BY:

K.A.D. DATE: 09/07/17
J.A.P. DATE: 09/07/17

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #14

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 24,480 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 24,480 S.F.
= 204 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 272.00 AREA = 94 S.F.
FOREBAY BERM EL. = 274.00 AREA = 305 S.F.

VOLUME PROVIDED = 399 C.F.



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JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway

CALC BY:
CHECK BY:

T.E.M. DATE: 09/06/17
J.A.P. DATE: 09/06/17

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #15

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 2,724 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 2,724 S.F.
= 23 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. = 264.00 AREA = 69 S.F.
FOREBAY BERM EL. = 265.50 AREA = 287 S.F.

VOLUME PROVIDED = 267 C.F.



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JOB NAME: Timber Crest Estates
TOWN: Medway

CALC BY:
CHECK BY:

T.E.M. DATE: 09/06/17
J.A.P. DATE: 09/06/17

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #16

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 4,896 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 4,896 S.F.
= 41 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAYS

BOTTOM FOREBAY EL. = 271.00 AREA = 116 S.F.
FOREBAY BERM EL. = 272.50 AREA = 550 S.F.

VOLUME PROVIDED = 500 C.F.



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JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway

CALC BY: CJV
CHECK BY: JAP
DATE: 9/6/17
DATE: 9/6/17

TSS REMOVAL CALCULATIONS

PRETREATMENT OF POND 1

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
<u>Total TSS Removal=</u>			0.44	

PRETREATMENT OF POND 2

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
<u>Total TSS Removal=</u>			0.44	

PRETREATMENT OF POND 3

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
<u>Total TSS Removal=</u>			0.44	

PRETREATMENT OF POND 4

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
<u>Total TSS Removal=</u>			0.44	

PRETREATMENT OF POND 5

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
<u>Total TSS Removal=</u>			0.44	



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DATE: 9/6/17

PRETREATMENT OF POND 6

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Water Quality Tank	25%	0.75	0.19	0.56
Sediment Forebay	25%	0.56	0.14	0.42
Total TSS Removal=			0.58	

PRETREATMENT OF POND 7

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 8

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 8A

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Leaching chambers	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 9

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 10

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Water Quality Tank	25%	0.75	0.19	0.56
Leaching Chambers	25%	0.56	0.14	0.42
Sediment Forebay	25%	0.42	0.11	0.32
Total TSS Removal=			0.68	



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TOWN: Medway

CALC BY: CJV
CHECK BY: JAP
DATE: 9/6/17
DATE: 9/6/17

PRETREATMENT OF POND 11

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Water Quality Tank	25%	0.75	0.19	0.56
Sediment Forebay	25%	0.56	0.14	0.42
Total TSS Removal=			0.58	

PRETREATMENT OF POND 12

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 13

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 14

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 15

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	

PRETREATMENT OF POND 16

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Sediment Forebay	25%	1.00	0.25	0.75
Sediment Forebay	25%	0.75	0.19	0.56
Total TSS Removal=			0.44	



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TREATMENT OF POND 1

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 2

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 3

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 4

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 5

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	



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DATE: 9/6/17
DATE: 9/6/17

TREATMENT OF POND 6

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 7

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 8

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 8A

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Leaching Chambers (with Pre-Treatment WQ tank)	80%	0.75	0.6	0.15
Det basin .	50%	0.15	0.075	0.075
Total TSS Removal=			0.93	

TREATMENT OF POND 9

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 10

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Leaching Chambers (with Pre-Treatment WQ tank)	80%	0.75	0.60	0.15
Extended Dry detention basin	50%	0.15	0.08	0.08
Total TSS Removal=			0.93	



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DATE: 9/6/17
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TREATMENT OF POND 11

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Street Sweeping	10%	1	0.1	0.9
Deep Sump Hooded Catch Basin	25%	0.9	0.225	0.675
Sed. Forebay	25%	0.68	0.17	0.51
Water Quality Tank	25%	0.51	0.13	0.38
Extended Dry detention basin	50%	0.38	0.19	0.19
Total TSS Removal=			0.81	

TREATMENT OF POND 12

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 13

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 14

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 15

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Deep Sump Hooded Catch Basin	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

TREATMENT OF POND 16

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Sediment Forebay	25%	1	0.25	0.75
Infiltration Basin (with Sediment Forebay)	80%	0.75	0.6	0.15
Total TSS Removal=			0.85	

Appendix G

Long-Term Pollution Prevention Plan (Standards #4-6)

This Long Term Pollution Prevention Plan serves to outline practices in order to prevent pollution of the wetland resource areas and surrounding environment.

It is anticipated that the town will eventually accept the roadways and be responsible for the Operation and Maintenance of the drainage systems upon completion. Prior to this event the developer and/or a Homeowners Association will be responsible. Please refer to the Conservation Permitting Plans (Sheet 2) for the Post-Development Operation and Maintenance schedule for the drainage system. This O & M Plan shall be adhered to by the Developer and his successors (see also Appendix H).

Snow disposal shall be carried out by the developer/owner or a contractor assigned this responsibility. The contractor should follow DEP guideline #BRPG 01-01 for all snow removal requirements. Snow shall be plowed and furrowed along the shoulders of the roadway, and shall not be placed in the drainage basins or any wetlands. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

In the event of a reportable quantity of oil, gasoline or other hazardous waste spill on-site, the Fire Department and DEP shall be notified immediately. Proper cleanup and disposal of hazardous wastes must follow all applicable local and state regulations and must be carried out by a qualified contractor.

The maintenance of all lawn and yard areas shall be performed by the individual homeowners. Minimal use of cleaning products and fertilizers is advised. Where homes are required to have roof drains, homeowners shall be responsible for maintenance also (refer to plans for more information on roof drains)

Appendix H

Long-Term Operation & Maintenance Plan and Log Form (Standard #9)

TIMBER CREST SUBDIVISION – Medway, MA

Operation & Maintenance Plan & Log Form

A) Construction Operation and Maintenance Schedule

The Operation and Maintenance (O&M) Schedule during the construction period is the responsibility of the Developer/Contractor. The project is subject to a NPDES Construction General Permit which shall be filed with EPA prior to commencing construction, and a Stormwater Pollution Prevention Plan (SWPPP) shall be prepared at that time that will cover detailed erosion controls and good housekeeping practices to prevent sedimentation and erosion into wetlands and other pollution prevention controls. The outline below is a general format that should be followed by the contractor/developer as closely as possible to ensure the proper construction and function of the drainage facilities. Refer to the project Phasing Plan for other construction requirements.

1. Erosion control silt fence to be placed at locations shown on the plans according to the Phasing Plan to minimize disturbance of the site; use double silt fence at all work limits within 50 ft. of any wetlands.
2. Minimum clearing should occur during the construction process. The limit of clearing is shown on the Grading & Drainage Plans and should be adhered to as closely as possible, with the only tree removal in areas necessary for each phase. It shall be the contractor's responsibility to determine the level of safety regarding standing trees.
3. In conjunction with subdivision roadway construction, the drainage system shall be constructed and side slopes stabilized as soon as possible (i.e. loam and seed, hydroseed, etc.). Once upslope areas are stabilized or it is determined that no sediment is entering the drainage system, they shall be cleaned free of fine sediment.
4. Silt fence, erosion control blankets, mulch and other erosion control materials should be placed at the bottom slopes of infiltration basin until they are stabilized, to prevent washouts and clogging of the bottom soils. Upon stabilization of upslope areas, the silt fence/erosion controls and accumulated sediment shall be removed and disposed offsite.
5. Drainage systems, road shoulders, and silt fence shall be inspected weekly and after heavy rains (over 1" rainfall) during construction. If there is sediment buildup observed in any drainage basin or along silt fence work limits, it shall be cleaned immediately.

TIMBER CREST SUBDIVISION – Medway, MA

B) Post-Construction Operation and Maintenance Schedule

It is anticipated that the town will eventually accept the roadways and be responsible for the Operation and Maintenance of the drainage systems upon completion. Prior to this event the developer and/or a Homeowners Association will be responsible. Please refer to the Conservation Permitting Plans (Sheet 2) for the Post-Development Operation and Maintenance schedule for the drainage system. This O & M Plan shall be adhered to by the Developer and his successors (see also Appendix H).

Snow disposal shall be carried out by the developer or town/contractor assigned this responsibility. The contractor should follow DEP guideline #BRPG 01-01 for all snow removal requirements. Snow shall be plowed and furrowed along the shoulders of all roadways, including the emergency access road between Road E cul de sac and Ohlson Circle, to ensure accessibility for emergency vehicle use. Snow shall not be placed in the drainage basins or any wetlands. Snow combined with sand and debris may block a storm drainage system, causing localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water.

Drainage Swales, Culverts and Roadways

Refer to the Inspection & Maintenance Form for required inspection and maintenance tasks to keep the drainage system in good working order, according to DEP Stormwater Management Regulations.

1. Street sweeping should be done each spring after final snow melt.
2. Catch basins and water quality tanks should be cleaned of sediment annually.
3. Detention and Infiltration Basins should be inspected annually to check for signs of erosion or prolonged standing water. Basins should be mowed twice per growing season to prevent woody vegetation growth. Sediment forebays should be inspected twice per year, and cleaned of sediment as necessary. Outlets and riprap shall be inspected on an annual basis and maintained in good working condition.
4. Underground leaching beds shall be inspected annually by viewing inspection ports to check for standing water or sediment.
5. Rain gardens and roof drains on individual lots shall be maintained by homeowners. For rain gardens, annual cleaning of dead vegetation and restoration of mulch are required.
6. Rain gardens on Open Space Parcels A and H shall be the responsibility of the town or a Homeowners Association. Annual cleaning of dead vegetation and restoration of mulch are required. Rain garden on Open Space A has a catch basin outlet that may require periodic cleaning.

**Timber Crest – West Side Drainage System
Operation & Maintenance Log Form**

SEDIMENT STRUCTURAL CONTROLS

CONTROL	DATE INSPECTED	SEDIMENT BUILDUP (YES/NO)	IF SEDIMENT BUILDUP, LIST DATE CLEANED. LIST OTHER MAINTENANCE REQUIRED OR PERFORMED.
Water Quality Swale @ lot 1			
Rain Garden on Open Space A			
Infiltration Basin 1			
Infiltration Basin 2			
Infiltration Basin 3			
Infiltration Basin 4			
Infiltration Basin 5			
Infiltration Basin 6			

OTHER REQUIRED MAINTENANCE:

TO BE PERFORMED BY: _____

ON OR BEFORE: _____

Timber Crest – East Side Drainage System

Operation & Maintenance Log Form

SEDIMENT STRUCTURAL CONTROLS

CONTROL	DATE INSPECTED	SEDIMENT BUILDUP (YES/NO)	IF SEDIMENT BUILDUP, LIST DATE CLEANED. LIST OTHER MAINTENANCE REQUIRED OR PERFORMED.
Rain Garden on Open Space H			
Infiltration Basin 7			
Infiltration Basin 8			
Leaching Bed and Detention Basin 8A			
Infiltration Basin 9			
Leaching Bed and Detention Basin 10			
Detention Basin 11			
Infiltration Basin 12			
Infiltration Basin 13			
Infiltration Basin 14			
Infiltration Basin 15			
Infiltration Basin 16			

OTHER REQUIRED MAINTENANCE:

TO BE PERFORMED BY: _____

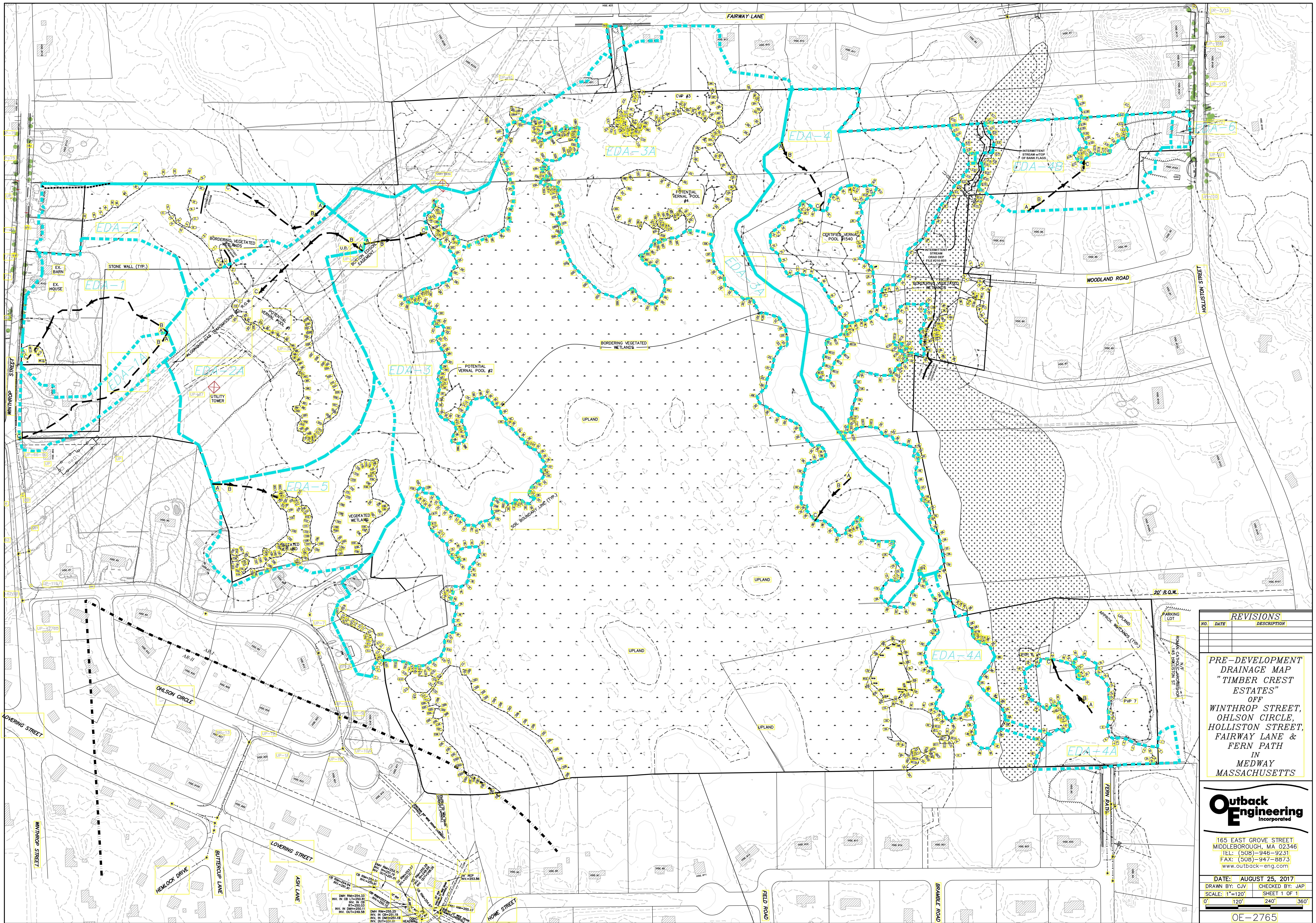
ON OR BEFORE: _____

Appendix I
Illicit Discharge Statement (Standard #10)

The project does not have any illicit discharges to any of the stormwater management facilities as shown on the plans of the submittal.

James A. Pavlik, P.E.
Project Manager

Appendix J
Pre- and Post-Development Drainage Maps



REVISIONS		
NO.	DATE	DESCRIPTION

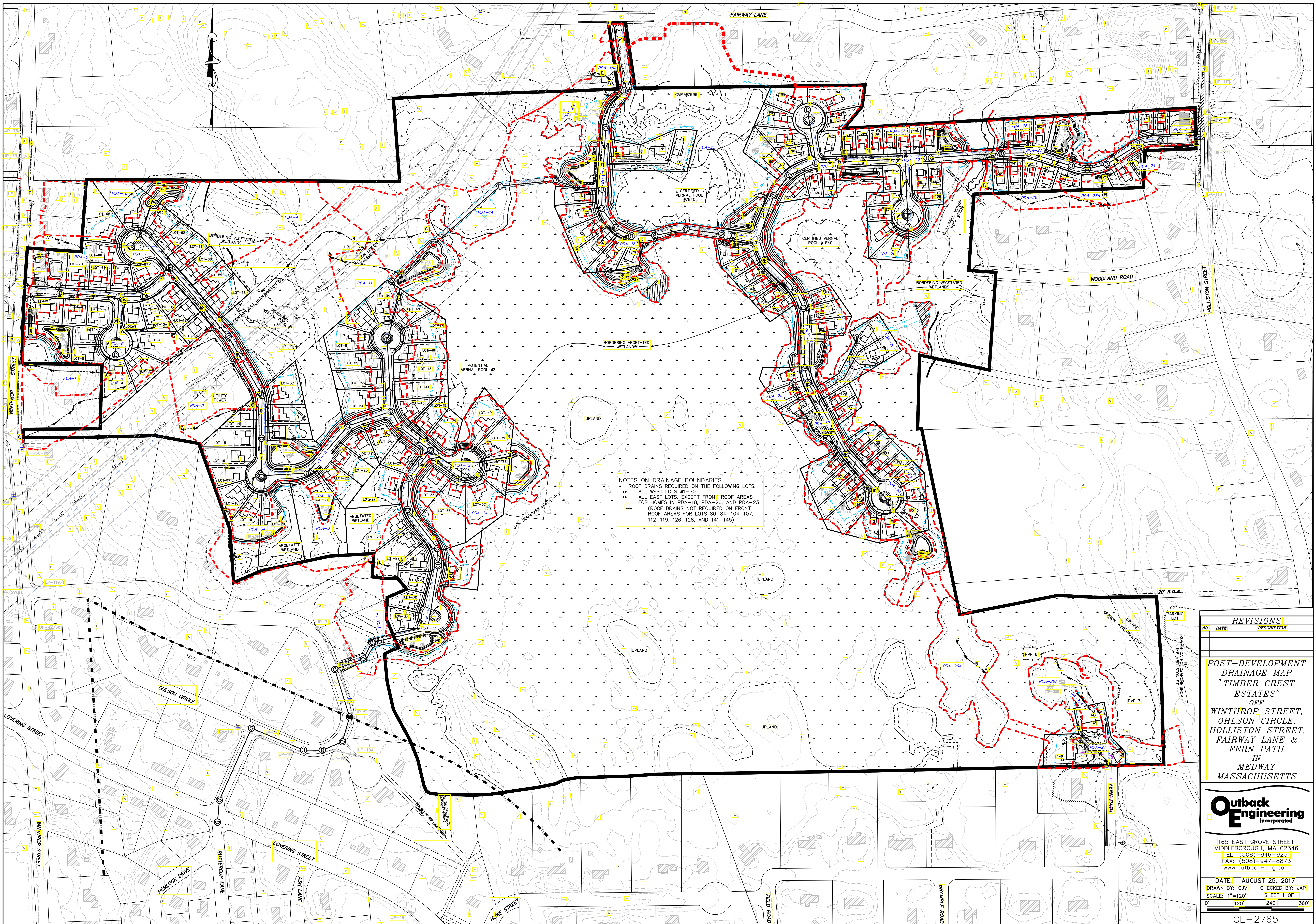
PRE-DEVELOPMENT DRAINAGE MAP
"TIMBER CREST ESTATES"
OFF
WINTHROP STREET,
OHLSON CIRCLE,
HOLLISTON STREET,
FAIRWAY LANE &
FERN PATH
IN
MEDWAY
MASSACHUSETTS

Outback Engineering
Incorporated

165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: AUGUST 25, 2017
DRAWN BY: CJV CHECKED BY: JAP
SCALE: 1"=120' SHEET 1 OF 1
0' 120' 240' 360'

OE-2765



NOTES ON DRAINAGE BOUNDARIES

- ROOF DRAINS REQUIRED ON THE FOLLOWING LOTS:
 - ALL WEST LOTS #1-70
 - ALL EAST LOTS, EXCEPT FRONT ROOF AREAS FOR HOMES IN PDA-18, PDA-20, AND PDA-23 (ROOF DRAINS NOT REQUIRED ON FRONT ROOF AREAS FOR LOTS 80-84, 104-107, 112-119, 126-128, AND 141-145)

REVISIONS	
NO.	DATE

POST-DEVELOPMENT DRAINAGE MAP
"TIMBER CREST ESTATES"
OFF
WINTHROP STREET,
OHLSON CIRCLE,
HOLLISTON STREET,
FAIRWAY LANE &
FERN PATH
IN
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