DRAINAGE REPORT

"Timber Crest Estates"
Medway, MA

September 7, 2017
Revised March 15, 2018

Prepared for:
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COMMONWEALTH OF MASSACHUSETTS
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REGISTERED PROFESSIONAL ENGINEER

James A. Pavlik
3-27-18

DRAINAGE REPORT
"TIMBER CREST ESTATES"
MEDWAY, MASSACHUSETTS

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Appendices

DRAINAGE REPORT
"TIMBER CREST ESTATES"
MEDWAY, MASSACHUSETTS
September 7, 2017
Revised March 15, 2018

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 on approximately 170 acres in the north section of Medway. Conservation Permitting Plans dated August 25, 2017, last revised March 15, 2018, show the proposed project in detail, based upon a Comprehensive Permit per MGL Ch. 40B issued by the Medway Zoning Board of Appeals and latest comments from the Conservation Commission. 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.

These drainage calculations have been revised per Outback Engineering's letter dated March 26, 2018, responding to comments dated February 6, 2018, from Tetra Tech, the Commission's consulting engineer. The revised Plans include significant site layout changes where the applicant has an agreement to purchase an easement at 13 Fairway Lane to provide an emergency access road that will result in a tremendous reduction in wetland impacts, among other improvements. The major changes include the following:

- With the easement at #13 Fairway Lane, an emergency access road is proposed to connect Fairway Lane with the cul-de-sac on Road H (this allows the elimination of Road I as noted below). On the property, there is a small bordering vegetated wetland with a catch basin piped to the Fairway Lane drainage system. The work associated with this emergency access will be permitted via a separate Notice of Intent filing. We note this work will have no effect on the Timer Crest Estates drainage system, as the house lot and proposed work drains to the CB noted above, separate from any of the Timber Crest drainage areas.
- Road I has been eliminated and replaced with a common driveway to service four proposed homes off Fairway Lane. This eliminates 3,644 s.f. of wetland alteration associated with the former roadway at Wetland Crossing #2, and will preserve a significant area of upland trees surrounding vernal pools. It also reduces the total house lots in the project from 147 to 143, thereby reducing impervious coverage and work within the buffer zones.
- Road F has been redesigned to use a bridge to span the intermittent stream at Wetland Crossing #3. This eliminates 570 s.f. of wetland alteration, and reduces permanent wetland fill to only 1,290 s.f.

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 portion of the site to be developed 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 four certified vernal pools in the northeast portion of the site and three 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 central portion 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 drainage 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 L for the Pre-Development Watershed Plan.

Section 3.0: Proposed Development

Timber Crest Estates is a subdivision with two separate neighborhoods, referred to as the West Side and East Side, planned to preserve wetlands and upland areas between them as open space. The project consists of 143 homes, including 70 single family homes on the West Side and 73 single-family homes on the East Side. The subdivision roadway entrance for the West Side is off of Winthrop Street directly opposite from Stephanie Road; this road ends in a cul de sac with an emergency access connecting to Ohlson Circle. The subdivision roadway entrance for the East Side is off of Holliston Street at existing house #165, and an emergency access road will connect Road H to Fairway Lane at existing house #13 (this emergency access will be permitted under a separate Notice of Intent with its own drainage design). The east side also includes a common driveway between 19 and 21 Fairway Lane to access four proposed house lots, as well as a common drive for two lots 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.

A permanent wetland crossing with a bridge to span an intermittent stream is required to build the roads on the East Side, and a crossing with a box culvert over an intermittent stream is planned for an emergency access road behind 13 Ohlson Circle. Three wetland crossings are planned to connect town water and sewer mains between the East and West Side subdivisions, using Horizontal Directional Drilling to eliminate wetland alteration.

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 two dry detention basins are proposed to control site runoff; there are also two underground leaching chamber beds, two water quality swales, and 5 rain gardens.
- 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 two proposed homes at the end of Fern Path and four homes with common driveway off Fairway Lane, incorporate a T-turnaround for emergency vehicles (instead of a large paved cul de sac). These driveways use shallow grassed swales and infiltration basins, 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 either a detention basin, infiltration basin, chamber bed, or

water quality swale which will treat, store and either infiltrate the runoff or slowly release it at a reduced flow rate from existing conditions. Where possible much of the runoff will be recharged into the underlying soil (via roof drains, leaching beds, infiltration basins, and rain gardens) 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 L for the watershed map.

Section 4.0: Drainage Design Methodology

To determine changes in stormwater 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, 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.

This project is subject to a NPDES General Construction Permit. A draft Storm Water Pollution Prevention Plan (SWPPP), detailing erosion control and other construction-period operation and maintenance protocols, has been prepared to comply with Standard 8 of the DEP Stormwater Management Regulations.

Section 5.0: Summary of Results

In accordance with DEP requirements, the storm water design controls runoff rate for the 2-year, 10-year, and 100-year storm events (and also the 25-year storm as requested by the Conservation Commission) below existing conditions as well as offsite flooding in the 100-year storm. 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

	Pre development	**Post development**
	Rate/Volume	Rate/Volume
2 Year Storm (3.20”) • To Design Point 1	0.32 cfs 0.077 af	0.28 cfs 0.043 af
10 Year Storm (4.70”) • To Design Point 1	3.48 cfs 0.480 af	2.85 cfs 0.399 af
25 Year Storm (5.50”) • To Design Point 1	7.27 cfs 0.756 af	5.97 cfs 0.648 af
100 Year Storm (6.70”) • To Design Point 1	12.68 cfs 1.228 af	11.34 cfs 1.085 af

Design Point 2 – To Intermittent Stream Flowing Offsite Northwest

	Pre development	**Post development**
	Rate	Rate
2 Year Storm (3.20”) • To Design Point 2	0.70 cfs 0.140 af	0.48 cfs 0.104 af
10 Year Storm (4.70”) • To Design Point 2	3.84 cfs 0.447 af	2.85 cfs 0.348 af
25 Year Storm (5.50”) • To Design Point 2	6.26 cfs 0.794 af	4.81 cfs 0.545 af
100 Year Storm (6.70”) • 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

	Pre development	**Post development**
	Rate	Rate
2 Year Storm (3.20”) • To Design Point 3	1.65 cfs 0.394 af	1.23 cfs 0.448 af
10 Year Storm (4.70”) • To Design Point 3	9.47 cfs 1.43 af	6.22 cfs 1.499 af
25 Year Storm (5.50”)		

• To Design Point 3	15.77 cfs 2.245 af	10.18 cfs 2.284 af
100 Year Storm (6.70") • To Design Point 3	29.08 cfs 3.735 af	17.92 cfs 3.687 af

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

	Pre development	**Post development**
	Rate	Rate
2 Year Storm (3.20") • To Design Point 4	3.15 cfs 0.418 af	2.54 cfs 0.386 af
10 Year Storm (4.70") • To Design Point 4	8.67 cfs 1.177 af	7.83 cfs 1.107 af
25 Year Storm (5.50") • To Design Point 4	13.75 cfs 1.727 af	12.84 cfs 1.652 af
100 Year Storm (6.70") • To Design Point 4	23.17 cfs 2.711 af	22.01 cfs 2.577 af

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

	Pre development	**Post development**
	Rate	Rate
2 Year Storm (3.20") • To Design Point 5	0.00 cfs 0.00 af	0.00 cfs 0.00 af
10 Year Storm (4.70") • To Design Point 5	0.00 cfs 0.00 af	0.00 cfs 0.001 af
25 Year Storm (5.50") • To Design Point 5	0.02 cfs 0.016 af	0.02 cfs 0.017 af
100 Year Storm (6.70") • To Design Point 5	0.14 cfs 0.089 af	0.12 cfs 0.074 af

Section 6.0: The Stormwater Management Standards

This section documents compliance with DEP's 10 Stormwater Management Standards.

1. *No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

   The proposed stormwater conveyances do not discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth. See Appendix C.

2. *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.*

Infiltration basins, detention basins, leaching chamber beds, rain gardens, and water quality swales have been incorporated into the storm water design to control runoff rates for the 2, 10, 25, and 100-year storm events. Five design points have been analyzed: (1) flow to wetland & low area at Winthrop St., (2) flow to intermittent stream flowing offsite northeast, (3) flow to central wetlands flowing to Lovering St., (4) flow to east wetlands flowing to Fairway Lane culvert, and (5) flow to onsite isolated wetlands north of Ohlson Cir. Peak flow rates have been reduced in all cases from pre- to post-development. Offsite flooding for the 100-year storm has also been reduced at all design points, by recharging runoff so that post-development runoff volumes are below existing conditions. See summary of results in Section 5, as well as the HydroCAD calculations in Appendices D-1 and D-2.

3. *Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

Infiltration basins and leaching chamber beds have been designed to recharge more than three times the required recharge volume of storm water for the site. The required recharge volume has been calculated using the simple dynamic method. These calculations as well as drawdown calculations for all infiltration BMPs have been provided in Appendix E.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:*

a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;

b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

The storm water management system for this project has been designed to remove a minimum of 80% of the average annual post construction load of total suspended solids in accordance with this standard. This standard has been met as noted below.

(a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan (see Appendix I).
(b) The structural BMP treatment trains utilized will capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook (see Appendix F-1).

(c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook using deep sump catch basins, sediment forebays, and water quality tanks (see Appendices F-2 to F-4).

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.*

The site is not a source of higher pollutant loads. This standard is not applicable.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.*

Portions of the site discharge to a number of Vernal Pools. Source control and pollution prevention measures, along with specific structural storm water BMPs determined by the Department to be suitable for managing discharges to critical areas, as provided in the Massachusetts Stormwater Handbook, have been incorporated in the drainage design of the site. For discharges to ORWs such as vernal pools deep sump catch basins, sediment forebays, and water quality tanks are recommended structural pretreatment BMPs, and infiltration basins are highly recommended infiltration BMPs.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

The site is not a redevelopment project. This standard is not applicable.

8. *A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.*

General construction sequencing and erosion control requirements are shown on the plans. Additional erosion and sediment controls and other pollutant source controls for the construction period are provided in a SWPPP that is under separate cover; the SWPPP

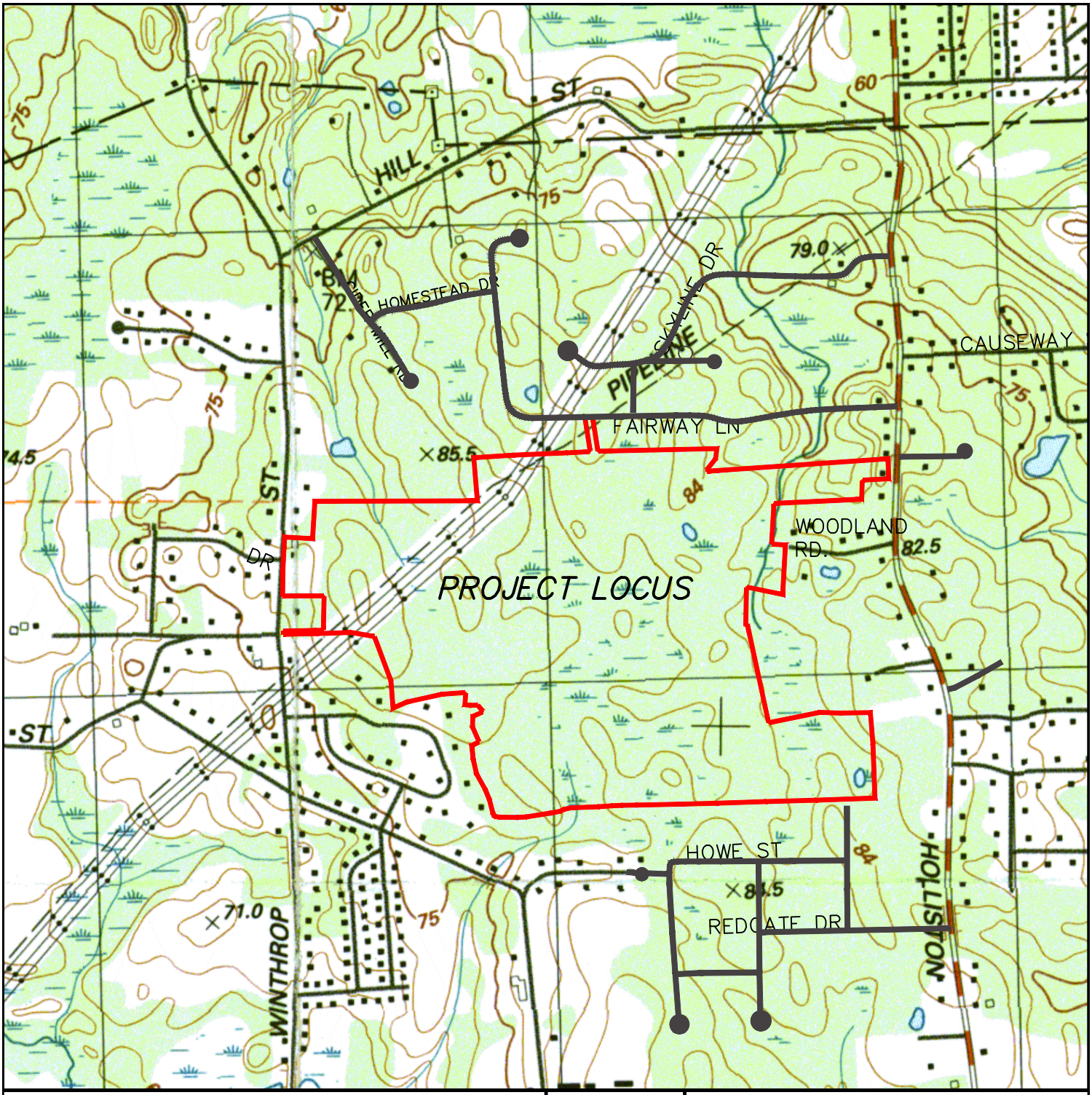
includes a detailed Erosion and Sediment Control Plan and identifies responsible parties to maintain the controls. Temporary sediment basins have been sized according to DEP Guidance on Erosion Controls. Prior to construction, this SWPPP shall be updated with contractor information along with the EPA NPDES General Permit filing. This standard has been met.

9. *A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.*

   A general Operation and Maintenance Plan is provided on sheet 2 of the plans. A more detailed Long-Term O&M plan describing inspection and maintenance schedules for each drainage BMP with an O&M Log Sheet is provided in Appendix J. This standard has been met.

10. *All illicit discharges to the stormwater management system are prohibited.*

    Appendix K contains a signed Illicit Discharge Statement. This standard has been met.



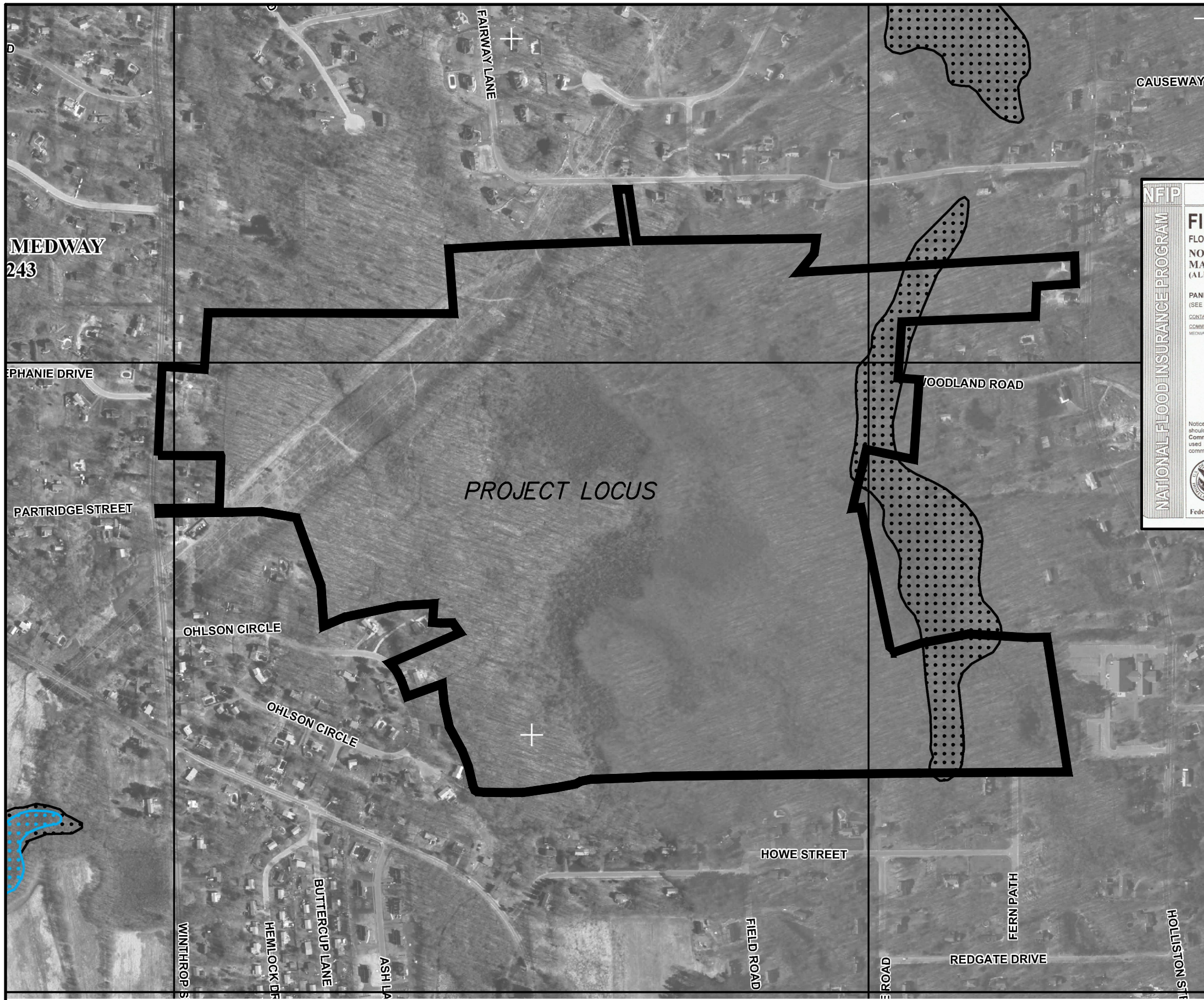
USGS LOCUS MAP
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: USGS MAP

FEET 0 1000 2000 3000
SCALE: 1"=1000'

MAGNETIC

Outback Engineering Incorporated

165 EAST GROVE STREET
MIDDLEBOROUGH, MASS. 02346
TEL 508-946-9231



NFIP

NATIONAL FLOOD INSURANCE PROGRAM

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

EFFECTIVE DATE
JULY 17, 2012

Federal Emergency Management Agency

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

Outback Engineering Incorporated

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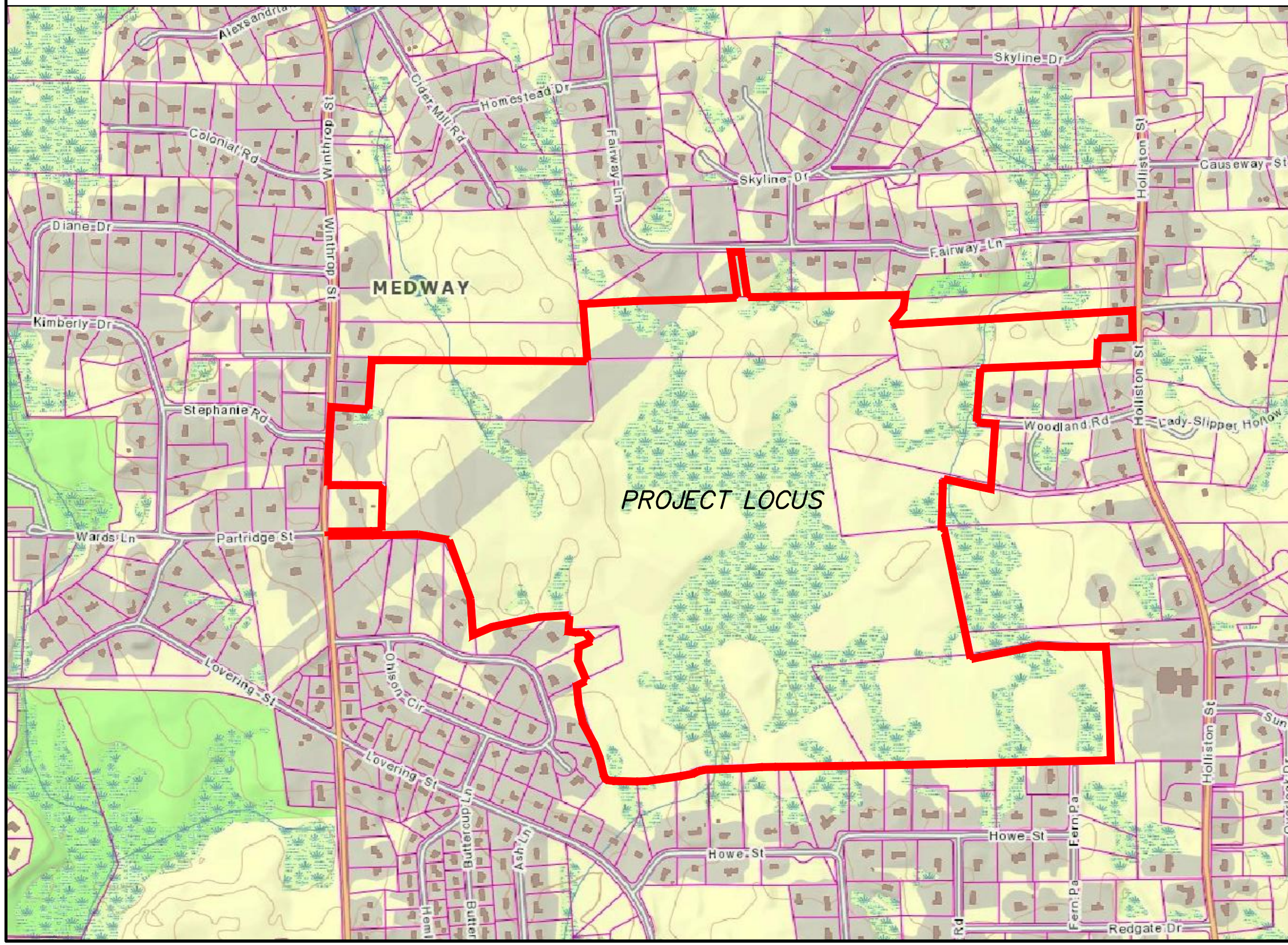
MIDDLEBOROUGH, MASS. 02346
TEL 508-946-9231

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

FEET 0 500 1000 1500

SCALE: 1"=500'



Legend

Areas of Critical Environmental Concern ACECs

MAGNETIC

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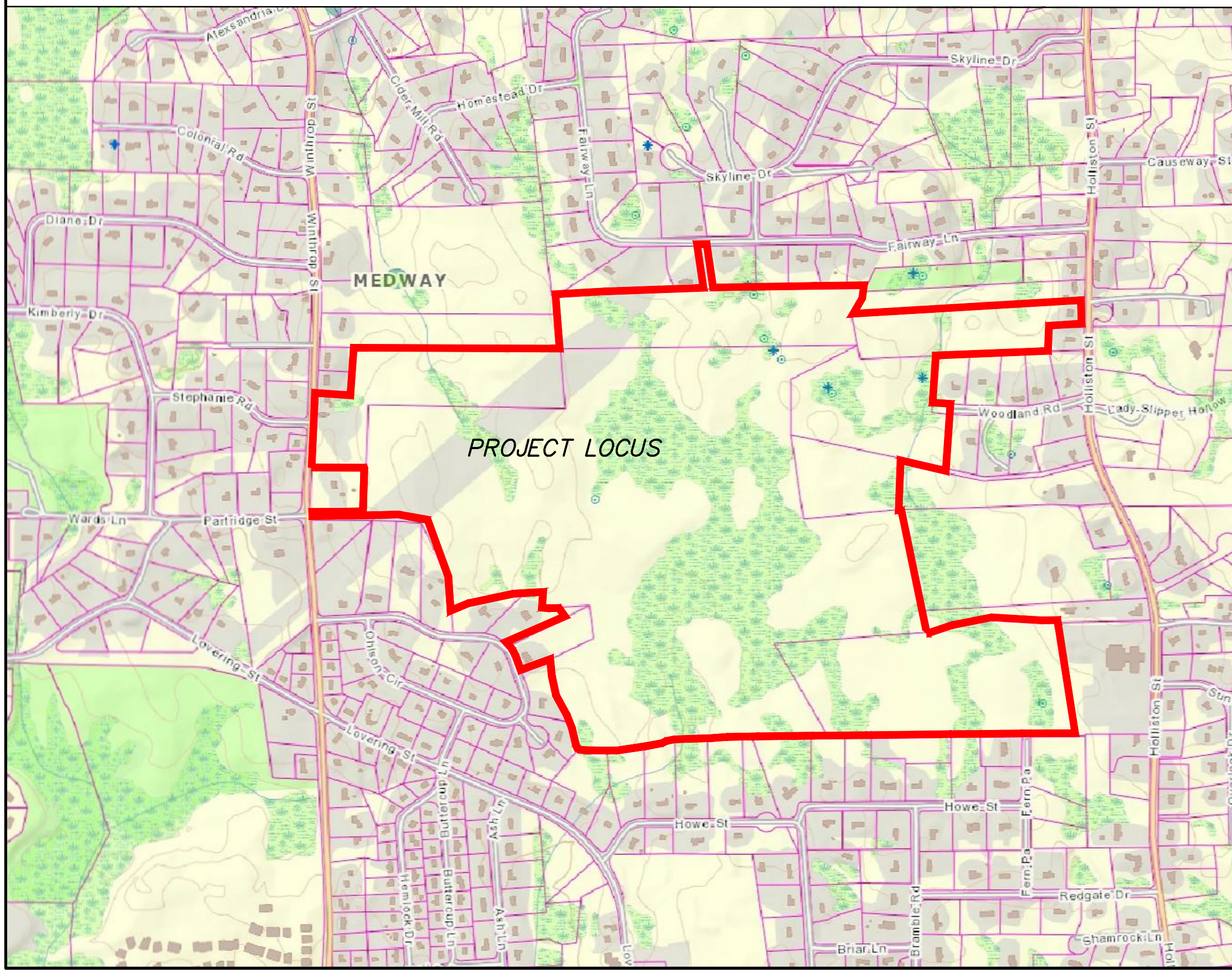
AREAS OF CRITICAL AND ENVIRONMENTAL CONCERN
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: MASSGIS

FEET 0 600 1200 1800

SCALE: 1"=600'



Legend

Potential Vernal Pools

NHESP Priority Habitats of Rare Species

NHESP Estimated Habitats of Rare Wildlife

NHESP Certified Vernal Pools

Tax Parcels for Query

Outback Engineering Incorporated

165 EAST GROVE STREET
MIDDLEBOROUGH, MASS. 02346
TEL 508-946-9231

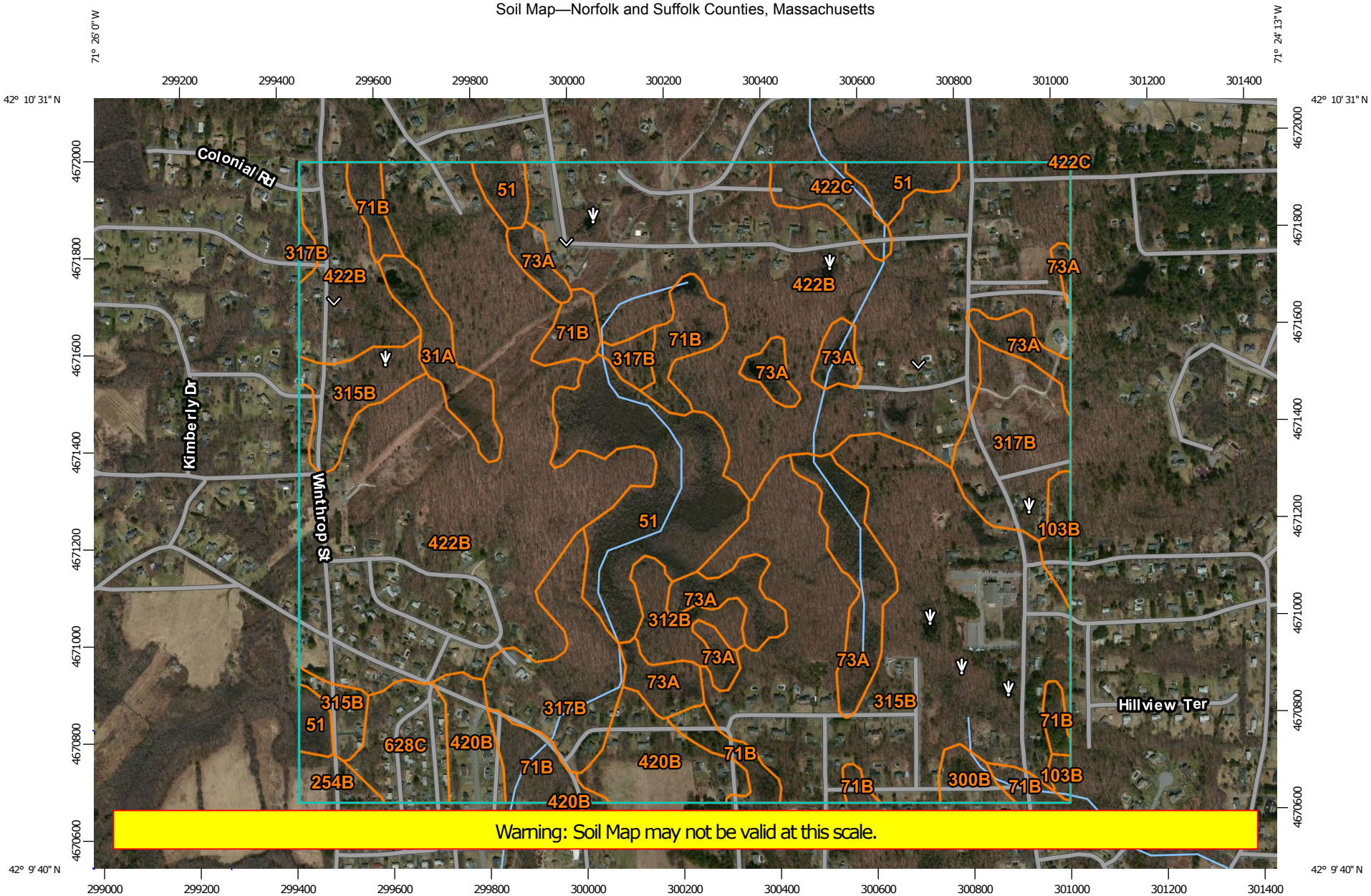
NATURAL HERITAGE MAP
"TIMBER CREST ESTATES"
MEDWAY, MASS.
SOURCE: 2008 MAPPING BY
NHESP OF THE
MASSACHUSETTS DIVISIONS
OF FISHERIES AND WILDLIFE

FEET 0 600 1200 1800

SCALE: 1"=600'

Appendix A

NRCS Soil characteristics for on-site soils



Map Scale: 1:11,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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

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

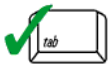
DEP Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

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 8[2]
- 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.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

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

COMMONWEALTH OF MASSACHUSETTS
JAMES A. PAVLIK
CIVIL
No. 36488
REGISTERED PROFESSIONAL ENGINEER

James A. Pavlik

Signature and Date 3-27-18

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 Field[1]

☐ 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 **CALC BY:** CJV **DATE:** 3/15/18
JOB NAME: Timber Crest Estates **CHECK BY:** J.A.P **DATE:** 3/15/18
TOWN: Medway

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.

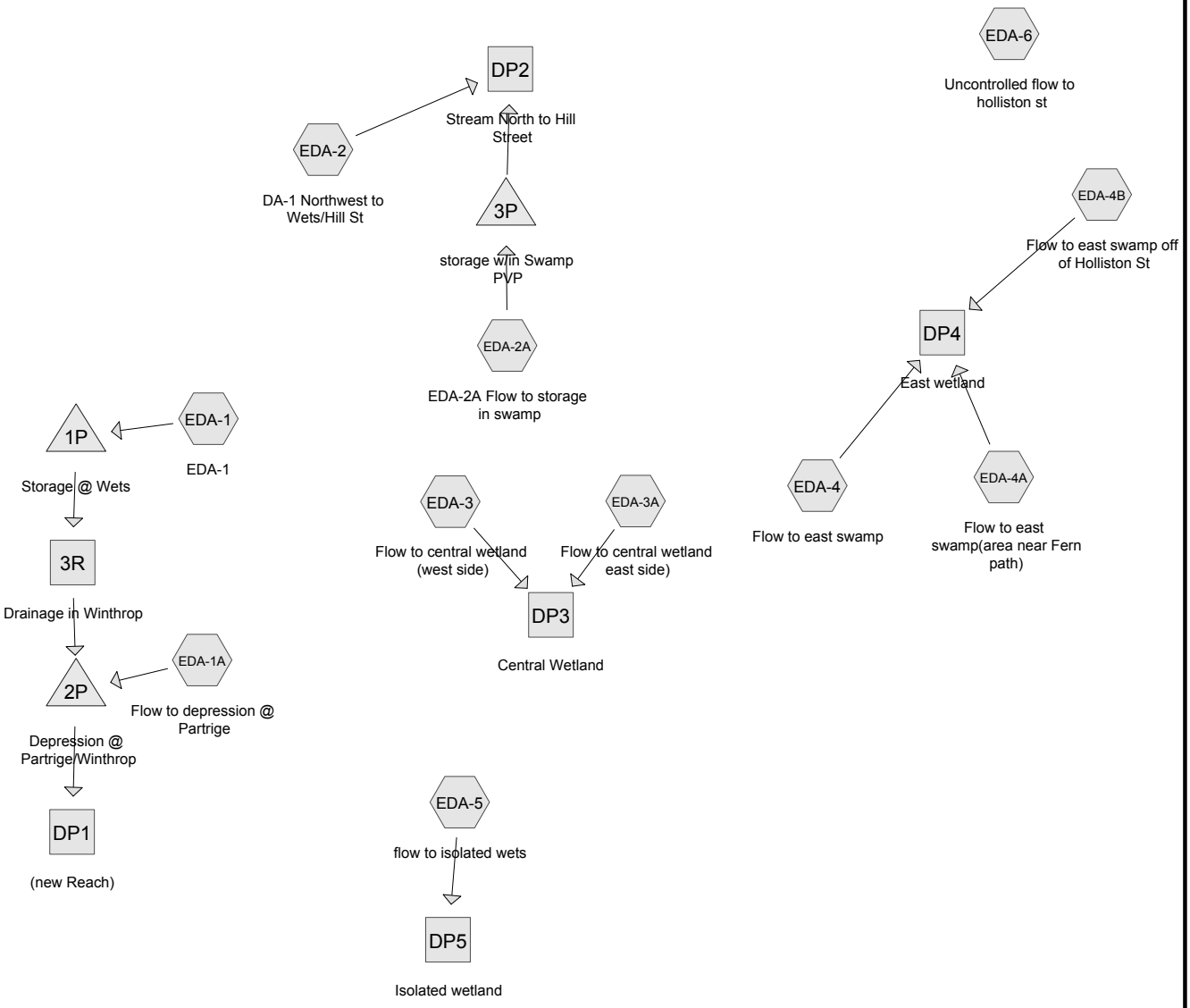
Maximum Discharge Velocity & Ability of Ground Surface to Resist Erosion:

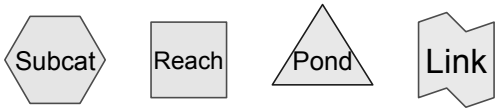
Discharge Outlet	Max. Discharge Velocity (ft/s)*	Receiving Groundcover	Receiving Slope	Permissible Velocity (ft/s)**	Suitability
6" Orifice @ Det Basin 1	3.85	Lawn	1%	5	O.K.
4" Orifice @ Infil. Basin #2	5.14	Lawn	2%	5	Requires Ground Armouring
2" Orifice @ Infil. Basin #6	1.85	Lawn	2%	5	O.K.
6" Orifice @ Infil. Basin #8	5.07	Lawn	4%	5	Requires Ground Armouring
4" Orifice @ Det. Basin #8A	7.52	Lawn	1%	5	Requires Ground Armouring
(2) 4" Orifice @ Infil. Basin #9	2.85	Lawn	5%	5	O.K.
2" Orifice @ Det. Basin #10	1.83	Lawn	2%	5	O.K.
12" Culvert @ Infil. Basin #14	4.26	Lawn	2%	5	O.K.
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 3/28/2018
HydroCAD® 10.00 s/n 01105 © 2013 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**

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=253,893 sf 5.78% Impervious Runoff Depth=0.41"
Flow Length=410' Tc=18.5 min CN=60 Runoff=1.19 cfs 0.198 af

Subcatchment EDA-1A: Flow to Runoff Area=90,949 sf 12.28% Impervious Runoff Depth=0.13"
Flow Length=700' Tc=20.9 min CN=50 Runoff=0.04 cfs 0.022 af

Subcatchment EDA-2: DA-1 Northwest to Runoff Area=262,052 sf 1.98% Impervious Runoff Depth=0.28"
Flow Length=450' Tc=13.3 min CN=56 Runoff=0.70 cfs 0.140 af

Subcatchment EDA-2A: EDA-2A Flow to Runoff Area=525,669 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=470' Tc=21.7 min CN=44 Runoff=0.05 cfs 0.032 af

Subcatchment EDA-3: Flow to central Runoff Area=680,802 sf 1.42% Impervious Runoff Depth=0.00"
Flow Length=237' Tc=14.2 min CN=37 Runoff=0.00 cfs 0.000 af

Subcatchment EDA-3A: Flow to central Runoff Area=820,784 sf 2.23% Impervious Runoff Depth=0.25"
Flow Length=208' Tc=19.6 min CN=55 Runoff=1.65 cfs 0.394 af

Subcatchment EDA-4: Flow to east swamp Runoff Area=531,965 sf 0.00% Impervious Runoff Depth=0.06"
Flow Length=320' Tc=15.3 min CN=46 Runoff=0.09 cfs 0.059 af

Subcatchment EDA-4A: Flow to east Runoff Area=213,749 sf 0.00% Impervious Runoff Depth=0.88"
Flow Length=230' Slope=0.0150 '/' Tc=18.7 min CN=71 Runoff=3.15 cfs 0.359 af

Subcatchment EDA-4B: Flow to east Runoff Area=191,650 sf 0.39% Impervious Runoff Depth=0.00"
Flow Length=283' Tc=17.4 min CN=32 Runoff=0.00 cfs 0.000 af

Subcatchment EDA-5: flow to isolated wets Runoff Area=284,124 sf 0.07% Impervious Runoff Depth=0.00"
Flow Length=260' Tc=17.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment EDA-6: Uncontrolled flow to Runoff Area=8,799 sf 20.67% Impervious Runoff Depth=0.31"
Flow Length=50' Slope=0.0200 '/' Tc=5.6 min UI Adjusted CN=57 Runoff=0.03 cfs 0.005 af

Reach 3R: Drainage in Winthrop Inflow=0.30 cfs 0.059 af
Outflow=0.30 cfs 0.059 af

Reach DP1: (new Reach) Inflow=0.33 cfs 0.077 af
Outflow=0.33 cfs 0.077 af

Reach DP2: Stream North to Hill Street Inflow=0.70 cfs 0.140 af
Outflow=0.70 cfs 0.140 af

Reach DP3: Central Wetland Inflow=1.65 cfs 0.394 af
Outflow=1.65 cfs 0.394 af

Reach DP4: East wetland Inflow=3.15 cfs 0.418 af
Outflow=3.15 cfs 0.418 af

Reach DP5: Isolated wetland Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Storage @ Wets Peak Elev=260.05' Storage=2,429 cf Inflow=1.19 cfs 0.198 af
Discarded=0.10 cfs 0.125 af Primary=0.30 cfs 0.059 af Outflow=0.40 cfs 0.184 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=254.50' Storage=32 cf Inflow=0.34 cfs 0.082 af
Discarded=0.01 cfs 0.005 af Primary=0.33 cfs 0.077 af Outflow=0.34 cfs 0.082 af

Pond 3P: storage w/in Swamp PVP Peak Elev=274.05' Storage=1,402 cf Inflow=0.05 cfs 0.032 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 88.715 ac Runoff Volume = 1.210 af Average Runoff Depth = 0.16"
98.40% Pervious = 87.297 ac 1.60% Impervious = 1.419 ac

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 @ Partrige

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)

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

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

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

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

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)

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

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

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

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

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 @ Partrige/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)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=253,893 sf 5.78% Impervious Runoff Depth=1.13"
Flow Length=410' Tc=18.5 min CN=60 Runoff=4.63 cfs 0.549 af

Subcatchment EDA-1A: Flow to Runoff Area=90,949 sf 12.28% Impervious Runoff Depth=0.57"
Flow Length=700' Tc=20.9 min CN=50 Runoff=0.56 cfs 0.100 af

Subcatchment EDA-2: DA-1 Northwest to Runoff Area=262,052 sf 1.98% Impervious Runoff Depth=0.89"
Flow Length=450' Tc=13.3 min CN=56 Runoff=3.84 cfs 0.447 af

Subcatchment EDA-2A: EDA-2A Flow to Runoff Area=525,669 sf 0.00% Impervious Runoff Depth=0.31"
Flow Length=470' Tc=21.7 min CN=44 Runoff=1.09 cfs 0.314 af

Subcatchment EDA-3: Flow to central Runoff Area=680,802 sf 1.42% Impervious Runoff Depth=0.09"
Flow Length=237' Tc=14.2 min CN=37 Runoff=0.19 cfs 0.119 af

Subcatchment EDA-3A: Flow to central Runoff Area=820,784 sf 2.23% Impervious Runoff Depth=0.83"
Flow Length=208' Tc=19.6 min CN=55 Runoff=9.47 cfs 1.311 af

Subcatchment EDA-4: Flow to east swamp Runoff Area=531,965 sf 0.00% Impervious Runoff Depth=0.39"
Flow Length=320' Tc=15.3 min CN=46 Runoff=1.88 cfs 0.400 af

Subcatchment EDA-4A: Flow to east Runoff Area=213,749 sf 0.00% Impervious Runoff Depth=1.89"
Flow Length=230' Slope=0.0150 '/' Tc=18.7 min CN=71 Runoff=7.35 cfs 0.774 af

Subcatchment EDA-4B: Flow to east Runoff Area=191,650 sf 0.39% Impervious Runoff Depth=0.01"
Flow Length=283' Tc=17.4 min CN=32 Runoff=0.01 cfs 0.003 af

Subcatchment EDA-5: flow to isolated wets Runoff Area=284,124 sf 0.07% Impervious Runoff Depth=0.00"
Flow Length=260' Tc=17.2 min CN=30 Runoff=0.00 cfs 0.000 af

Subcatchment EDA-6: Uncontrolled flow to Runoff Area=8,799 sf 20.67% Impervious Runoff Depth=0.95"
Flow Length=50' Slope=0.0200 '/' Tc=5.6 min UI Adjusted CN=57 Runoff=0.18 cfs 0.016 af

Reach 3R: Drainage in Winthrop Inflow=3.89 cfs 0.396 af
Outflow=3.89 cfs 0.396 af

Reach DP1: (new Reach) Inflow=3.42 cfs 0.480 af
Outflow=3.42 cfs 0.480 af

Reach DP2: Stream North to Hill Street Inflow=3.84 cfs 0.447 af
Outflow=3.84 cfs 0.447 af

Reach DP3: Central Wetland Inflow=9.47 cfs 1.430 af
Outflow=9.47 cfs 1.430 af

Reach DP4: East wetland Inflow=8.67 cfs 1.177 af
Outflow=8.67 cfs 1.177 af

Reach DP5: Isolated wetland Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Storage @ Wets Peak Elev=260.28' Storage=3,524 cf Inflow=4.63 cfs 0.549 af
Discarded=0.12 cfs 0.135 af Primary=3.89 cfs 0.396 af Outflow=4.01 cfs 0.531 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=255.75' Storage=1,365 cf Inflow=4.45 cfs 0.496 af
Discarded=0.13 cfs 0.016 af Primary=3.42 cfs 0.480 af Outflow=3.55 cfs 0.496 af

Pond 3P: storage w/in Swamp PVP Peak Elev=274.39' Storage=13,664 cf Inflow=1.09 cfs 0.314 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 88.715 ac Runoff Volume = 4.031 af Average Runoff Depth = 0.55"
98.40% Pervious = 87.297 ac 1.60% Impervious = 1.419 ac

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 @ Partrige

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

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

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)

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

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

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

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

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)

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 @ Partrige/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 '/' 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=0.13 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)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=253,893 sf 5.78% Impervious Runoff Depth=1.60"
Flow Length=410' Tc=18.5 min CN=60 Runoff=6.96 cfs 0.778 af

Subcatchment EDA-1A: Flow to Runoff Area=90,949 sf 12.28% Impervious Runoff Depth=0.91"
Flow Length=700' Tc=20.9 min CN=50 Runoff=1.07 cfs 0.158 af

Subcatchment EDA-2: DA-1 Northwest to Runoff Area=262,052 sf 1.98% Impervious Runoff Depth=1.31"
Flow Length=450' Tc=13.3 min CN=56 Runoff=6.26 cfs 0.656 af

Subcatchment EDA-2A: EDA-2A Flow to Runoff Area=525,669 sf 0.00% Impervious Runoff Depth=0.56"
Flow Length=470' Tc=21.7 min CN=44 Runoff=2.76 cfs 0.560 af

Subcatchment EDA-3: Flow to central Runoff Area=680,802 sf 1.42% Impervious Runoff Depth=0.23"
Flow Length=237' Tc=14.2 min CN=37 Runoff=0.62 cfs 0.299 af

Subcatchment EDA-3A: Flow to central Runoff Area=820,784 sf 2.23% Impervious Runoff Depth=1.24"
Flow Length=208' Tc=19.6 min CN=55 Runoff=15.71 cfs 1.946 af

Subcatchment EDA-4: Flow to east swamp Runoff Area=531,965 sf 0.00% Impervious Runoff Depth=0.67"
Flow Length=320' Tc=15.3 min CN=46 Runoff=4.12 cfs 0.679 af

Subcatchment EDA-4A: Flow to east Runoff Area=213,749 sf 0.00% Impervious Runoff Depth=2.50"
Flow Length=230' Slope=0.0150 '/' Tc=18.7 min CN=71 Runoff=9.85 cfs 1.023 af

Subcatchment EDA-4B: Flow to east Runoff Area=191,650 sf 0.39% Impervious Runoff Depth=0.07"
Flow Length=283' Tc=17.4 min CN=32 Runoff=0.04 cfs 0.025 af

Subcatchment EDA-5: flow to isolated wets Runoff Area=284,124 sf 0.07% Impervious Runoff Depth=0.03"
Flow Length=260' Tc=17.2 min CN=30 Runoff=0.02 cfs 0.016 af

Subcatchment EDA-6: Uncontrolled flow to Runoff Area=8,799 sf 20.67% Impervious Runoff Depth=1.38"
Flow Length=50' Slope=0.0200 '/' Tc=5.6 min UI Adjusted CN=57 Runoff=0.29 cfs 0.023 af

Reach 3R: Drainage in Winthrop Inflow=6.34 cfs 0.621 af
Outflow=6.34 cfs 0.621 af

Reach DP1: (new Reach) Inflow=7.03 cfs 0.756 af
Outflow=7.03 cfs 0.756 af

Reach DP2: Stream North to Hill Street Inflow=6.26 cfs 0.794 af
Outflow=6.26 cfs 0.794 af

Reach DP3: Central Wetland Inflow=15.77 cfs 2.245 af
Outflow=15.77 cfs 2.245 af

Reach DP4: East wetland Inflow=13.74 cfs 1.727 af
Outflow=13.74 cfs 1.727 af

Reach DP5: Isolated wetland Inflow=0.02 cfs 0.016 af
Outflow=0.02 cfs 0.016 af

Pond 1P: Storage @ Wets Peak Elev=260.39' Storage=4,111 cf Inflow=6.96 cfs 0.778 af
Discarded=0.14 cfs 0.139 af Primary=6.34 cfs 0.621 af Outflow=6.47 cfs 0.760 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=256.12' Storage=2,367 cf Inflow=7.41 cfs 0.779 af
Discarded=0.18 cfs 0.024 af Primary=7.03 cfs 0.756 af Outflow=7.21 cfs 0.779 af

Pond 3P: storage w/in Swamp PVP Peak Elev=274.52' Storage=19,188 cf Inflow=2.76 cfs 0.560 af
Outflow=0.29 cfs 0.137 af

Total Runoff Area = 88.715 ac Runoff Volume = 6.164 af Average Runoff Depth = 0.83"
98.40% Pervious = 87.297 ac 1.60% Impervious = 1.419 ac

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 @ Partrige

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"

	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

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

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)

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

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

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

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

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)

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 @ Partrige/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 '/' 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 @ 12.46 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)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=253,893 sf 5.78% Impervious Runoff Depth=2.39"
Flow Length=410' Tc=18.5 min CN=60 Runoff=10.89 cfs 1.163 af

Subcatchment EDA-1A: Flow to Runoff Area=90,949 sf 12.28% Impervious Runoff Depth=1.50"
Flow Length=700' Tc=20.9 min CN=50 Runoff=2.05 cfs 0.261 af

Subcatchment EDA-2: DA-1 Northwest to Runoff Area=262,052 sf 1.98% Impervious Runoff Depth=2.03"
Flow Length=450' Tc=13.3 min CN=56 Runoff=10.41 cfs 1.015 af

Subcatchment EDA-2A: EDA-2A Flow to Runoff Area=525,669 sf 0.00% Impervious Runoff Depth=1.02"
Flow Length=470' Tc=21.7 min CN=44 Runoff=6.61 cfs 1.028 af

Subcatchment EDA-3: Flow to central Runoff Area=680,802 sf 1.42% Impervious Runoff Depth=0.53"
Flow Length=237' Tc=14.2 min CN=37 Runoff=3.20 cfs 0.696 af

Subcatchment EDA-3A: Flow to central Runoff Area=820,784 sf 2.23% Impervious Runoff Depth=1.94"
Flow Length=208' Tc=19.6 min CN=55 Runoff=26.54 cfs 3.040 af

Subcatchment EDA-4: Flow to east swamp Runoff Area=531,965 sf 0.00% Impervious Runoff Depth=1.18"
Flow Length=320' Tc=15.3 min CN=46 Runoff=9.39 cfs 1.198 af

Subcatchment EDA-4A: Flow to east Runoff Area=213,749 sf 0.00% Impervious Runoff Depth=3.47"
Flow Length=230' Slope=0.0150 '/' Tc=18.7 min CN=71 Runoff=13.79 cfs 1.420 af

Subcatchment EDA-4B: Flow to east Runoff Area=191,650 sf 0.39% Impervious Runoff Depth=0.25"
Flow Length=283' Tc=17.4 min CN=32 Runoff=0.16 cfs 0.093 af

Subcatchment EDA-5: flow to isolated wets Runoff Area=284,124 sf 0.07% Impervious Runoff Depth=0.16"
Flow Length=260' Tc=17.2 min CN=30 Runoff=0.14 cfs 0.089 af

Subcatchment EDA-6: Uncontrolled flow to Runoff Area=8,799 sf 20.67% Impervious Runoff Depth=2.12"
Flow Length=50' Slope=0.0200 '/' Tc=5.6 min UI Adjusted CN=57 Runoff=0.47 cfs 0.036 af

Reach 3R: Drainage in Winthrop Inflow=10.16 cfs 0.999 af
Outflow=10.16 cfs 0.999 af

Reach DP1: (new Reach) Inflow=11.94 cfs 1.228 af
Outflow=11.94 cfs 1.228 af

Reach DP2: Stream North to Hill Street Inflow=10.41 cfs 1.621 af
Outflow=10.41 cfs 1.621 af

Reach DP3: Central Wetland Inflow=29.08 cfs 3.735 af
Outflow=29.08 cfs 3.735 af

Reach DP4: East wetland Inflow=23.17 cfs 2.711 af
Outflow=23.17 cfs 2.711 af

Reach DP5: Isolated wetland Inflow=0.14 cfs 0.089 af
Outflow=0.14 cfs 0.089 af

Pond 1P: Storage @ Wets Peak Elev=260.53' Storage=4,953 cf Inflow=10.89 cfs 1.163 af
Discarded=0.15 cfs 0.145 af Primary=10.16 cfs 0.999 af Outflow=10.31 cfs 1.144 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=256.22' Storage=2,716 cf Inflow=12.21 cfs 1.260 af
Discarded=0.20 cfs 0.033 af Primary=11.94 cfs 1.228 af Outflow=12.14 cfs 1.260 af

Pond 3P: storage w/in Swamp PVP Peak Elev=274.55' Storage=20,647 cf Inflow=6.61 cfs 1.028 af
Outflow=1.33 cfs 0.606 af

Total Runoff Area = 88.715 ac Runoff Volume = 10.038 af Average Runoff Depth = 1.36"
98.40% Pervious = 87.297 ac 1.60% Impervious = 1.419 ac

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 @ Partrige

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

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

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)

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

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

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

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

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)

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 '/' 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 @ 12.36 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)

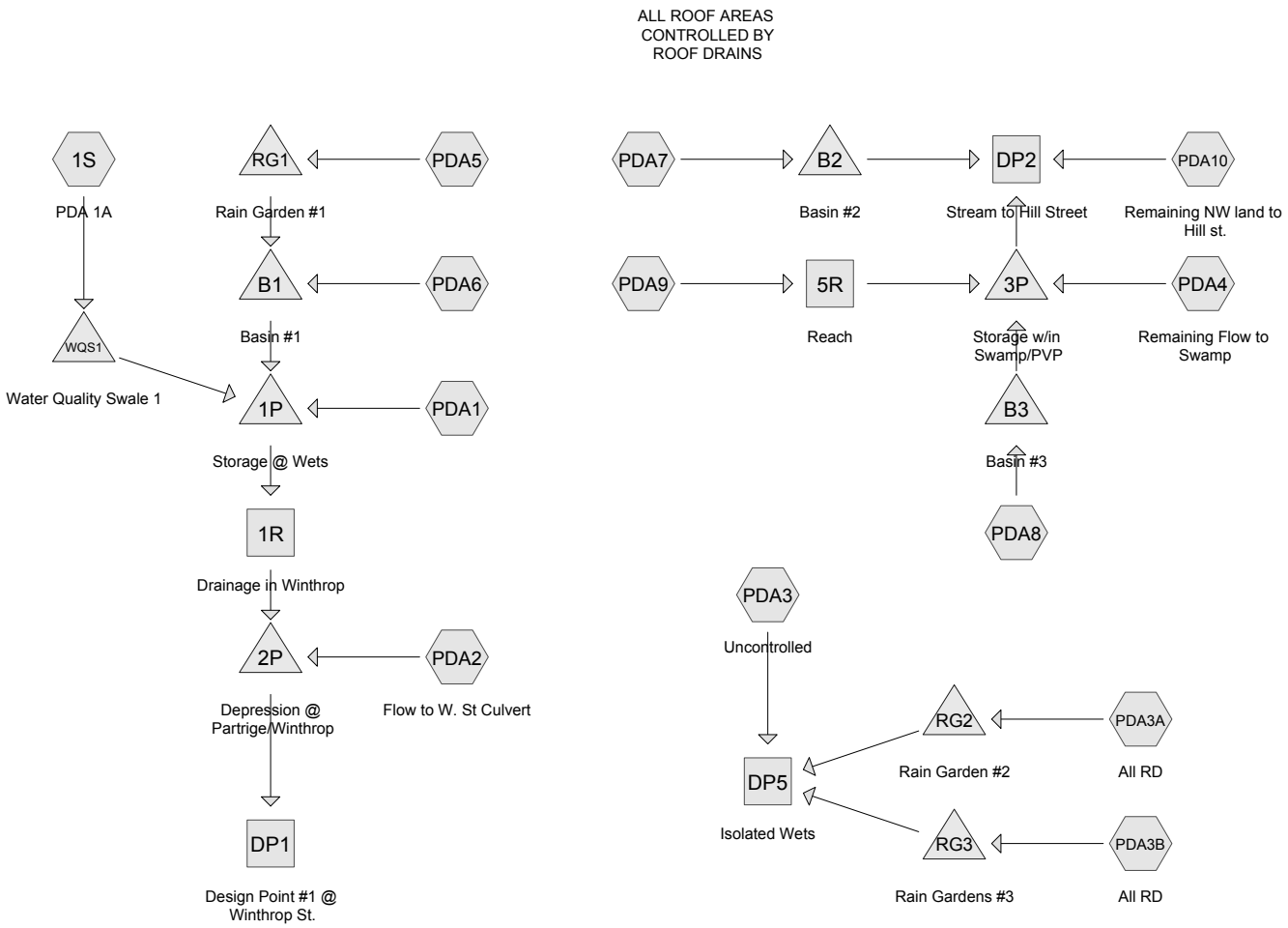
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
274.00	27,000	1,100.0	0	0	27,000
275.00	74,000	1,890.0	48,566	48,566	214,976

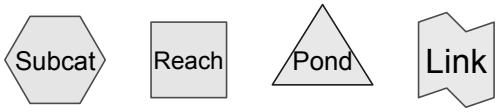
Device	Routing	Invert	Outlet Devices
#1	Primary	274.50'	**50.0' long x 50.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

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)





Routing Diagram for OE2675-POST-WEST-NORTH-3.2.18
Prepared by Microsoft, Printed 3/28/2018
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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**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.227	0.000	0.173	0.000	0.000	0.400	50-75% Grass cover, Fair	PDA1
6.369	0.000	3.877	0.028	0.000	10.274	>75% Grass cover, Good	1S, PDA10, PDA2, PDA3, PDA3A, PDA3B, PDA4, PDA5, PDA6, PDA7, PDA8
1.517	0.000	0.000	0.000	0.000	1.517	Brush, Fair	PDA9
0.003	0.000	0.000	0.000	0.000	0.003	Ex. Roofs	PDA5
0.062	0.000	0.000	0.000	0.000	0.062	Gravel surface	PDA9
1.038	0.000	1.495	0.000	0.000	2.533	Paved parking	PDA6, PDA7, PDA8
0.000	0.000	0.147	0.000	0.000	0.147	Pavement	1S
0.000	0.000	0.000	3.415	0.000	3.415	Woods, Fair	PDA4
8.471	0.000	1.123	1.397	0.000	10.991	Woods, Good	1S, PDA1, PDA10, PDA2, PDA3, PDA4, PDA5, PDA6
1.069	0.000	0.089	0.000	0.000	1.158	Woods/grass comb., Fair	PDA10, PDA8
0.000	0.000	0.000	0.000	0.048	0.048	ex roof	PDA10, PDA3, PDA9
0.000	0.000	0.000	0.000	0.172	0.172	ex roof and drive	PDA2
0.000	0.000	0.000	0.000	0.014	0.014	ex. roof	PDA1
18.756	**0.000**	**6.904**	**4.840**	**0.235**	**30.736**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PDA 1A Runoff Area=34,856 sf 18.36% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=78 Runoff=1.15 cfs 0.085 af

SubcatchmentPDA1: Runoff Area=36,360 sf 1.71% Impervious Runoff Depth=0.34"
Flow Length=300' Tc=7.8 min CN=58 Runoff=0.14 cfs 0.024 af

SubcatchmentPDA10: Remaining NW Runoff Area=217,182 sf 0.41% Impervious Runoff Depth=0.25"
Flow Length=450' Tc=13.3 min CN=55 Runoff=0.48 cfs 0.104 af

SubcatchmentPDA2: Flow to W. St Culvert Runoff Area=70,255 sf 10.68% Impervious Runoff Depth=0.13"
Flow Length=535' Tc=6.5 min CN=50 Runoff=0.04 cfs 0.017 af

SubcatchmentPDA3: Uncontrolled Runoff Area=186,342 sf 0.10% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=18.7 min CN=31 Runoff=0.00 cfs 0.000 af

SubcatchmentPDA3A: All RD Runoff Area=17,000 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

SubcatchmentPDA3B: All RD Runoff Area=8,800 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

SubcatchmentPDA4: Remaining Flow to Runoff Area=306,243 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=470' Tc=9.3 min CN=55 Runoff=0.71 cfs 0.147 af

SubcatchmentPDA5: Runoff Area=40,415 sf 0.35% Impervious Runoff Depth=1.04"
Flow Length=160' Tc=8.7 min CN=74 Runoff=0.95 cfs 0.080 af

SubcatchmentPDA6: Runoff Area=133,615 sf 23.95% Impervious Runoff Depth=0.64"
Flow Length=752' Tc=8.5 min CN=66 Runoff=1.68 cfs 0.164 af

SubcatchmentPDA7: Runoff Area=86,474 sf 38.31% Impervious Runoff Depth=0.93"
Flow Length=721' Tc=11.8 min CN=72 Runoff=1.62 cfs 0.154 af

SubcatchmentPDA8: Runoff Area=131,490 sf 34.40% Impervious Runoff Depth=0.41"
Flow Length=416' Tc=17.9 min CN=60 Runoff=0.62 cfs 0.103 af

SubcatchmentPDA9: Runoff Area=69,814 sf 1.48% Impervious Runoff Depth=0.00"
Flow Length=480' Tc=12.0 min CN=38 Runoff=0.00 cfs 0.000 af

Reach 1R: Drainage in Winthrop Inflow=0.26 cfs 0.030 af
Outflow=0.26 cfs 0.030 af

Reach 5R: Reach Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
12.0" Round Pipe n=0.011 L=115.0' S=0.0217 '/' Capacity=6.21 cfs Outflow=0.00 cfs 0.000 af

Reach DP1: Design Point #1 @ Winthrop St. Inflow=0.28 cfs 0.043 af
Outflow=0.28 cfs 0.043 af

Reach DP2: Stream to Hill Street Inflow=0.48 cfs 0.104 af
Outflow=0.48 cfs 0.104 af

Reach DP5: Isolated Wets Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 1P: Storage @ Wets Peak Elev=260.05' Storage=2,412 cf Inflow=1.04 cfs 0.141 af
Discarded=0.10 cfs 0.107 af Primary=0.26 cfs 0.030 af Outflow=0.36 cfs 0.136 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=254.48' Storage=28 cf Inflow=0.29 cfs 0.047 af
Discarded=0.01 cfs 0.004 af Primary=0.28 cfs 0.043 af Outflow=0.29 cfs 0.047 af

Pond 3P: Storage w/in Swamp/PVP Peak Elev=274.20' Storage=6,402 cf Inflow=0.71 cfs 0.147 af
Outflow=0.00 cfs 0.000 af

Pond B1: Basin #1 Peak Elev=266.82' Storage=2,101 cf Inflow=1.68 cfs 0.170 af
Discarded=0.21 cfs 0.138 af Primary=0.25 cfs 0.032 af Outflow=0.46 cfs 0.170 af

Pond B2: Basin #2 Peak Elev=275.02' Storage=1,750 cf Inflow=1.62 cfs 0.154 af
Discarded=0.42 cfs 0.154 af Primary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.154 af

Pond B3: Basin #3 Peak Elev=277.56' Storage=406 cf Inflow=0.62 cfs 0.103 af
Discarded=0.38 cfs 0.103 af Primary=0.00 cfs 0.000 af Outflow=0.38 cfs 0.103 af

Pond RG1: Rain Garden #1 Peak Elev=270.42' Storage=939 cf Inflow=0.95 cfs 0.080 af
Discarded=0.14 cfs 0.074 af Primary=0.28 cfs 0.006 af Outflow=0.42 cfs 0.080 af

Pond RG2: Rain Garden #2 Peak Elev=275.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond RG3: Rain Gardens #3 Peak Elev=275.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond WQS1: Water Quality Swale 1 Peak Elev=262.84' Storage=487 cf Inflow=1.15 cfs 0.085 af
Outflow=0.90 cfs 0.085 af

Total Runoff Area = 30.736 ac Runoff Volume = 0.878 af Average Runoff Depth = 0.34"
90.50% Pervious = 27.817 ac 9.50% Impervious = 2.919 ac

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

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"

	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:

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 0.06" for 2-year event
Inflow = 0.26 cfs @ 13.26 hrs, Volume= 0.030 af
Outflow = 0.26 cfs @ 13.26 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

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

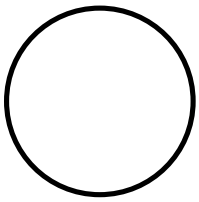
Summary for Reach 5R: Reach

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.

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.07" for 2-year event
Inflow = 0.28 cfs @ 13.29 hrs, Volume= 0.043 af
Outflow = 0.28 cfs @ 13.29 hrs, Volume= 0.043 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

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

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 Pond 1P: Storage @ Wets

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth > 0.30" for 2-year event
Inflow = 1.04 cfs @ 12.17 hrs, Volume= 0.141 af
Outflow = 0.36 cfs @ 13.26 hrs, Volume= 0.136 af, Atten= 65%, Lag= 65.5 min
Discarded = 0.10 cfs @ 13.26 hrs, Volume= 0.107 af
Primary = 0.26 cfs @ 13.26 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 260.05' @ 13.26 hrs Surf.Area= 4,178 sf Storage= 2,412 cf

Plug-Flow detention time= 247.7 min calculated for 0.136 af (97% of inflow)
Center-of-Mass det. time= 229.2 min (1,098.8 - 869.6)

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 @ 13.26 hrs HW=260.05' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.26 cfs @ 13.26 hrs HW=260.05' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.26 cfs @ 0.56 fps)

Summary for Pond 2P: Depression @ Partrige/Winthrop

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.08" for 2-year event
Inflow = 0.29 cfs @ 13.26 hrs, Volume= 0.047 af
Outflow = 0.29 cfs @ 13.29 hrs, Volume= 0.047 af, Atten= 0%, Lag= 1.6 min
Discarded = 0.01 cfs @ 13.29 hrs, Volume= 0.004 af
Primary = 0.28 cfs @ 13.29 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 254.48' @ 13.29 hrs Surf.Area= 175 sf Storage= 28 cf

Plug-Flow detention time= 2.4 min calculated for 0.047 af (100% of inflow)
Center-of-Mass det. time= 2.5 min (901.5 - 899.0)

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=0.01 cfs @ 13.29 hrs HW=254.48' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.28 cfs @ 13.29 hrs HW=254.48' (Free Discharge)
├─**2=Culvert** (Inlet Controls 0.28 cfs @ 1.58 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 =	0.46 cfs @	12.73 hrs,	Volume=	0.170 af,	Atten= 72%, Lag= 34.8 min
Discarded =	0.21 cfs @	12.73 hrs,	Volume=	0.138 af	
Primary =	0.25 cfs @	12.73 hrs,	Volume=	0.032 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 266.82' @ 12.73 hrs Surf.Area= 3,768 sf Storage= 2,101 cf

Plug-Flow detention time= 66.1 min calculated for 0.170 af (100% of inflow)
Center-of-Mass det. time= 66.1 min (954.5 - 888.5)

Volume	Invert	Avail.Storage	Storage Description
#1	266.20'	16,732 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)
266.20	3,039	303.7	0	0	3,039
268.00	5,379	341.2	7,477	7,477	5,049
269.50	6,997	372.2	9,255	16,732	6,889

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.20'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	266.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	267.50'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.3' Crest Height
#4	Primary	268.50'	**12.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.21 cfs @ 12.73 hrs HW=266.82' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.21 cfs)

Primary OutFlow Max=0.25 cfs @ 12.73 hrs HW=266.82' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 1.92 fps)
├─**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

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)

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 Pond WQS1: Water Quality Swale 1

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 =	0.90 cfs @	12.17 hrs,	Volume=	0.085 af,	Atten= 22%, Lag= 4.2 min
Primary =	0.90 cfs @	12.17 hrs,	Volume=	0.085 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 262.84' @ 12.17 hrs Surf.Area= 655 sf Storage= 487 cf

Plug-Flow detention time= 26.0 min calculated for 0.085 af (100% of inflow)
Center-of-Mass det. time= 26.3 min (875.4 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1	261.90'	1,420 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)
261.90	1	4.0	0	0	1
262.00	472	164.9	16	16	2,164
264.00	960	180.3	1,403	1,420	2,710

Device	Routing	Invert	Outlet Devices
#1	Primary	261.90'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir**
			Cv= 2.56 (C= 3.20)
#2	Primary	263.40'	**12.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

0.5' Crest Height

Primary OutFlow Max=0.88 cfs @ 12.17 hrs HW=262.83' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.88 cfs @ 2.47 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PDA 1A Runoff Area=34,856 sf 18.36% Impervious Runoff Depth=2.46"
Tc=6.0 min CN=78 Runoff=2.26 cfs 0.164 af

SubcatchmentPDA1: Runoff Area=36,360 sf 1.71% Impervious Runoff Depth=1.01"
Flow Length=300' Tc=7.8 min CN=58 Runoff=0.75 cfs 0.070 af

SubcatchmentPDA10: Remaining NW Runoff Area=217,182 sf 0.41% Impervious Runoff Depth=0.83"
Flow Length=450' Tc=13.3 min CN=55 Runoff=2.85 cfs 0.347 af

SubcatchmentPDA2: Flow to W. St Culvert Runoff Area=70,255 sf 10.68% Impervious Runoff Depth=0.57"
Flow Length=535' Tc=6.5 min CN=50 Runoff=0.57 cfs 0.077 af

SubcatchmentPDA3: Uncontrolled Runoff Area=186,342 sf 0.10% Impervious Runoff Depth=0.00"
Flow Length=210' Tc=18.7 min CN=31 Runoff=0.00 cfs 0.001 af

SubcatchmentPDA3A: All RD Runoff Area=17,000 sf 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.005 af

SubcatchmentPDA3B: All RD Runoff Area=8,800 sf 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.002 af

SubcatchmentPDA4: Remaining Flow to Runoff Area=306,243 sf 0.00% Impervious Runoff Depth=0.83"
Flow Length=470' Tc=9.3 min CN=55 Runoff=4.57 cfs 0.489 af

SubcatchmentPDA5: Runoff Area=40,415 sf 0.35% Impervious Runoff Depth=2.13"
Flow Length=160' Tc=8.7 min CN=74 Runoff=2.05 cfs 0.164 af

SubcatchmentPDA6: Runoff Area=133,615 sf 23.95% Impervious Runoff Depth=1.53"
Flow Length=752' Tc=8.5 min CN=66 Runoff=4.66 cfs 0.390 af

SubcatchmentPDA7: Runoff Area=86,474 sf 38.31% Impervious Runoff Depth=1.97"
Flow Length=721' Tc=11.8 min CN=72 Runoff=3.70 cfs 0.326 af

SubcatchmentPDA8: Runoff Area=131,490 sf 34.40% Impervious Runoff Depth=1.13"
Flow Length=416' Tc=17.9 min CN=60 Runoff=2.43 cfs 0.284 af

SubcatchmentPDA9: Runoff Area=69,814 sf 1.48% Impervious Runoff Depth=0.12"
Flow Length=480' Tc=12.0 min CN=38 Runoff=0.02 cfs 0.016 af

Reach 1R: Drainage in Winthrop Inflow=2.92 cfs 0.334 af
Outflow=2.92 cfs 0.334 af

Reach 5R: Reach Avg. Flow Depth=0.05' Max Vel=1.93 fps Inflow=0.02 cfs 0.016 af
12.0" Round Pipe n=0.011 L=115.0' S=0.0217 '/' Capacity=6.21 cfs Outflow=0.02 cfs 0.016 af

Reach DP1: Design Point #1 @ Winthrop St. Inflow=2.85 cfs 0.399 af
Outflow=2.85 cfs 0.399 af

Reach DP2: Stream to Hill Street Inflow=2.85 cfs 0.348 af
Outflow=2.85 cfs 0.348 af

Reach DP5: Isolated Wets Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Pond 1P: Storage @ Wets Peak Elev=260.23' Storage=3,273 cf Inflow=3.22 cfs 0.475 af
Discarded=0.12 cfs 0.129 af Primary=2.92 cfs 0.334 af Outflow=3.04 cfs 0.464 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=255.43' Storage=743 cf Inflow=3.24 cfs 0.412 af
Discarded=0.09 cfs 0.012 af Primary=2.85 cfs 0.399 af Outflow=2.94 cfs 0.412 af

Pond 3P: Storage w/in Swamp/PVP Peak Elev=274.55' Storage=21,976 cf Inflow=4.57 cfs 0.505 af
Outflow=0.00 cfs 0.000 af

Pond B1: Basin #1 Peak Elev=267.76' Storage=6,206 cf Inflow=6.13 cfs 0.448 af
Discarded=0.28 cfs 0.207 af Primary=2.01 cfs 0.241 af Outflow=2.29 cfs 0.448 af

Pond B2: Basin #2 Peak Elev=276.13' Storage=4,887 cf Inflow=3.70 cfs 0.326 af
Discarded=0.66 cfs 0.324 af Primary=0.04 cfs 0.002 af Outflow=0.70 cfs 0.326 af

Pond B3: Basin #3 Peak Elev=278.07' Storage=4,042 cf Inflow=2.43 cfs 0.284 af
Discarded=0.41 cfs 0.284 af Primary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.284 af

Pond RG1: Rain Garden #1 Peak Elev=270.51' Storage=1,152 cf Inflow=2.05 cfs 0.164 af
Discarded=0.14 cfs 0.107 af Primary=1.59 cfs 0.057 af Outflow=1.73 cfs 0.164 af

Pond RG2: Rain Garden #2 Peak Elev=275.00' Storage=2 cf Inflow=0.01 cfs 0.005 af
Discarded=0.01 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.005 af

Pond RG3: Rain Gardens #3 Peak Elev=275.00' Storage=1 cf Inflow=0.00 cfs 0.002 af
Discarded=0.00 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond WQS1: Water Quality Swale 1 Peak Elev=263.17' Storage=719 cf Inflow=2.26 cfs 0.164 af
Outflow=1.94 cfs 0.164 af

Total Runoff Area = 30.736 ac Runoff Volume = 2.335 af Average Runoff Depth = 0.91"
90.50% Pervious = 27.817 ac 9.50% Impervious = 2.919 ac

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

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"

	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

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 0.71" for 10-year event
Inflow = 2.92 cfs @ 12.51 hrs, Volume= 0.334 af
Outflow = 2.92 cfs @ 12.51 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

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

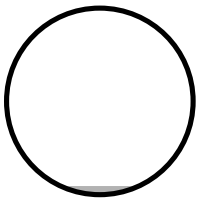
Summary for Reach 5R: Reach

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.

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 0.66" for 10-year event
Inflow = 2.85 cfs @ 12.61 hrs, Volume= 0.399 af
Outflow = 2.85 cfs @ 12.61 hrs, Volume= 0.399 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

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

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 Pond 1P: Storage @ Wets

Inflow Area =	5.630 ac,	15.97% Impervious,	Inflow Depth =	1.01"	for 10-year event
Inflow =	3.22 cfs @	12.16 hrs,	Volume=	0.475 af	
Outflow =	3.04 cfs @	12.51 hrs,	Volume=	0.464 af,	Atten= 6%, Lag= 20.8 min
Discarded =	0.12 cfs @	12.51 hrs,	Volume=	0.129 af	
Primary =	2.92 cfs @	12.51 hrs,	Volume=	0.334 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 260.23' @ 12.51 hrs Surf.Area= 5,038 sf Storage= 3,273 cf

Plug-Flow detention time= 90.7 min calculated for 0.463 af (97% of inflow)
Center-of-Mass det. time= 77.6 min (917.1 - 839.5)

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 @ 12.51 hrs HW=260.23' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.12 cfs)

Primary OutFlow Max=2.91 cfs @ 12.51 hrs HW=260.23' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 2.91 cfs @ 1.25 fps)

Summary for Pond 2P: Depression @ Partrige/Winthrop

Inflow Area =	7.243 ac,	14.79% Impervious,	Inflow Depth =	0.68"	for 10-year event
Inflow =	3.24 cfs @	12.48 hrs,	Volume=	0.412 af	
Outflow =	2.94 cfs @	12.61 hrs,	Volume=	0.412 af,	Atten= 10%, Lag= 7.5 min
Discarded =	0.09 cfs @	12.61 hrs,	Volume=	0.012 af	
Primary =	2.85 cfs @	12.61 hrs,	Volume=	0.399 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 255.43' @ 12.61 hrs Surf.Area= 1,560 sf Storage= 743 cf

Plug-Flow detention time= 2.4 min calculated for 0.411 af (100% of inflow)
Center-of-Mass det. time= 2.4 min (839.4 - 837.0)

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=0.09 cfs @ 12.61 hrs HW=255.43' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.09 cfs)

Primary OutFlow Max=2.84 cfs @ 12.61 hrs HW=255.43' (Free Discharge)
├─**2=Culvert** (Inlet Controls 2.84 cfs @ 3.62 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 =	2.29 cfs @	12.51 hrs,	Volume=	0.448 af,	Atten= 63%, Lag= 20.9 min
Discarded =	0.28 cfs @	12.51 hrs,	Volume=	0.207 af	
Primary =	2.01 cfs @	12.51 hrs,	Volume=	0.241 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 267.76' @ 12.51 hrs Surf.Area= 5,022 sf Storage= 6,206 cf

Plug-Flow detention time= 66.0 min calculated for 0.448 af (100% of inflow)
Center-of-Mass det. time= 65.8 min (915.4 - 849.7)

Volume	Invert	Avail.Storage	Storage Description
#1	266.20'	16,732 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)
266.20	3,039	303.7	0	0	3,039
268.00	5,379	341.2	7,477	7,477	5,049
269.50	6,997	372.2	9,255	16,732	6,889

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.20'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	266.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	267.50'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir**
			2 End Contraction(s) 1.3' Crest Height
#4	Primary	268.50'	**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 @ 12.51 hrs HW=267.75' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=2.00 cfs @ 12.51 hrs HW=267.75' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.95 cfs @ 4.83 fps)
├─**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.05 cfs @ 1.69 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

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)

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 @ 13.85 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 =	0.14"	for 10-year event
Inflow =	0.00 cfs @	13.76 hrs,	Volume=	0.002 af	
Outflow =	0.00 cfs @	13.85 hrs,	Volume=	0.002 af,	Atten= 0%, Lag= 5.1 min
Discarded =	0.00 cfs @	13.85 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= 275.00' @ 13.85 hrs Surf.Area= 346 sf Storage= 1 cf

Plug-Flow detention time= 5.1 min calculated for 0.002 af (100% of inflow)
Center-of-Mass det. time= 5.1 min (1,039.2 - 1,034.2)

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 @ 13.85 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 Pond WQS1: Water Quality Swale 1

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 = 1.94 cfs @ 12.15 hrs, Volume= 0.164 af, Atten= 14%, Lag= 3.1 min
Primary = 1.94 cfs @ 12.15 hrs, Volume= 0.164 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 263.17' @ 12.15 hrs Surf.Area= 737 sf Storage= 719 cf

Plug-Flow detention time= 19.8 min calculated for 0.164 af (100% of inflow)
Center-of-Mass det. time= 19.7 min (849.6 - 829.9)

Volume	Invert	Avail.Storage	Storage Description
#1	261.90'	1,420 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)
261.90	1	4.0	0	0	1
262.00	472	164.9	16	16	2,164
264.00	960	180.3	1,403	1,420	2,710

Device	Routing	Invert	Outlet Devices
#1	Primary	261.90'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir**
			Cv= 2.56 (C= 3.20)
#2	Primary	263.40'	**12.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

0.5' Crest Height

Primary OutFlow Max=1.92 cfs @ 12.15 hrs HW=263.17' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.92 cfs @ 2.88 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PDA 1A Runoff Area=34,856 sf 18.36% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=78 Runoff=2.89 cfs 0.209 af

SubcatchmentPDA1: Runoff Area=36,360 sf 1.71% Impervious Runoff Depth=1.45"
Flow Length=300' Tc=7.8 min CN=58 Runoff=1.17 cfs 0.101 af

SubcatchmentPDA10: Remaining NW Runoff Area=217,182 sf 0.41% Impervious Runoff Depth=1.24"
Flow Length=450' Tc=13.3 min CN=55 Runoff=4.81 cfs 0.515 af

SubcatchmentPDA2: Flow to W. St Culvert Runoff Area=70,255 sf 10.68% Impervious Runoff Depth=0.91"
Flow Length=535' Tc=6.5 min CN=50 Runoff=1.20 cfs 0.122 af

SubcatchmentPDA3: Uncontrolled Runoff Area=186,342 sf 0.10% Impervious Runoff Depth=0.05"
Flow Length=210' Tc=18.7 min CN=31 Runoff=0.02 cfs 0.017 af

SubcatchmentPDA3A: All RD Runoff Area=17,000 sf 0.00% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=39 Runoff=0.04 cfs 0.010 af

SubcatchmentPDA3B: All RD Runoff Area=8,800 sf 0.00% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.005 af

SubcatchmentPDA4: Remaining Flow to Runoff Area=306,243 sf 0.00% Impervious Runoff Depth=1.24"
Flow Length=470' Tc=9.3 min CN=55 Runoff=7.64 cfs 0.726 af

SubcatchmentPDA5: Runoff Area=40,415 sf 0.35% Impervious Runoff Depth=2.77"
Flow Length=160' Tc=8.7 min CN=74 Runoff=2.68 cfs 0.214 af

SubcatchmentPDA6: Runoff Area=133,615 sf 23.95% Impervious Runoff Depth=2.08"
Flow Length=752' Tc=8.5 min CN=66 Runoff=6.50 cfs 0.531 af

SubcatchmentPDA7: Runoff Area=86,474 sf 38.31% Impervious Runoff Depth=2.59"
Flow Length=721' Tc=11.8 min CN=72 Runoff=4.92 cfs 0.428 af

SubcatchmentPDA8: Runoff Area=131,490 sf 34.40% Impervious Runoff Depth=1.60"
Flow Length=416' Tc=17.9 min CN=60 Runoff=3.66 cfs 0.403 af

SubcatchmentPDA9: Runoff Area=69,814 sf 1.48% Impervious Runoff Depth=0.27"
Flow Length=480' Tc=12.0 min CN=38 Runoff=0.10 cfs 0.036 af

Reach 1R: Drainage in Winthrop Inflow=5.69 cfs 0.547 af
Outflow=5.69 cfs 0.547 af

Reach 5R: Reach Avg. Flow Depth=0.09' Max Vel=2.95 fps Inflow=0.10 cfs 0.036 af
12.0" Round Pipe n=0.011 L=115.0' S=0.0217 '/' Capacity=6.21 cfs Outflow=0.10 cfs 0.036 af

Reach DP1: Design Point #1 @ Winthrop St. Inflow=5.97 cfs 0.648 af
Outflow=5.97 cfs 0.648 af

Reach DP2: Stream to Hill Street Inflow=4.81 cfs 0.545 af
Outflow=4.81 cfs 0.545 af

Reach DP5: Isolated Wets Inflow=0.02 cfs 0.017 af
Outflow=0.02 cfs 0.017 af

Pond 1P: Storage @ Wets Peak Elev=260.36' Storage=3,960 cf Inflow=6.03 cfs 0.699 af
Discarded=0.13 cfs 0.138 af Primary=5.69 cfs 0.547 af Outflow=5.82 cfs 0.685 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=256.09' Storage=2,277 cf Inflow=6.35 cfs 0.669 af
Discarded=0.18 cfs 0.021 af Primary=5.97 cfs 0.648 af Outflow=6.15 cfs 0.669 af

Pond 3P: Storage w/in Swamp/PVP Peak Elev=274.73' Storage=33,196 cf Inflow=7.64 cfs 0.762 af
Outflow=0.00 cfs 0.000 af

Pond B1: Basin #1 Peak Elev=268.02' Storage=7,582 cf Inflow=8.38 cfs 0.623 af
Discarded=0.30 cfs 0.234 af Primary=4.14 cfs 0.389 af Outflow=4.44 cfs 0.623 af

Pond B2: Basin #2 Peak Elev=276.59' Storage=6,608 cf Inflow=4.92 cfs 0.428 af
Discarded=0.74 cfs 0.398 af Primary=0.27 cfs 0.030 af Outflow=1.02 cfs 0.428 af

Pond B3: Basin #3 Peak Elev=278.46' Storage=7,055 cf Inflow=3.66 cfs 0.403 af
Discarded=0.45 cfs 0.403 af Primary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.403 af

Pond RG1: Rain Garden #1 Peak Elev=270.58' Storage=1,341 cf Inflow=2.68 cfs 0.214 af
Discarded=0.15 cfs 0.121 af Primary=2.05 cfs 0.093 af Outflow=2.20 cfs 0.214 af

Pond RG2: Rain Garden #2 Peak Elev=275.01' Storage=11 cf Inflow=0.04 cfs 0.010 af
Discarded=0.03 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.010 af

Pond RG3: Rain Gardens #3 Peak Elev=275.02' Storage=5 cf Inflow=0.02 cfs 0.005 af
Discarded=0.02 cfs 0.005 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.005 af

Pond WQS1: Water Quality Swale 1 Peak Elev=263.31' Storage=826 cf Inflow=2.89 cfs 0.209 af
Outflow=2.52 cfs 0.209 af

Total Runoff Area = 30.736 ac Runoff Volume = 3.318 af Average Runoff Depth = 1.30"
90.50% Pervious = 27.817 ac 9.50% Impervious = 2.919 ac

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

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"

	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

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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 1.17" for 25-year event
Inflow = 5.69 cfs @ 12.42 hrs, Volume= 0.547 af
Outflow = 5.69 cfs @ 12.42 hrs, Volume= 0.547 af, Atten= 0%, Lag= 0.0 min

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

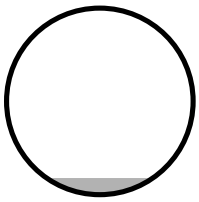
Summary for Reach 5R: Reach

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.

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 1.07" for 25-year event
Inflow = 5.97 cfs @ 12.48 hrs, Volume= 0.648 af
Outflow = 5.97 cfs @ 12.48 hrs, Volume= 0.648 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

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

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 Pond 1P: Storage @ Wets

Inflow Area =	5.630 ac,	15.97% Impervious,	Inflow Depth =	1.49"	for 25-year event
Inflow =	6.03 cfs @	12.35 hrs,	Volume=	0.699 af	
Outflow =	5.82 cfs @	12.42 hrs,	Volume=	0.685 af,	Atten= 3%, Lag= 4.3 min
Discarded =	0.13 cfs @	12.42 hrs,	Volume=	0.138 af	
Primary =	5.69 cfs @	12.42 hrs,	Volume=	0.547 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 260.36' @ 12.42 hrs Surf.Area= 5,675 sf Storage= 3,960 cf

Plug-Flow detention time= 65.7 min calculated for 0.684 af (98% of inflow)
Center-of-Mass det. time= 54.6 min (885.7 - 831.1)

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 @ 12.42 hrs HW=260.36' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.13 cfs)

Primary OutFlow Max=5.66 cfs @ 12.42 hrs HW=260.36' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 5.66 cfs @ 1.57 fps)

Summary for Pond 2P: Depression @ Partrige/Winthrop

Inflow Area =	7.243 ac,	14.79% Impervious,	Inflow Depth =	1.11"	for 25-year event
Inflow =	6.35 cfs @	12.40 hrs,	Volume=	0.669 af	
Outflow =	6.15 cfs @	12.48 hrs,	Volume=	0.669 af,	Atten= 3%, Lag= 4.3 min
Discarded =	0.18 cfs @	12.48 hrs,	Volume=	0.021 af	
Primary =	5.97 cfs @	12.48 hrs,	Volume=	0.648 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 256.09' @ 12.48 hrs Surf.Area= 3,154 sf Storage= 2,277 cf

Plug-Flow detention time= 4.3 min calculated for 0.669 af (100% of inflow)
Center-of-Mass det. time= 4.2 min (833.9 - 829.7)

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 @ 12.48 hrs HW=256.09' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.18 cfs)

Primary OutFlow Max=5.90 cfs @ 12.48 hrs HW=256.09' (Free Discharge)
├─**2=Culvert** (Inlet Controls 3.93 cfs @ 5.01 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 1.97 cfs @ 0.74 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 =	4.44 cfs @	12.40 hrs,	Volume=	0.623 af,	Atten= 47%, Lag= 15.8 min
Discarded =	0.30 cfs @	12.41 hrs,	Volume=	0.234 af	
Primary =	4.14 cfs @	12.40 hrs,	Volume=	0.389 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 268.02' @ 12.41 hrs Surf.Area= 5,399 sf Storage= 7,582 cf

Plug-Flow detention time= 60.0 min calculated for 0.622 af (100% of inflow)
Center-of-Mass det. time= 60.0 min (899.8 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1	266.20'	16,732 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)
266.20	3,039	303.7	0	0	3,039
268.00	5,379	341.2	7,477	7,477	5,049
269.50	6,997	372.2	9,255	16,732	6,889

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.20'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	266.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	267.50'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir**
			2 End Contraction(s) 1.3' Crest Height
#4	Primary	268.50'	**12.0' long x 1.00' rise Sharp-Crested Rectangular Weir**
			2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.30 cfs @ 12.41 hrs HW=268.02' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=4.13 cfs @ 12.40 hrs HW=268.02' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 1.06 cfs @ 5.42 fps)
├─**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.07 cfs @ 2.47 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

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 Pond WQS1: Water Quality Swale 1

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 = 2.52 cfs @ 12.14 hrs, Volume= 0.209 af, Atten= 13%, Lag= 2.8 min
Primary = 2.52 cfs @ 12.14 hrs, Volume= 0.209 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 263.31' @ 12.14 hrs Surf.Area= 773 sf Storage= 826 cf

Plug-Flow detention time= 17.4 min calculated for 0.209 af (100% of inflow)
Center-of-Mass det. time= 17.7 min (840.6 - 822.9)

Volume	Invert	Avail.Storage	Storage Description
#1	261.90'	1,420 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)
261.90	1	4.0	0	0	1
262.00	472	164.9	16	16	2,164
264.00	960	180.3	1,403	1,420	2,710

Device	Routing	Invert	Outlet Devices
#1	Primary	261.90'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir**
			Cv= 2.56 (C= 3.20)
#2	Primary	263.40'	**12.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

0.5' Crest Height

Primary OutFlow Max=2.48 cfs @ 12.14 hrs HW=263.30' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.48 cfs @ 3.03 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PDA 1A Runoff Area=34,856 sf 18.36% Impervious Runoff Depth=4.20"
Tc=6.0 min CN=78 Runoff=3.85 cfs 0.280 af

SubcatchmentPDA1: Runoff Area=36,360 sf 1.71% Impervious Runoff Depth=2.21"
Flow Length=300' Tc=7.8 min CN=58 Runoff=1.90 cfs 0.154 af

SubcatchmentPDA10: Remaining NW Runoff Area=217,182 sf 0.41% Impervious Runoff Depth=1.94"
Flow Length=450' Tc=13.3 min CN=55 Runoff=8.15 cfs 0.804 af

SubcatchmentPDA2: Flow to W. St Culvert Runoff Area=70,255 sf 10.68% Impervious Runoff Depth=1.50"
Flow Length=535' Tc=6.5 min CN=50 Runoff=2.34 cfs 0.202 af

SubcatchmentPDA3: Uncontrolled Runoff Area=186,342 sf 0.10% Impervious Runoff Depth=0.21"
Flow Length=210' Tc=18.7 min CN=31 Runoff=0.12 cfs 0.074 af

SubcatchmentPDA3A: All RD Runoff Area=17,000 sf 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.12 cfs 0.022 af

SubcatchmentPDA3B: All RD Runoff Area=8,800 sf 0.00% Impervious Runoff Depth=0.66"
Tc=6.0 min CN=39 Runoff=0.06 cfs 0.011 af

SubcatchmentPDA4: Remaining Flow to Runoff Area=306,243 sf 0.00% Impervious Runoff Depth=1.94"
Flow Length=470' Tc=9.3 min CN=55 Runoff=12.93 cfs 1.134 af

SubcatchmentPDA5: Runoff Area=40,415 sf 0.35% Impervious Runoff Depth=3.78"
Flow Length=160' Tc=8.7 min CN=74 Runoff=3.70 cfs 0.292 af

SubcatchmentPDA6: Runoff Area=133,615 sf 23.95% Impervious Runoff Depth=2.97"
Flow Length=752' Tc=8.5 min CN=66 Runoff=9.48 cfs 0.759 af

SubcatchmentPDA7: Runoff Area=86,474 sf 38.31% Impervious Runoff Depth=3.57"
Flow Length=721' Tc=11.8 min CN=72 Runoff=6.83 cfs 0.591 af

SubcatchmentPDA8: Runoff Area=131,490 sf 34.40% Impervious Runoff Depth=2.39"
Flow Length=416' Tc=17.9 min CN=60 Runoff=5.71 cfs 0.602 af

SubcatchmentPDA9: Runoff Area=69,814 sf 1.48% Impervious Runoff Depth=0.60"
Flow Length=480' Tc=12.0 min CN=38 Runoff=0.41 cfs 0.080 af

Reach 1R: Drainage in Winthrop Inflow=10.23 cfs 0.913 af
Outflow=10.23 cfs 0.913 af

Reach 5R: Reach Avg. Flow Depth=0.17' Max Vel=4.47 fps Inflow=0.41 cfs 0.080 af
12.0" Round Pipe n=0.011 L=115.0' S=0.0217 '/' Capacity=6.21 cfs Outflow=0.41 cfs 0.080 af

Reach DP1: Design Point #1 @ Winthrop St. Inflow=11.34 cfs 1.085 af
Outflow=11.34 cfs 1.085 af

Reach DP2: Stream to Hill Street Inflow=8.34 cfs 1.332 af
Outflow=8.34 cfs 1.332 af

Reach DP5: Isolated Wets Inflow=0.12 cfs 0.074 af
Outflow=0.12 cfs 0.074 af

Pond 1P: Storage @ Wets Peak Elev=260.53' Storage=4,968 cf Inflow=10.78 cfs 1.078 af
Discarded=0.15 cfs 0.148 af Primary=10.23 cfs 0.913 af Outflow=10.38 cfs 1.060 af

Pond 2P: Depression @ Partrige/Winthrop Peak Elev=256.21' Storage=2,677 cf Inflow=11.58 cfs 1.115 af
Discarded=0.20 cfs 0.030 af Primary=11.34 cfs 1.085 af Outflow=11.53 cfs 1.115 af

Pond 3P: Storage w/in Swamp/PVP Peak Elev=274.79' Storage=36,982 cf Inflow=13.05 cfs 1.233 af
Outflow=0.91 cfs 0.441 af

Pond B1: Basin #1 Peak Elev=268.34' Storage=9,363 cf Inflow=11.89 cfs 0.911 af
Discarded=0.32 cfs 0.268 af Primary=7.52 cfs 0.643 af Outflow=7.84 cfs 0.911 af

Pond B2: Basin #2 Peak Elev=277.31' Storage=9,610 cf Inflow=6.83 cfs 0.591 af
Discarded=0.87 cfs 0.505 af Primary=0.45 cfs 0.086 af Outflow=1.32 cfs 0.591 af

Pond B3: Basin #3 Peak Elev=279.04' Storage=11,945 cf Inflow=5.71 cfs 0.602 af
Discarded=0.50 cfs 0.583 af Primary=0.18 cfs 0.019 af Outflow=0.69 cfs 0.602 af

Pond RG1: Rain Garden #1 Peak Elev=270.71' Storage=1,691 cf Inflow=3.70 cfs 0.292 af
Discarded=0.15 cfs 0.141 af Primary=2.69 cfs 0.152 af Outflow=2.84 cfs 0.292 af

Pond RG2: Rain Garden #2 Peak Elev=275.16' Storage=128 cf Inflow=0.12 cfs 0.022 af
Discarded=0.05 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.022 af

Pond RG3: Rain Gardens #3 Peak Elev=275.21' Storage=75 cf Inflow=0.06 cfs 0.011 af
Discarded=0.02 cfs 0.011 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.011 af

Pond WQS1: Water Quality Swale 1 Peak Elev=263.47' Storage=947 cf Inflow=3.85 cfs 0.280 af
Outflow=3.70 cfs 0.281 af

Total Runoff Area = 30.736 ac Runoff Volume = 5.006 af Average Runoff Depth = 1.95"
90.50% Pervious = 27.817 ac 9.50% Impervious = 2.919 ac

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

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"

	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

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 1.95" for 100-year event
Inflow = 10.23 cfs @ 12.33 hrs, Volume= 0.913 af
Outflow = 10.23 cfs @ 12.33 hrs, Volume= 0.913 af, Atten= 0%, Lag= 0.0 min

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

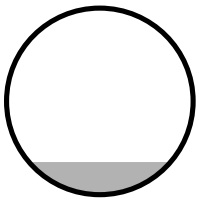
Summary for Reach 5R: Reach

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.

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 1.80" for 100-year event
Inflow = 11.34 cfs @ 12.34 hrs, Volume= 1.085 af
Outflow = 11.34 cfs @ 12.34 hrs, Volume= 1.085 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

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

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 Pond 1P: Storage @ Wets

Inflow Area = 5.630 ac, 15.97% Impervious, Inflow Depth = 2.30" for 100-year event
Inflow = 10.78 cfs @ 12.25 hrs, Volume= 1.078 af
Outflow = 10.38 cfs @ 12.33 hrs, Volume= 1.060 af, Atten= 4%, Lag= 4.4 min
Discarded = 0.15 cfs @ 12.33 hrs, Volume= 0.148 af
Primary = 10.23 cfs @ 12.33 hrs, Volume= 0.913 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 260.53' @ 12.33 hrs Surf.Area= 6,549 sf Storage= 4,968 cf

Plug-Flow detention time= 45.8 min calculated for 1.059 af (98% of inflow)
Center-of-Mass det. time= 37.3 min (862.4 - 825.1)

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=0.15 cfs @ 12.33 hrs HW=260.53' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=10.18 cfs @ 12.33 hrs HW=260.53' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 10.18 cfs @ 1.94 fps)

Summary for Pond 2P: Depression @ Partrige/Winthrop

Inflow Area = 7.243 ac, 14.79% Impervious, Inflow Depth = 1.85" for 100-year event
Inflow = 11.58 cfs @ 12.31 hrs, Volume= 1.115 af
Outflow = 11.53 cfs @ 12.34 hrs, Volume= 1.115 af, Atten= 0%, Lag= 1.4 min
Discarded = 0.20 cfs @ 12.34 hrs, Volume= 0.030 af
Primary = 11.34 cfs @ 12.34 hrs, Volume= 1.085 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 256.21' @ 12.34 hrs Surf.Area= 3,499 sf Storage= 2,677 cf

Plug-Flow detention time= 3.9 min calculated for 1.113 af (100% of inflow)
Center-of-Mass det. time= 3.9 min (830.5 - 826.6)

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 @ 12.34 hrs HW=256.21' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.20 cfs)

Primary OutFlow Max=11.28 cfs @ 12.34 hrs HW=256.21' (Free Discharge)
├─**2=Culvert** (Inlet Controls 4.10 cfs @ 5.22 fps)
└─**3=Broad-Crested Rectangular Weir** (Weir Controls 7.18 cfs @ 1.14 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 =	0.32 cfs @	12.31 hrs,	Volume=	0.268 af	
Primary =	7.52 cfs @	12.31 hrs,	Volume=	0.643 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 268.34' @ 12.31 hrs Surf.Area= 5,727 sf Storage= 9,363 cf

Plug-Flow detention time= 52.8 min calculated for 0.910 af (100% of inflow)
Center-of-Mass det. time= 52.9 min (882.8 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	266.20'	16,732 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)
266.20	3,039	303.7	0	0	3,039
268.00	5,379	341.2	7,477	7,477	5,049
269.50	6,997	372.2	9,255	16,732	6,889

Device	Routing	Invert	Outlet Devices
#1	Discarded	266.20'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	266.50'	**6.0" Vert. Orifice/Grate** C= 0.600
#3	Primary	267.50'	**2.5' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.3' Crest Height
#4	Primary	268.50'	**12.0' long x 1.00' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s) 2.3' Crest Height

Discarded OutFlow Max=0.32 cfs @ 12.31 hrs HW=268.34' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.32 cfs)

Primary OutFlow Max=7.48 cfs @ 12.31 hrs HW=268.34' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 1.19 cfs @ 6.06 fps)
├─**3=Sharp-Crested Rectangular Weir** (Weir Controls 6.29 cfs @ 3.23 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

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)

Summary for Pond WQS1: Water Quality Swale 1

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 = 3.70 cfs @ 12.11 hrs, Volume= 0.281 af, Atten= 4%, Lag= 1.3 min
Primary = 3.70 cfs @ 12.11 hrs, Volume= 0.281 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 263.47' @ 12.12 hrs Surf.Area= 813 sf Storage= 947 cf

Plug-Flow detention time= 14.4 min calculated for 0.280 af (100% of inflow)
Center-of-Mass det. time= 15.4 min (830.0 - 814.6)

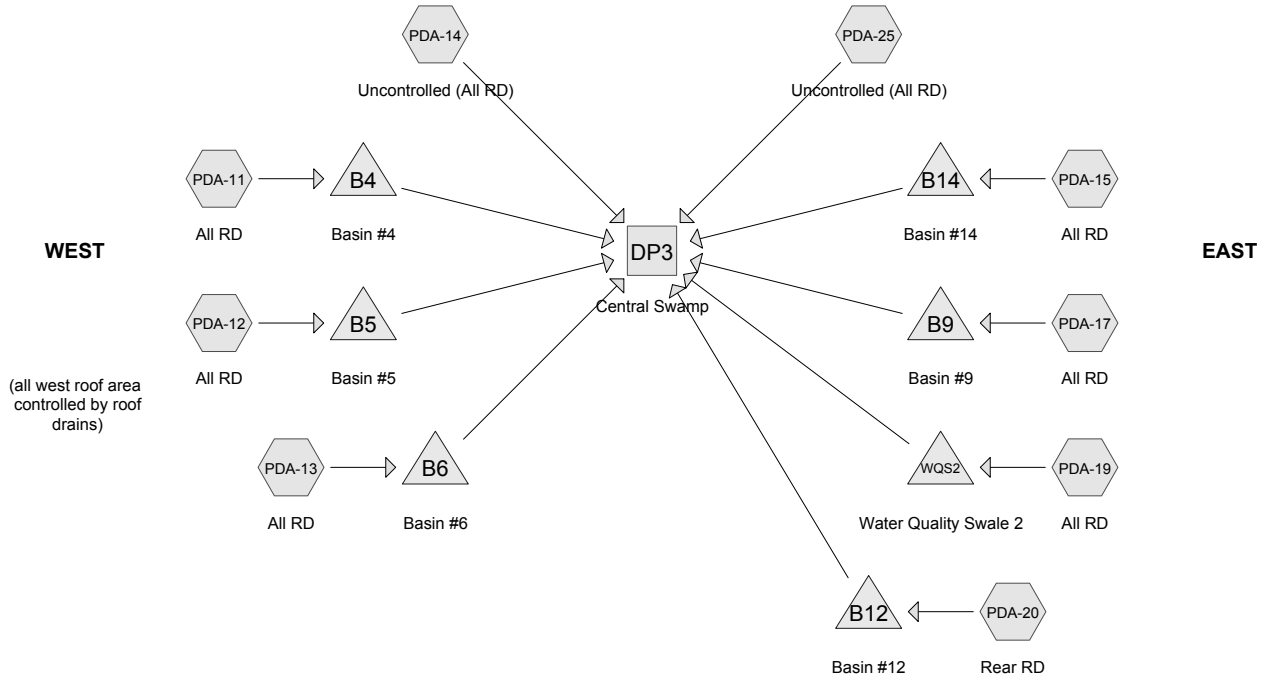
Volume	Invert	Avail.Storage	Storage Description
#1	261.90'	1,420 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

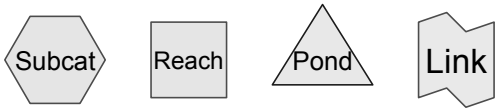
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
261.90	1	4.0	0	0	1
262.00	472	164.9	16	16	2,164
264.00	960	180.3	1,403	1,420	2,710

Device	Routing	Invert	Outlet Devices
#1	Primary	261.90'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir**
			Cv= 2.56 (C= 3.20)
#2	Primary	263.40'	**12.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

0.5' Crest Height

Primary OutFlow Max=3.55 cfs @ 12.11 hrs HW=263.45' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Orifice Controls 3.12 cfs @ 3.35 fps)
└─**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.43 cfs @ 0.73 fps)





Routing Diagram for OE2765-POST-CENTRAL-3.2.18
Prepared by Microsoft, Printed 3/28/2018
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
8.307	39	>75% Grass cover, Good, HSG A (PDA-11, PDA-12, PDA-13, PDA-14, PDA-15, PDA-17, PDA-19, PDA-25)
1.821	74	>75% Grass cover, Good, HSG C (PDA-14, PDA-20, PDA-25)
0.387	80	>75% Grass cover, Good, HSG D (PDA-13, PDA-19, PDA-25)
2.182	98	Paved parking, HSG A (PDA-11, PDA-12, PDA-13, PDA-14)
0.294	98	Pavement (PDA-15, PDA-25)
0.149	98	Unconnected roofs, HSG A (PDA-20)
10.229	30	Woods, Good, HSG A (PDA-11, PDA-12, PDA-13, PDA-14, PDA-25)
1.817	70	Woods, Good, HSG C (PDA-14, PDA-25)
6.898	77	Woods, Good, HSG D (PDA-14, PDA-25)
0.045	98	ex Roofs, HSG A (PDA-25)
0.060	98	ex roof (PDA-14)
0.057	98	ex. Driveway (PDA-15)
0.044	98	ex. drive (PDA-14)
1.225	98	roads,sidewalks, drives (PDA-17, PDA-19, PDA-20)
33.514	**55**	**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
8.307	0.000	1.821	0.387	0.000	10.515	>75% Grass cover, Good	PDA-11, PDA-12, PDA-13, PDA-14, PDA-15, PDA-17, PDA-19, PDA-20, PDA-25
2.182	0.000	0.000	0.000	0.000	2.182	Paved parking	PDA-11, PDA-12, PDA-13, PDA-14
0.000	0.000	0.000	0.000	0.294	0.294	Pavement	PDA-15, PDA-25
0.149	0.000	0.000	0.000	0.000	0.149	Unconnected roofs	PDA-20
10.229	0.000	1.817	6.898	0.000	18.944	Woods, Good	PDA-11, PDA-12, PDA-13, PDA-14, PDA-25
0.045	0.000	0.000	0.000	0.000	0.045	ex Roofs	PDA-25
0.000	0.000	0.000	0.000	0.060	0.060	ex roof	PDA-14
0.000	0.000	0.000	0.000	0.057	0.057	ex. Driveway	PDA-15
0.000	0.000	0.000	0.000	0.044	0.044	ex. drive	PDA-14
0.000	0.000	0.000	0.000	1.225	1.225	roads,sidewalks, drives	PDA-17, PDA-19, PDA-20
20.912	**0.000**	**3.638**	**7.285**	**1.680**	**33.514**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-11: All RD Runoff Area=117,009 sf 25.60% Impervious Runoff Depth=0.15"
Flow Length=248' Tc=14.3 min CN=51 Runoff=0.09 cfs 0.034 af

SubcatchmentPDA-12: All RD Runoff Area=57,063 sf 41.58% Impervious Runoff Depth=0.56"
Flow Length=512' Tc=8.9 min CN=64 Runoff=0.57 cfs 0.061 af

SubcatchmentPDA-13: All RD Runoff Area=119,587 sf 31.96% Impervious Runoff Depth=0.41"
Flow Length=460' Tc=11.0 min CN=60 Runoff=0.63 cfs 0.093 af

SubcatchmentPDA-14: Uncontrolled (All Runoff Area=354,154 sf 2.17% Impervious Runoff Depth=0.04"
Flow Length=237' Tc=14.2 min CN=45 Runoff=0.05 cfs 0.030 af

SubcatchmentPDA-15: All RD Runoff Area=44,153 sf 30.31% Impervious Runoff Depth=0.31"
Flow Length=225' Tc=16.1 min CN=57 Runoff=0.13 cfs 0.026 af

SubcatchmentPDA-17: All RD Runoff Area=34,860 sf 61.02% Impervious Runoff Depth=1.09"
Flow Length=124' Tc=6.0 min CN=75 Runoff=0.97 cfs 0.073 af

SubcatchmentPDA-19: All RD Runoff Area=34,114 sf 49.52% Impervious Runoff Depth=1.04"
Flow Length=232' Tc=5.5 min CN=74 Runoff=0.90 cfs 0.068 af

SubcatchmentPDA-20: Rear RD Runoff Area=44,547 sf 48.62% Impervious Runoff Depth=1.84"
Flow Length=311' Tc=7.1 min CN=86 Runoff=2.09 cfs 0.156 af

SubcatchmentPDA-25: Uncontrolled (All Runoff Area=654,404 sf 0.59% Impervious Runoff Depth=0.28"
Flow Length=820' Slope=0.0060 '/' Tc=53.1 min CN=56 Runoff=1.06 cfs 0.350 af

Reach DP3: Central Swamp Inflow=1.23 cfs 0.448 af
Outflow=1.23 cfs 0.448 af

Pond B12: Basin #12 Peak Elev=269.22' Storage=1,710 cf Inflow=2.09 cfs 0.156 af
Discarded=0.49 cfs 0.156 af Primary=0.00 cfs 0.000 af Outflow=0.49 cfs 0.156 af

Pond B14: Basin #14 Peak Elev=272.18' Storage=159 cf Inflow=0.13 cfs 0.026 af
Discarded=0.05 cfs 0.026 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.026 af

Pond B4: Basin #4 Peak Elev=272.51' Storage=33 cf Inflow=0.09 cfs 0.034 af
Discarded=0.07 cfs 0.034 af Primary=0.00 cfs 0.000 af Outflow=0.07 cfs 0.034 af

Pond B5: Basin #5 Peak Elev=271.57' Storage=332 cf Inflow=0.57 cfs 0.061 af
Discarded=0.28 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.061 af

Pond B6: Basin #6 Peak Elev=268.71' Storage=16 cf Inflow=0.63 cfs 0.093 af
Discarded=0.63 cfs 0.093 af Primary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.093 af

Pond B9: Basin #9 Peak Elev=273.34' Storage=1,528 cf Inflow=0.97 cfs 0.073 af
Discarded=0.06 cfs 0.073 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.073 af

Pond WQS2: Water Quality Swale 2 Peak Elev=270.53' Storage=563 cf Inflow=0.90 cfs 0.068 af
Outflow=0.49 cfs 0.068 af

Total Runoff Area = 33.514 ac Runoff Volume = 0.891 af Average Runoff Depth = 0.32"
87.90% Pervious = 29.459 ac 12.10% Impervious = 4.056 ac

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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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

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 = 0.13 cfs @ 12.44 hrs, Volume= 0.026 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	10,884	98	Pavement
	30,769	39	>75% Grass cover, Good, HSG A
*	2,500	98	ex. Driveway
	44,153	57	Weighted Average
	30,769		69.69% Pervious Area
	13,384		30.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0020	0.06		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.0	175	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.1	225	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 0.97 cfs @ 12.10 hrs, Volume= 0.073 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
*	21,271	98	roads,sidewalks, drives
	13,589	39	>75% Grass cover, Good, HSG A
	34,860	75	Weighted Average
	13,589		38.98% Pervious Area
	21,271		61.02% 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

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= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	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= 0.00-48.00 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 = 1.06 cfs @ 13.03 hrs, Volume= 0.350 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Yr Storm Rainfall=3.20"

	Area (sf)	CN	Description
	76,354	39	>75% Grass cover, Good, HSG A
	50,958	74	>75% Grass cover, Good, HSG C
	3,094	80	>75% Grass cover, Good, HSG D
	218,731	30	Woods, Good, HSG A
	75,889	70	Woods, Good, HSG C
	225,507	77	Woods, Good, HSG D
*	1,950	98	ex Roofs, HSG A
*	1,921	98	Pavement
	654,404	56	Weighted Average
	650,533		99.41% Pervious Area
	3,871		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
33.1	770	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
53.1	820	Total			

Summary for Reach DP3: Central Swamp

Inflow Area = 33.514 ac, 12.10% Impervious, Inflow Depth = 0.16" for 2-Yr Storm event
Inflow = 1.23 cfs @ 12.99 hrs, Volume= 0.448 af
Outflow = 1.23 cfs @ 12.99 hrs, Volume= 0.448 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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= 0.00-48.00 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)

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 B14: Basin #14

Inflow Area = 1.014 ac, 30.31% Impervious, Inflow Depth = 0.31" for 2-Yr Storm event
Inflow = 0.13 cfs @ 12.44 hrs, Volume= 0.026 af
Outflow = 0.05 cfs @ 13.21 hrs, Volume= 0.026 af, Atten= 62%, Lag= 45.8 min
Discarded = 0.05 cfs @ 13.21 hrs, Volume= 0.026 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 272.18' @ 13.21 hrs Surf.Area= 912 sf Storage= 159 cf

Plug-Flow detention time= 26.0 min calculated for 0.026 af (100% of inflow)
Center-of-Mass det. time= 25.9 min (975.0 - 949.1)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	6,087 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)
272.00	830	156.5	0	0	830
274.00	1,941	203.3	2,694	2,694	2,217
275.00	5,095	849.0	3,394	6,087	56,291

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	271.36'	**12.0" Round Culvert** L= 36.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 271.36' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Device 2	273.60'	**12.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.05 cfs @ 13.21 hrs HW=272.18' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=272.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 1.28 cfs potential flow)
└─**3=Orifice/Grate** (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	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 272.51' @ 12.72 hrs Surf.Area= 4,290 sf Storage= 33 cf

Plug-Flow detention time= 7.4 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= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 271.57' @ 12.51 hrs Surf.Area= 5,030 sf Storage= 332 cf

Plug-Flow detention time= 11.0 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= 1.0 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= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 268.71' @ 12.25 hrs Surf.Area= 2,698 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 = 0.800 ac, 61.02% Impervious, Inflow Depth = 1.09" for 2-Yr Storm event
Inflow = 0.97 cfs @ 12.10 hrs, Volume= 0.073 af
Outflow = 0.06 cfs @ 14.99 hrs, Volume= 0.073 af, Atten= 94%, Lag= 173.6 min
Discarded = 0.06 cfs @ 14.99 hrs, Volume= 0.073 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 273.34' @ 14.99 hrs Surf.Area= 2,609 sf Storage= 1,528 cf

Plug-Flow detention time= 278.0 min calculated for 0.073 af (100% of inflow)
Center-of-Mass det. time= 277.9 min (1,136.8 - 858.8)

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 @ 14.99 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 Pond WQS2: Water Quality Swale 2

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 = 0.49 cfs @ 12.26 hrs, Volume= 0.068 af, Atten= 46%, Lag= 10.2 min
Primary = 0.49 cfs @ 12.26 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 270.53' @ 12.26 hrs Surf.Area= 1,084 sf Storage= 563 cf

Plug-Flow detention time= 35.2 min calculated for 0.068 af (100% of inflow)
Center-of-Mass det. time= 35.3 min (896.9 - 861.6)

Volume	Invert	Avail.Storage	Storage Description
#1	269.80'	8,515 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)
269.80	1	4.0	0	0	1
270.00	828	163.0	57	57	2,114
272.00	1,970	199.5	2,717	2,774	3,228
274.00	3,878	295.0	5,741	8,515	7,018

Device	Routing	Invert	Outlet Devices
#1	Primary	269.80'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Primary	271.30'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=0.48 cfs @ 12.26 hrs HW=270.53' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.48 cfs @ 2.19 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-11: All RD Runoff Area=117,009 sf 25.60% Impervious Runoff Depth=0.62"
Flow Length=248' Tc=14.3 min CN=51 Runoff=0.92 cfs 0.140 af

SubcatchmentPDA-12: All RD Runoff Area=57,063 sf 41.58% Impervious Runoff Depth=1.39"
Flow Length=512' Tc=8.9 min CN=64 Runoff=1.76 cfs 0.152 af

SubcatchmentPDA-13: All RD Runoff Area=119,587 sf 31.96% Impervious Runoff Depth=1.13"
Flow Length=460' Tc=11.0 min CN=60 Runoff=2.65 cfs 0.258 af

SubcatchmentPDA-14: Uncontrolled (All Runoff Area=354,154 sf 2.17% Impervious Runoff Depth=0.35"
Flow Length=237' Tc=14.2 min CN=45 Runoff=1.04 cfs 0.238 af

SubcatchmentPDA-15: All RD Runoff Area=44,153 sf 30.31% Impervious Runoff Depth=0.95"
Flow Length=225' Tc=16.1 min CN=57 Runoff=0.66 cfs 0.080 af

SubcatchmentPDA-17: All RD Runoff Area=34,860 sf 61.02% Impervious Runoff Depth=2.21"
Flow Length=124' Tc=6.0 min CN=75 Runoff=2.02 cfs 0.147 af

SubcatchmentPDA-19: All RD Runoff Area=34,114 sf 49.52% Impervious Runoff Depth=2.13"
Flow Length=232' Tc=5.5 min CN=74 Runoff=1.92 cfs 0.139 af

SubcatchmentPDA-20: Rear RD Runoff Area=44,547 sf 48.62% Impervious Runoff Depth=3.19"
Flow Length=311' Tc=7.1 min CN=86 Runoff=3.59 cfs 0.272 af

SubcatchmentPDA-25: Uncontrolled (All Runoff Area=654,404 sf 0.59% Impervious Runoff Depth=0.89"
Flow Length=820' Slope=0.0060 '/' Tc=53.1 min CN=56 Runoff=5.27 cfs 1.115 af

Reach DP3: Central Swamp Inflow=6.22 cfs 1.499 af
Outflow=6.22 cfs 1.499 af

Pond B12: Basin #12 Peak Elev=269.97' Storage=3,796 cf Inflow=3.59 cfs 0.272 af
Discarded=0.58 cfs 0.272 af Primary=0.00 cfs 0.000 af Outflow=0.58 cfs 0.272 af

Pond B14: Basin #14 Peak Elev=273.24' Storage=1,407 cf Inflow=0.66 cfs 0.080 af
Discarded=0.08 cfs 0.080 af Primary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.080 af

Pond B4: Basin #4 Peak Elev=272.77' Storage=1,223 cf Inflow=0.92 cfs 0.140 af
Discarded=0.26 cfs 0.140 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.140 af

Pond B5: Basin #5 Peak Elev=271.89' Storage=2,003 cf Inflow=1.76 cfs 0.152 af
Discarded=0.30 cfs 0.152 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.152 af

Pond B6: Basin #6 Peak Elev=268.74' Storage=110 cf Inflow=2.65 cfs 0.258 af
Discarded=2.41 cfs 0.259 af Primary=0.00 cfs 0.000 af Outflow=2.41 cfs 0.259 af

Pond B9: Basin #9 Peak Elev=274.08' Storage=3,660 cf Inflow=2.02 cfs 0.147 af
Discarded=0.07 cfs 0.141 af Primary=0.03 cfs 0.007 af Outflow=0.11 cfs 0.147 af

Pond WQS2: Water Quality Swale 2 Peak Elev=270.89' Storage=985 cf Inflow=1.92 cfs 0.139 af
Outflow=1.31 cfs 0.139 af

Total Runoff Area = 33.514 ac Runoff Volume = 2.541 af Average Runoff Depth = 0.91"
87.90% Pervious = 29.459 ac 12.10% Impervious = 4.056 ac

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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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

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 = 0.66 cfs @ 12.27 hrs, Volume= 0.080 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	10,884	98	Pavement
	30,769	39	>75% Grass cover, Good, HSG A
*	2,500	98	ex. Driveway
	44,153	57	Weighted Average
	30,769		69.69% Pervious Area
	13,384		30.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0020	0.06		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.0	175	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.1	225	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 2.02 cfs @ 12.09 hrs, Volume= 0.147 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
*	21,271	98	roads,sidewalks, drives
	13,589	39	>75% Grass cover, Good, HSG A
	34,860	75	Weighted Average
	13,589		38.98% Pervious Area
	21,271		61.02% 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

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= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	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= 0.00-48.00 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 = 5.27 cfs @ 12.85 hrs, Volume= 1.115 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Yr Storm Rainfall=4.70"

	Area (sf)	CN	Description
	76,354	39	>75% Grass cover, Good, HSG A
	50,958	74	>75% Grass cover, Good, HSG C
	3,094	80	>75% Grass cover, Good, HSG D
	218,731	30	Woods, Good, HSG A
	75,889	70	Woods, Good, HSG C
	225,507	77	Woods, Good, HSG D
*	1,950	98	ex Roofs, HSG A
*	1,921	98	Pavement
	654,404	56	Weighted Average
	650,533		99.41% Pervious Area
	3,871		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
33.1	770	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
53.1	820	Total			

Summary for Reach DP3: Central Swamp

Inflow Area = 33.514 ac, 12.10% Impervious, Inflow Depth = 0.54" for 10-Yr Storm event
Inflow = 6.22 cfs @ 12.81 hrs, Volume= 1.499 af
Outflow = 6.22 cfs @ 12.81 hrs, Volume= 1.499 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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= 0.00-48.00 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)

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 B14: Basin #14

Inflow Area =	1.014 ac,	30.31% Impervious,	Inflow Depth =	0.95"	for 10-Yr Storm event
Inflow =	0.66 cfs @	12.27 hrs,	Volume=	0.080 af	
Outflow =	0.08 cfs @	15.09 hrs,	Volume=	0.080 af,	Atten= 88%, Lag= 169.5 min
Discarded =	0.08 cfs @	15.09 hrs,	Volume=	0.080 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 273.24' @ 15.09 hrs Surf.Area= 1,465 sf Storage= 1,407 cf

Plug-Flow detention time= 210.3 min calculated for 0.080 af (100% of inflow)
Center-of-Mass det. time= 210.2 min (1,110.4 - 900.2)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	6,087 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)
272.00	830	156.5	0	0	830
274.00	1,941	203.3	2,694	2,694	2,217
275.00	5,095	849.0	3,394	6,087	56,291

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	271.36'	**12.0" Round Culvert** L= 36.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 271.36' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Device 2	273.60'	**12.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.08 cfs @ 15.09 hrs HW=273.24' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=272.00' (Free Discharge)
└─**2=Culvert** (Passes 0.00 cfs of 1.28 cfs potential flow)
└─**3=Orifice/Grate** (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	

Routing by Stor-Ind method, Time Span= 0.00-48.00 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 0.140 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= 0.00-48.00 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= 57.1 min calculated for 0.151 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= 0.259 af, Atten= 9%, Lag= 0.0 min
Discarded = 2.41 cfs @ 12.15 hrs, Volume= 0.259 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 268.74' @ 12.23 hrs Surf.Area= 2,724 sf Storage= 110 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.2 min (885.0 - 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 = 0.800 ac, 61.02% Impervious, Inflow Depth = 2.21" for 10-Yr Storm event
Inflow = 2.02 cfs @ 12.09 hrs, Volume= 0.147 af
Outflow = 0.11 cfs @ 15.11 hrs, Volume= 0.147 af, Atten= 95%, Lag= 180.6 min
Discarded = 0.07 cfs @ 15.11 hrs, Volume= 0.141 af
Primary = 0.03 cfs @ 15.11 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 274.08' @ 15.11 hrs Surf.Area= 3,175 sf Storage= 3,660 cf

Plug-Flow detention time= 517.8 min calculated for 0.147 af (100% of inflow)
Center-of-Mass det. time= 517.5 min (1,355.4 - 837.9)

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=0.07 cfs @ 15.11 hrs HW=274.08' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.03 cfs @ 15.11 hrs HW=274.08' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 0.96 fps)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WQS2: Water Quality Swale 2

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 = 1.31 cfs @ 12.18 hrs, Volume= 0.139 af, Atten= 32%, Lag= 5.5 min
Primary = 1.31 cfs @ 12.18 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 270.89' @ 12.18 hrs Surf.Area= 1,276 sf Storage= 985 cf

Plug-Flow detention time= 27.9 min calculated for 0.139 af (100% of inflow)
Center-of-Mass det. time= 28.1 min (868.1 - 840.1)

Volume	Invert	Avail.Storage	Storage Description
#1	269.80'	8,515 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)
269.80	1	4.0	0	0	1
270.00	828	163.0	57	57	2,114
272.00	1,970	199.5	2,717	2,774	3,228
274.00	3,878	295.0	5,741	8,515	7,018

Device	Routing	Invert	Outlet Devices
#1	Primary	269.80'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Primary	271.30'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=1.30 cfs @ 12.18 hrs HW=270.89' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.30 cfs @ 2.67 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment PDA-11: All RD Runoff Area=117,009 sf 25.60% Impervious Runoff Depth=0.97"
Flow Length=248' Tc=14.3 min CN=51 Runoff=1.74 cfs 0.217 af

Subcatchment PDA-12: All RD Runoff Area=57,063 sf 41.58% Impervious Runoff Depth=1.91"
Flow Length=512' Tc=8.9 min CN=64 Runoff=2.50 cfs 0.209 af

Subcatchment PDA-13: All RD Runoff Area=119,587 sf 31.96% Impervious Runoff Depth=1.60"
Flow Length=460' Tc=11.0 min CN=60 Runoff=3.99 cfs 0.367 af

Subcatchment PDA-14: Uncontrolled (All Runoff Area=354,154 sf 2.17% Impervious Runoff Depth=0.61"
Flow Length=237' Tc=14.2 min CN=45 Runoff=2.40 cfs 0.414 af

Subcatchment PDA-15: All RD Runoff Area=44,153 sf 30.31% Impervious Runoff Depth=1.38"
Flow Length=225' Tc=16.1 min CN=57 Runoff=1.05 cfs 0.117 af

Subcatchment PDA-17: All RD Runoff Area=34,860 sf 61.02% Impervious Runoff Depth=2.86"
Flow Length=124' Tc=6.0 min CN=75 Runoff=2.63 cfs 0.191 af

Subcatchment PDA-19: All RD Runoff Area=34,114 sf 49.52% Impervious Runoff Depth=2.77"
Flow Length=232' Tc=5.5 min CN=74 Runoff=2.52 cfs 0.181 af

Subcatchment PDA-20: Rear RD Runoff Area=44,547 sf 48.62% Impervious Runoff Depth=3.94"
Flow Length=311' Tc=7.1 min CN=86 Runoff=4.40 cfs 0.335 af

Subcatchment PDA-25: Uncontrolled (All Runoff Area=654,404 sf 0.59% Impervious Runoff Depth=1.31"
Flow Length=820' Slope=0.0060 '/' Tc=53.1 min CN=56 Runoff=8.44 cfs 1.639 af

Reach DP3: Central Swamp Inflow=10.18 cfs 2.284 af
Outflow=10.18 cfs 2.284 af

Pond B12: Basin #12 Peak Elev=270.34' Storage=4,985 cf Inflow=4.40 cfs 0.335 af
Discarded=0.63 cfs 0.335 af Primary=0.00 cfs 0.000 af Outflow=0.63 cfs 0.335 af

Pond B14: Basin #14 Peak Elev=273.67' Storage=2,095 cf Inflow=1.05 cfs 0.117 af
Discarded=0.10 cfs 0.107 af Primary=0.06 cfs 0.009 af Outflow=0.16 cfs 0.117 af

Pond B4: Basin #4 Peak Elev=273.14' Storage=2,991 cf Inflow=1.74 cfs 0.217 af
Discarded=0.28 cfs 0.217 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.217 af

Pond B5: Basin #5 Peak Elev=272.13' Storage=3,282 cf Inflow=2.50 cfs 0.209 af
Discarded=0.31 cfs 0.209 af Primary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.209 af

Pond B6: Basin #6 Peak Elev=269.07' Storage=1,052 cf Inflow=3.99 cfs 0.367 af
Discarded=2.41 cfs 0.365 af Primary=0.01 cfs 0.000 af Outflow=2.42 cfs 0.365 af

Pond B9: Basin #9 Peak Elev=274.21' Storage=4,078 cf Inflow=2.63 cfs 0.191 af
Discarded=0.08 cfs 0.150 af Primary=0.18 cfs 0.041 af Outflow=0.26 cfs 0.191 af

Pond WQS2: Water Quality Swale 2 Peak Elev=271.05' Storage=1,193 cf Inflow=2.52 cfs 0.181 af
Outflow=1.84 cfs 0.181 af

Total Runoff Area = 33.514 ac Runoff Volume = 3.670 af Average Runoff Depth = 1.31"
87.90% Pervious = 29.459 ac 12.10% Impervious = 4.056 ac

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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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

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 = 1.05 cfs @ 12.26 hrs, Volume= 0.117 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	10,884	98	Pavement
	30,769	39	>75% Grass cover, Good, HSG A
*	2,500	98	ex. Driveway
	44,153	57	Weighted Average
	30,769		69.69% Pervious Area
	13,384		30.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0020	0.06		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.0	175	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.1	225	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 2.63 cfs @ 12.09 hrs, Volume= 0.191 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
*	21,271	98	roads,sidewalks, drives
	13,589	39	>75% Grass cover, Good, HSG A
	34,860	75	Weighted Average
	13,589		38.98% Pervious Area
	21,271		61.02% 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

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= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	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= 0.00-48.00 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 = 8.44 cfs @ 12.82 hrs, Volume= 1.639 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-Hr 25-yr Rainfall=5.50"

	Area (sf)	CN	Description
	76,354	39	>75% Grass cover, Good, HSG A
	50,958	74	>75% Grass cover, Good, HSG C
	3,094	80	>75% Grass cover, Good, HSG D
	218,731	30	Woods, Good, HSG A
	75,889	70	Woods, Good, HSG C
	225,507	77	Woods, Good, HSG D
*	1,950	98	ex Roofs, HSG A
*	1,921	98	Pavement
	654,404	56	Weighted Average
	650,533		99.41% Pervious Area
	3,871		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
33.1	770	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
53.1	820	Total			

Summary for Reach DP3: Central Swamp

Inflow Area = 33.514 ac, 12.10% Impervious, Inflow Depth = 0.82" for 25-yr event
Inflow = 10.18 cfs @ 12.78 hrs, Volume= 2.284 af
Outflow = 10.18 cfs @ 12.78 hrs, Volume= 2.284 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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= 0.00-48.00 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)

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 B14: Basin #14

Inflow Area =	1.014 ac,	30.31% Impervious,	Inflow Depth =	1.38"	for 25-yr event
Inflow =	1.05 cfs @	12.26 hrs,	Volume=	0.117 af	
Outflow =	0.16 cfs @	13.74 hrs,	Volume=	0.117 af,	Atten= 85%, Lag= 89.1 min
Discarded =	0.10 cfs @	13.74 hrs,	Volume=	0.107 af	
Primary =	0.06 cfs @	13.74 hrs,	Volume=	0.009 af	

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 273.67' @ 13.74 hrs Surf.Area= 1,728 sf Storage= 2,095 cf

Plug-Flow detention time= 250.5 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 250.5 min (1,137.4 - 886.9)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	6,087 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)
272.00	830	156.5	0	0	830
274.00	1,941	203.3	2,694	2,694	2,217
275.00	5,095	849.0	3,394	6,087	56,291

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	271.36'	**12.0" Round Culvert** L= 36.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 271.36' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Device 2	273.60'	**12.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.10 cfs @ 13.74 hrs HW=273.67' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.10 cfs)

Primary OutFlow Max=0.06 cfs @ 13.74 hrs HW=273.67' (Free Discharge)
└─**2=Culvert** (Passes 0.06 cfs of 4.49 cfs potential flow)
└─**3=Orifice/Grate** (Orifice Controls 0.06 cfs @ 0.87 fps)

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	

Routing by Stor-Ind method, Time Span= 0.00-48.00 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= 109.3 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= 0.00-48.00 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= 100.1 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= 0.365 af, Atten= 39%, Lag= 13.5 min
Discarded = 2.41 cfs @ 12.10 hrs, Volume= 0.365 af
Primary = 0.01 cfs @ 12.39 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 269.07' @ 12.39 hrs Surf.Area= 2,979 sf Storage= 1,052 cf

Plug-Flow detention time= 5.5 min calculated for 0.365 af (99% of inflow)
Center-of-Mass det. time= 2.5 min (875.8 - 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=269.07' (Free Discharge)
├─**1=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.90 fps)
└─**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond B9: Basin #9

Inflow Area = 0.800 ac, 61.02% Impervious, Inflow Depth = 2.86" for 25-yr event
Inflow = 2.63 cfs @ 12.09 hrs, Volume= 0.191 af
Outflow = 0.26 cfs @ 13.06 hrs, Volume= 0.191 af, Atten= 90%, Lag= 58.1 min
Discarded = 0.08 cfs @ 13.06 hrs, Volume= 0.150 af
Primary = 0.18 cfs @ 13.06 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 274.21' @ 13.06 hrs Surf.Area= 3,293 sf Storage= 4,078 cf

Plug-Flow detention time= 441.5 min calculated for 0.191 af (100% of inflow)
Center-of-Mass det. time= 441.9 min (1,272.3 - 830.4)

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=0.08 cfs @ 13.06 hrs HW=274.21' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.18 cfs @ 13.06 hrs HW=274.21' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.18 cfs @ 1.56 fps)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WQS2: Water Quality Swale 2

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 = 1.84 cfs @ 12.17 hrs, Volume= 0.181 af, Atten= 27%, Lag= 4.8 min
Primary = 1.84 cfs @ 12.17 hrs, Volume= 0.181 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 271.05' @ 12.17 hrs Surf.Area= 1,365 sf Storage= 1,193 cf

Plug-Flow detention time= 25.6 min calculated for 0.181 af (100% of inflow)
Center-of-Mass det. time= 25.7 min (858.1 - 832.4)

Volume	Invert	Avail.Storage	Storage Description
#1	269.80'	8,515 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)
269.80	1	4.0	0	0	1
270.00	828	163.0	57	57	2,114
272.00	1,970	199.5	2,717	2,774	3,228
274.00	3,878	295.0	5,741	8,515	7,018

Device	Routing	Invert	Outlet Devices
#1	Primary	269.80'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Primary	271.30'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=1.81 cfs @ 12.17 hrs HW=271.04' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.81 cfs @ 2.85 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-11: All RD Runoff Area=117,009 sf 25.60% Impervious Runoff Depth=1.59"
Flow Length=248' Tc=14.3 min CN=51 Runoff=3.27 cfs 0.355 af

SubcatchmentPDA-12: All RD Runoff Area=57,063 sf 41.58% Impervious Runoff Depth=2.78"
Flow Length=512' Tc=8.9 min CN=64 Runoff=3.72 cfs 0.303 af

SubcatchmentPDA-13: All RD Runoff Area=119,587 sf 31.96% Impervious Runoff Depth=2.39"
Flow Length=460' Tc=11.0 min CN=60 Runoff=6.22 cfs 0.548 af

SubcatchmentPDA-14: Uncontrolled (All Runoff Area=354,154 sf 2.17% Impervious Runoff Depth=1.10"
Flow Length=237' Tc=14.2 min CN=45 Runoff=5.73 cfs 0.745 af

SubcatchmentPDA-15: All RD Runoff Area=44,153 sf 30.31% Impervious Runoff Depth=2.12"
Flow Length=225' Tc=16.1 min CN=57 Runoff=1.72 cfs 0.179 af

SubcatchmentPDA-17: All RD Runoff Area=34,860 sf 61.02% Impervious Runoff Depth=3.89"
Flow Length=124' Tc=6.0 min CN=75 Runoff=3.57 cfs 0.259 af

SubcatchmentPDA-19: All RD Runoff Area=34,114 sf 49.52% Impervious Runoff Depth=3.78"
Flow Length=232' Tc=5.5 min CN=74 Runoff=3.44 cfs 0.247 af

SubcatchmentPDA-20: Rear RD Runoff Area=44,547 sf 48.62% Impervious Runoff Depth=5.08"
Flow Length=311' Tc=7.1 min CN=86 Runoff=5.61 cfs 0.433 af

SubcatchmentPDA-25: Uncontrolled (All Runoff Area=654,404 sf 0.59% Impervious Runoff Depth=2.03"
Flow Length=820' Slope=0.0060 '/' Tc=53.1 min CN=56 Runoff=13.96 cfs 2.536 af

Reach DP3: Central Swamp Inflow=17.92 cfs 3.687 af
Outflow=17.92 cfs 3.687 af

Pond B12: Basin #12 Peak Elev=270.88' Storage=6,872 cf Inflow=5.61 cfs 0.433 af
Discarded=0.70 cfs 0.433 af Primary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.433 af

Pond B14: Basin #14 Peak Elev=273.92' Storage=2,548 cf Inflow=1.72 cfs 0.179 af
Discarded=0.11 cfs 0.122 af Primary=0.59 cfs 0.057 af Outflow=0.70 cfs 0.179 af

Pond B4: Basin #4 Peak Elev=273.80' Storage=6,649 cf Inflow=3.27 cfs 0.355 af
Discarded=0.34 cfs 0.355 af Primary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.355 af

Pond B5: Basin #5 Peak Elev=272.53' Storage=5,596 cf Inflow=3.72 cfs 0.303 af
Discarded=0.33 cfs 0.303 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.303 af

Pond B6: Basin #6 Peak Elev=269.82' Storage=3,518 cf Inflow=6.22 cfs 0.548 af
Discarded=2.41 cfs 0.540 af Primary=0.09 cfs 0.005 af Outflow=2.50 cfs 0.546 af

Pond B9: Basin #9 Peak Elev=274.51' Storage=5,099 cf Inflow=3.57 cfs 0.259 af
Discarded=0.08 cfs 0.161 af Primary=0.49 cfs 0.098 af Outflow=0.57 cfs 0.259 af

Pond WQS2: Water Quality Swale 2 Peak Elev=271.24' Storage=1,469 cf Inflow=3.44 cfs 0.247 af
Outflow=2.64 cfs 0.247 af

Total Runoff Area = 33.514 ac Runoff Volume = 5.604 af Average Runoff Depth = 2.01"
87.90% Pervious = 29.459 ac 12.10% Impervious = 4.056 ac

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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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= 0.00-48.00 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

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 = 1.72 cfs @ 12.24 hrs, Volume= 0.179 af, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	10,884	98	Pavement
	30,769	39	>75% Grass cover, Good, HSG A
*	2,500	98	ex. Driveway
	44,153	57	Weighted Average
	30,769		69.69% Pervious Area
	13,384		30.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	50	0.0020	0.06		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.20"
2.0	175	0.0080	1.44		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
16.1	225	Total			

Summary for Subcatchment PDA-17: All RD

Runoff = 3.57 cfs @ 12.09 hrs, Volume= 0.259 af, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
*	21,271	98	roads,sidewalks, drives
	13,589	39	>75% Grass cover, Good, HSG A
	34,860	75	Weighted Average
	13,589		38.98% Pervious Area
	21,271		61.02% 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

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= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	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= 0.00-48.00 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 = 13.96 cfs @ 12.79 hrs, Volume= 2.536 af, Depth= 2.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Yr Storm Rainfall=6.70"

	Area (sf)	CN	Description
	76,354	39	>75% Grass cover, Good, HSG A
	50,958	74	>75% Grass cover, Good, HSG C
	3,094	80	>75% Grass cover, Good, HSG D
	218,731	30	Woods, Good, HSG A
	75,889	70	Woods, Good, HSG C
	225,507	77	Woods, Good, HSG D
*	1,950	98	ex Roofs, HSG A
*	1,921	98	Pavement
	654,404	56	Weighted Average
	650,533		99.41% Pervious Area
	3,871		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0	50	0.0060	0.04		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.20"
33.1	770	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
53.1	820	Total			

Summary for Reach DP3: Central Swamp

Inflow Area = 33.514 ac, 12.10% Impervious, Inflow Depth = 1.32" for 100-Yr Storm event
Inflow = 17.92 cfs @ 12.69 hrs, Volume= 3.687 af
Outflow = 17.92 cfs @ 12.69 hrs, Volume= 3.687 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

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= 0.00-48.00 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 0.432 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)

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 B14: Basin #14

Inflow Area = 1.014 ac, 30.31% Impervious, Inflow Depth = 2.12" for 100-Yr Storm event
Inflow = 1.72 cfs @ 12.24 hrs, Volume= 0.179 af
Outflow = 0.70 cfs @ 12.66 hrs, Volume= 0.179 af, Atten= 59%, Lag= 25.0 min
Discarded = 0.11 cfs @ 12.66 hrs, Volume= 0.122 af
Primary = 0.59 cfs @ 12.66 hrs, Volume= 0.057 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 273.92' @ 12.66 hrs Surf.Area= 1,890 sf Storage= 2,548 cf

Plug-Flow detention time= 196.8 min calculated for 0.179 af (100% of inflow)
Center-of-Mass det. time= 196.7 min (1,069.7 - 873.0)

Volume	Invert	Avail.Storage	Storage Description
#1	272.00'	6,087 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)
272.00	830	156.5	0	0	830
274.00	1,941	203.3	2,694	2,694	2,217
275.00	5,095	849.0	3,394	6,087	56,291

Device	Routing	Invert	Outlet Devices
#1	Discarded	272.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	271.36'	**12.0" Round Culvert** L= 36.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 271.36' / 271.00' S= 0.0100 '/' Cc= 0.900 n= 0.011 Concrete pipe, straight & clean, Flow Area= 0.79 sf
#3	Device 2	273.60'	**12.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600

Discarded OutFlow Max=0.11 cfs @ 12.66 hrs HW=273.92' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.59 cfs @ 12.66 hrs HW=273.92' (Free Discharge)
└─**2=Culvert** (Passes 0.59 cfs of 4.79 cfs potential flow)
└─**3=Orifice/Grate** (Orifice Controls 0.59 cfs @ 1.82 fps)

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

Routing by Stor-Ind method, Time Span= 0.00-48.00 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= 231.5 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= 0.00-48.00 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

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= 0.546 af, Atten= 60%, Lag= 21.5 min
Discarded = 2.41 cfs @ 12.05 hrs, Volume= 0.540 af
Primary = 0.09 cfs @ 12.52 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 269.82' @ 12.52 hrs Surf.Area= 3,599 sf Storage= 3,518 cf

Plug-Flow detention time= 9.4 min calculated for 0.545 af (100% of inflow)
Center-of-Mass det. time= 7.2 min (867.9 - 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 = 0.800 ac, 61.02% Impervious, Inflow Depth = 3.89" for 100-Yr Storm event
Inflow = 3.57 cfs @ 12.09 hrs, Volume= 0.259 af
Outflow = 0.57 cfs @ 12.60 hrs, Volume= 0.259 af, Atten= 84%, Lag= 30.5 min
Discarded = 0.08 cfs @ 12.60 hrs, Volume= 0.161 af
Primary = 0.49 cfs @ 12.60 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 274.51' @ 12.60 hrs Surf.Area= 3,572 sf Storage= 5,099 cf

Plug-Flow detention time= 360.9 min calculated for 0.259 af (100% of inflow)
Center-of-Mass det. time= 360.6 min (1,182.2 - 821.6)

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 @ 12.60 hrs HW=274.51' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.49 cfs @ 12.60 hrs HW=274.51' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.49 cfs @ 2.81 fps)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond WQS2: Water Quality Swale 2

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 = 2.64 cfs @ 12.16 hrs, Volume= 0.247 af, Atten= 23%, Lag= 4.3 min
Primary = 2.64 cfs @ 12.16 hrs, Volume= 0.247 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 271.24' @ 12.16 hrs Surf.Area= 1,479 sf Storage= 1,469 cf

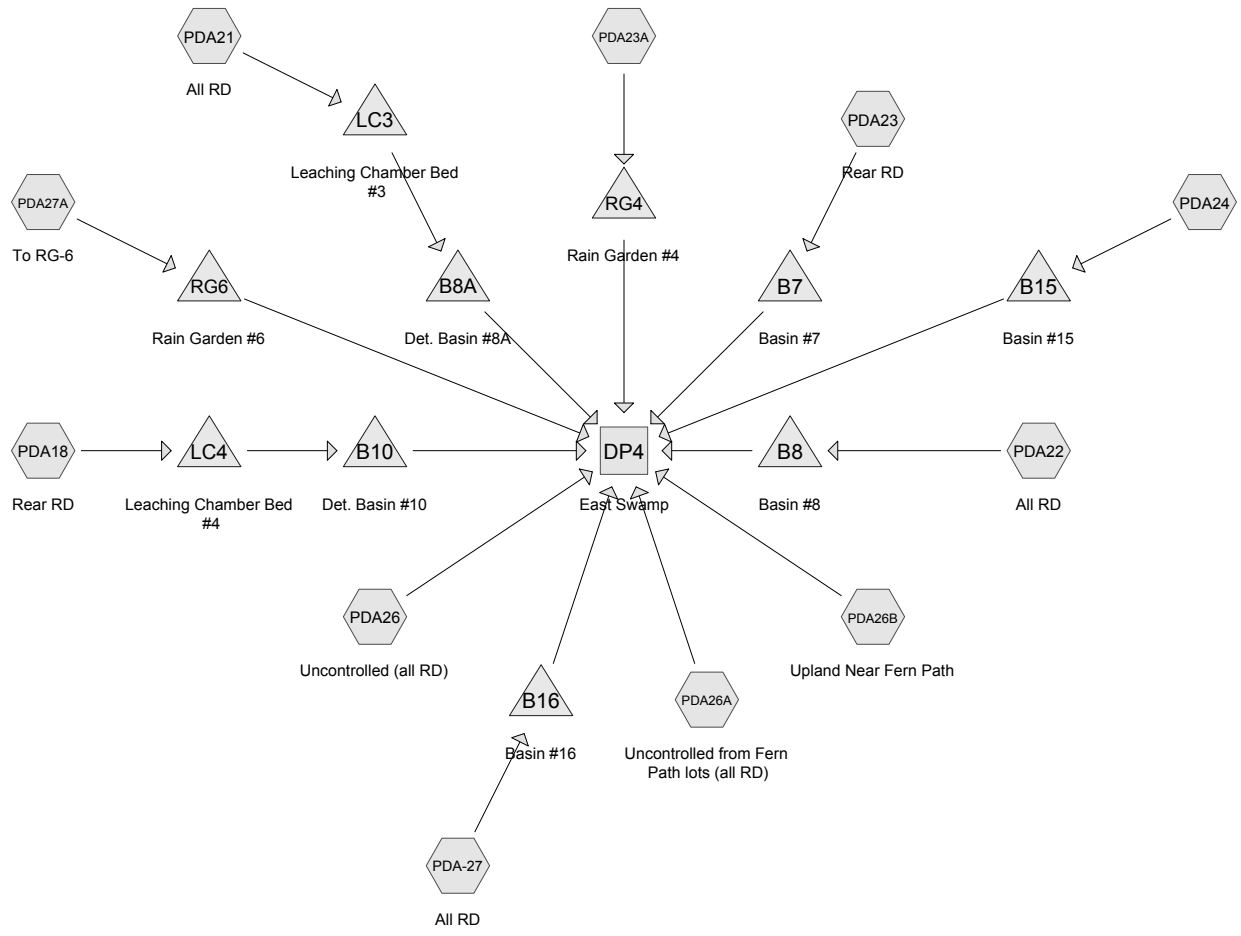
Plug-Flow detention time= 23.0 min calculated for 0.247 af (100% of inflow)
Center-of-Mass det. time= 23.2 min (846.6 - 823.4)

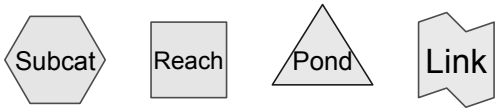
Volume	Invert	Avail.Storage	Storage Description
#1	269.80'	8,515 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
269.80	1	4.0	0	0	1
270.00	828	163.0	57	57	2,114
272.00	1,970	199.5	2,717	2,774	3,228
274.00	3,878	295.0	5,741	8,515	7,018

Device	Routing	Invert	Outlet Devices
#1	Primary	269.80'	**45.0 deg x 1.50' rise Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Primary	271.30'	**15.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 0.5' Crest Height

Primary OutFlow Max=2.61 cfs @ 12.16 hrs HW=271.23' (Free Discharge)
└─**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.61 cfs @ 3.07 fps)
└─**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)





Routing Diagram for OE2765-POST-EAST-3.2.18
Prepared by Microsoft, Printed 3/28/2018
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.000	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)
2.297	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)
19.645	**58**	**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
7.000	0.000	1.543	0.154	0.000	8.697	>75% Grass cover, Good	PDA-27, PDA18, PDA21, PDA22, PDA23, PDA23A, PDA24, PDA26, PDA26A, PDA27A
0.063	0.000	0.000	0.000	0.000	0.063	Pavement	PDA24
0.279	0.000	0.000	0.000	0.000	0.279	Unconnected roofs	PDA18, PDA23
3.052	0.000	3.874	1.120	0.000	8.045	Woods, Good	PDA23A, PDA24, PDA26, PDA26A, PDA26B
0.000	0.000	0.000	0.000	0.103	0.103	lots 129 and 130 long drives	PDA26
2.297	0.000	0.112	0.048	0.000	2.458	roads, sidewalks, drives	PDA-27, PDA18, PDA21, PDA22,

Ground Covers (all nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
12.691	**0.000**	**5.529**	**1.322**	**0.103**	**19.645**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-27: All RD Runoff Area=17,780 sf 27.54% Impervious Runoff Depth=1.47"
Flow Length=115' Tc=6.1 min CN=81 Runoff=0.68 cfs 0.050 af

SubcatchmentPDA18: Rear RD Runoff Area=43,236 sf 49.57% Impervious Runoff Depth=0.73"
Flow Length=322' Tc=7.8 min CN=68 Runoff=0.67 cfs 0.061 af

SubcatchmentPDA21: All RD Runoff Area=53,075 sf 43.59% Impervious Runoff Depth=0.60"
Flow Length=260' Tc=7.3 min CN=65 Runoff=0.62 cfs 0.061 af

SubcatchmentPDA22: All RD Runoff Area=85,190 sf 42.31% Impervious Runoff Depth=0.60"
Flow Length=536' Tc=8.3 min CN=65 Runoff=0.97 cfs 0.098 af

SubcatchmentPDA23: Rear RD Runoff Area=63,488 sf 53.09% Impervious Runoff Depth=0.83"
Tc=6.0 min CN=70 Runoff=1.25 cfs 0.101 af

SubcatchmentPDA23A: Runoff Area=28,700 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=120' Tc=7.7 min CN=34 Runoff=0.00 cfs 0.000 af

SubcatchmentPDA24: Runoff Area=25,508 sf 10.68% Impervious Runoff Depth=0.03"
Tc=6.0 min CN=44 Runoff=0.00 cfs 0.002 af

SubcatchmentPDA26: Uncontrolled (all Runoff Area=345,710 sf 1.30% Impervious Runoff Depth=0.04"
Flow Length=500' Tc=10.9 min CN=45 Runoff=0.04 cfs 0.029 af

SubcatchmentPDA26A: Uncontrolled from Runoff Area=91,805 sf 0.00% Impervious Runoff Depth=0.93"
Flow Length=275' Tc=27.5 min CN=72 Runoff=1.24 cfs 0.163 af

SubcatchmentPDA26B: Upland Near Fern Runoff Area=93,440 sf 0.00% Impervious Runoff Depth=0.88"
Flow Length=170' Tc=16.3 min CN=71 Runoff=1.45 cfs 0.157 af

SubcatchmentPDA27A: To RG-6 Runoff Area=7,800 sf 0.00% Impervious Runoff Depth=1.04"
Flow Length=140' Tc=4.5 min CN=74 Runoff=0.21 cfs 0.015 af

Reach DP4: East Swamp Inflow=2.54 cfs 0.386 af
Outflow=2.54 cfs 0.386 af

Pond B10: Det. Basin #10 Peak Elev=270.07' Storage=521 cf Inflow=0.40 cfs 0.037 af
Outflow=0.07 cfs 0.037 af

Pond B15: Basin #15 Peak Elev=264.00' Storage=2 cf Inflow=0.00 cfs 0.002 af
Discarded=0.00 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond B16: Basin #16 Peak Elev=272.22' Storage=410 cf Inflow=0.68 cfs 0.050 af
Discarded=0.22 cfs 0.050 af Primary=0.03 cfs 0.000 af Outflow=0.24 cfs 0.050 af

Pond B7: Basin #7 Peak Elev=261.39' Storage=1,295 cf Inflow=1.25 cfs 0.101 af
Discarded=0.19 cfs 0.101 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.101 af

Pond B8: Basin #8 Peak Elev=265.52' Storage=988 cf Inflow=0.97 cfs 0.098 af
Discarded=0.23 cfs 0.098 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.098 af

Pond B8A: Det. Basin #8A Peak Elev=270.20' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond LC3: Leaching Chamber Bed #3 Peak Elev=272.09' Storage=0.016 af Inflow=0.62 cfs 0.061 af
Discarded=0.11 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.11 cfs 0.061 af

Pond LC4: Leaching Chamber Bed #4 Peak Elev=271.57' Storage=0.012 af Inflow=0.67 cfs 0.061 af
Discarded=0.01 cfs 0.021 af Primary=0.40 cfs 0.037 af Outflow=0.41 cfs 0.058 af

Pond RG4: Rain Garden #4 Peak Elev=265.00' Storage=0 cf Inflow=0.00 cfs 0.000 af
Discarded=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond RG6: Rain Garden #6 Peak Elev=271.01' Storage=12 cf Inflow=0.21 cfs 0.015 af
Discarded=0.18 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.015 af

Total Runoff Area = 19.645 ac Runoff Volume = 0.736 af Average Runoff Depth = 0.45"
85.22% Pervious = 16.742 ac 14.78% Impervious = 2.903 ac

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 = 0.62 cfs @ 12.13 hrs, Volume= 0.061 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
*	23,137	98	roads, sidewalks, drives, HSG A
	29,938	39	>75% Grass cover, Good, HSG A
	53,075	65	Weighted Average
	29,938		56.41% Pervious Area
	23,137		43.59% 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

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:

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

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

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

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 Kv= 16.1 fps
4.5	140	Total			

Summary for Reach DP4: East Swamp

Inflow Area = 19.645 ac, 14.78% Impervious, Inflow Depth = 0.24" for 2-Yr Storm event
Inflow = 2.54 cfs @ 12.34 hrs, Volume= 0.386 af
Outflow = 2.54 cfs @ 12.34 hrs, Volume= 0.386 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 = 0.44" for 2-Yr Storm event
Inflow = 0.40 cfs @ 12.33 hrs, Volume= 0.037 af
Outflow = 0.07 cfs @ 13.67 hrs, Volume= 0.037 af, Atten= 82%, Lag= 80.1 min
Primary = 0.07 cfs @ 13.67 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 270.07' @ 13.67 hrs Surf.Area= 1,417 sf Storage= 521 cf

Plug-Flow detention time= 91.9 min calculated for 0.037 af (100% of inflow)
Center-of-Mass det. time= 92.0 min (956.4 - 864.4)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 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)
269.50	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=0.07 cfs @ 13.67 hrs HW=270.07' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.07 cfs @ 3.35 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' / 264.84' S= 0.0200 '/' 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 = 0.24 cfs @ 12.41 hrs, Volume= 0.050 af, Atten= 64%, Lag= 19.0 min
Discarded = 0.22 cfs @ 12.41 hrs, Volume= 0.050 af
Primary = 0.03 cfs @ 12.41 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 272.22' @ 12.41 hrs Surf.Area= 1,131 sf Storage= 410 cf

Plug-Flow detention time= 11.1 min calculated for 0.050 af (100% of inflow)
Center-of-Mass det. time= 11.1 min (850.7 - 839.6)

Volume	Invert	Avail.Storage	Storage Description
#1	271.80'	2,643 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)
271.80	877	136.2	0	0	877
272.00	960	140.0	184	184	965
273.50	2,431	218.3	2,459	2,643	3,214

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	272.20'	**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=0.22 cfs @ 12.41 hrs HW=272.22' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.02 cfs @ 12.41 hrs HW=272.22' (Free Discharge)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 0.02 cfs @ 0.30 fps)

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)

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 = 0.23 cfs @ 12.74 hrs, Volume= 0.098 af, Atten= 76%, Lag= 35.4 min
Discarded = 0.23 cfs @ 12.74 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= 265.52' @ 12.74 hrs Surf.Area= 1,223 sf Storage= 988 cf

Plug-Flow detention time= 35.4 min calculated for 0.098 af (100% of inflow)
Center-of-Mass det. time= 35.3 min (932.8 - 897.5)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,280 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	734	163.0	0	0	734
266.00	1,495	202.0	1,638	1,638	1,899
268.00	2,665	238.0	4,104	5,742	3,234
268.20	2,712	243.0	538	6,280	3,432

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=0.23 cfs @ 12.74 hrs HW=265.52' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.23 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 = 1.218 ac, 43.59% 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= 36 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'	4,378 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	36	36.0	0	0	36
271.00	275	265.0	109	109	5,523
272.00	1,068	285.0	628	738	6,440
274.00	2,696	313.0	3,641	4,378	7,901

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 = 1.218 ac, 43.59% Impervious, Inflow Depth = 0.60" for 2-Yr Storm event
Inflow = 0.62 cfs @ 12.13 hrs, Volume= 0.061 af
Outflow = 0.11 cfs @ 12.00 hrs, Volume= 0.061 af, Atten= 82%, Lag= 0.0 min
Discarded = 0.11 cfs @ 12.00 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 / 2

Peak Elev= 272.09' @ 13.06 hrs Surf.Area= 0.045 ac Storage= 0.016 af

Plug-Flow detention time= 53.7 min calculated for 0.061 af (100% of inflow)
Center-of-Mass det. time= 53.6 min (950.2 - 896.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.039 af	**11.33'W x 172.00'L x 3.21'H Field A** 0.144 af Overall - 0.047 af Embedded = 0.096 af x 40.0% Voids
#2A	271.90'	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
		0.086 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	273.80'	**6.0" Round Culvert X 4.00** L= 7.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.80' / 273.70' S= 0.0143 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 12.00 hrs HW=271.43' (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 =	0.41 cfs @	12.33 hrs,	Volume=	0.058 af,	Atten= 38%, Lag= 11.9 min
Discarded =	0.01 cfs @	11.80 hrs,	Volume=	0.021 af	
Primary =	0.40 cfs @	12.33 hrs,	Volume=	0.037 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 271.57' @ 12.33 hrs Surf.Area= 0.013 ac Storage= 0.012 af

Plug-Flow detention time= 145.0 min calculated for 0.058 af (95% of inflow)
Center-of-Mass det. time= 120.2 min (1,005.0 - 884.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.00'	0.011 af	**16.50'W x 35.50'L x 2.54'H Field A** 0.034 af Overall - 0.008 af Embedded = 0.027 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
		0.018 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	271.22'	**12.0" Round Culvert** L= 54.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 270.95' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 11.80 hrs HW=270.04' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.39 cfs @ 12.33 hrs HW=271.57' (Free Discharge)
└─**2=Culvert** (Barrel Controls 0.39 cfs @ 2.44 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)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-27: All RD Runoff Area=17,780 sf 27.54% Impervious Runoff Depth=2.72"
Flow Length=115' Tc=6.1 min CN=81 Runoff=1.27 cfs 0.093 af

SubcatchmentPDA18: Rear RD Runoff Area=43,236 sf 49.57% Impervious Runoff Depth=1.67"
Flow Length=322' Tc=7.8 min CN=68 Runoff=1.73 cfs 0.138 af

SubcatchmentPDA21: All RD Runoff Area=53,075 sf 43.59% Impervious Runoff Depth=1.46"
Flow Length=260' Tc=7.3 min CN=65 Runoff=1.84 cfs 0.148 af

SubcatchmentPDA22: All RD Runoff Area=85,190 sf 42.31% Impervious Runoff Depth=1.46"
Flow Length=536' Tc=8.3 min CN=65 Runoff=2.82 cfs 0.237 af

SubcatchmentPDA23: Rear RD Runoff Area=63,488 sf 53.09% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=70 Runoff=2.98 cfs 0.221 af

SubcatchmentPDA23A: Runoff Area=28,700 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=120' Tc=7.7 min CN=34 Runoff=0.00 cfs 0.002 af

SubcatchmentPDA24: Runoff Area=25,508 sf 10.68% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=44 Runoff=0.07 cfs 0.015 af

SubcatchmentPDA26: Uncontrolled (all Runoff Area=345,710 sf 1.30% Impervious Runoff Depth=0.35"
Flow Length=500' Tc=10.9 min CN=45 Runoff=1.06 cfs 0.232 af

SubcatchmentPDA26A: Uncontrolled from Runoff Area=91,805 sf 0.00% Impervious Runoff Depth=1.97"
Flow Length=275' Tc=27.5 min CN=72 Runoff=2.81 cfs 0.346 af

SubcatchmentPDA26B: Upland Near Fern Runoff Area=93,440 sf 0.00% Impervious Runoff Depth=1.89"
Flow Length=170' Tc=16.3 min CN=71 Runoff=3.38 cfs 0.338 af

SubcatchmentPDA27A: To RG-6 Runoff Area=7,800 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=140' Tc=4.5 min CN=74 Runoff=0.45 cfs 0.032 af

Reach DP4: East Swamp Inflow=7.83 cfs 1.107 af
Outflow=7.83 cfs 1.107 af

Pond B10: Det. Basin #10 Peak Elev=271.13' Storage=2,356 cf Inflow=1.64 cfs 0.113 af
Outflow=0.13 cfs 0.113 af

Pond B15: Basin #15 Peak Elev=264.09' Storage=51 cf Inflow=0.07 cfs 0.015 af
Discarded=0.03 cfs 0.015 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.015 af

Pond B16: Basin #16 Peak Elev=272.36' Storage=586 cf Inflow=1.27 cfs 0.093 af
Discarded=0.24 cfs 0.075 af Primary=0.78 cfs 0.017 af Outflow=1.02 cfs 0.093 af

Pond B7: Basin #7 Peak Elev=262.14' Storage=4,172 cf Inflow=2.98 cfs 0.221 af
Discarded=0.23 cfs 0.221 af Primary=0.00 cfs 0.000 af Outflow=0.23 cfs 0.221 af

Pond B8: Basin #8 Peak Elev=266.57' Storage=2,570 cf Inflow=2.82 cfs 0.237 af
Discarded=0.34 cfs 0.179 af Primary=0.83 cfs 0.059 af Outflow=1.17 cfs 0.237 af

Pond B8A: Det. Basin #8A Peak Elev=270.35' Storage=7 cf Inflow=0.02 cfs 0.002 af
Outflow=0.02 cfs 0.002 af

Pond LC3: Leaching Chamber Bed #3 Peak Elev=273.84' Storage=0.071 af Inflow=1.84 cfs 0.148 af
Discarded=0.11 cfs 0.146 af Primary=0.02 cfs 0.002 af Outflow=0.13 cfs 0.148 af

Pond LC4: Leaching Chamber Bed #4 Peak Elev=272.00' Storage=0.015 af Inflow=1.73 cfs 0.138 af
Discarded=0.01 cfs 0.022 af Primary=1.64 cfs 0.113 af Outflow=1.65 cfs 0.135 af

Pond RG4: Rain Garden #4 Peak Elev=265.00' Storage=0 cf Inflow=0.00 cfs 0.002 af
Discarded=0.00 cfs 0.002 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.002 af

Pond RG6: Rain Garden #6 Peak Elev=271.16' Storage=156 cf Inflow=0.45 cfs 0.032 af
Discarded=0.19 cfs 0.032 af Primary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.032 af

Total Runoff Area = 19.645 ac Runoff Volume = 1.802 af Average Runoff Depth = 1.10"
85.22% Pervious = 16.742 ac 14.78% Impervious = 2.903 ac

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 = 1.84 cfs @ 12.12 hrs, Volume= 0.148 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
*	23,137	98	roads, sidewalks, drives, HSG A
	29,938	39	>75% Grass cover, Good, HSG A
	53,075	65	Weighted Average
	29,938		56.41% Pervious Area
	23,137		43.59% 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

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

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

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

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

Inflow Area = 19.645 ac, 14.78% Impervious, Inflow Depth = 0.68" for 10-Yr Storm event
Inflow = 7.83 cfs @ 12.32 hrs, Volume= 1.107 af
Outflow = 7.83 cfs @ 12.32 hrs, Volume= 1.107 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 = 1.36" for 10-Yr Storm event
Inflow = 1.64 cfs @ 12.15 hrs, Volume= 0.113 af
Outflow = 0.13 cfs @ 14.17 hrs, Volume= 0.113 af, Atten= 92%, Lag= 121.0 min
Primary = 0.13 cfs @ 14.17 hrs, Volume= 0.113 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 271.13' @ 14.17 hrs Surf.Area= 2,063 sf Storage= 2,356 cf

Plug-Flow detention time= 223.6 min calculated for 0.113 af (100% of inflow)
Center-of-Mass det. time= 223.3 min (1,075.2 - 851.9)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 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)
269.50	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 @ 14.17 hrs HW=271.13' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.13 cfs @ 5.99 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' / 264.84' S= 0.0200 '/' 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 = 1.02 cfs @ 12.17 hrs, Volume= 0.093 af, Atten= 20%, Lag= 4.4 min
Discarded = 0.24 cfs @ 12.17 hrs, Volume= 0.075 af
Primary = 0.78 cfs @ 12.17 hrs, Volume= 0.017 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 272.36' @ 12.17 hrs Surf.Area= 1,256 sf Storage= 586 cf

Plug-Flow detention time= 10.4 min calculated for 0.092 af (100% of inflow)
Center-of-Mass det. time= 10.4 min (832.2 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	271.80'	2,643 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)
271.80	877	136.2	0	0	877
272.00	960	140.0	184	184	965
273.50	2,431	218.3	2,459	2,643	3,214

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	272.20'	**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 @ 12.17 hrs HW=272.36' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.24 cfs)

Primary OutFlow Max=0.74 cfs @ 12.17 hrs HW=272.36' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 0.74 cfs @ 0.93 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)

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 = 1.17 cfs @ 12.46 hrs, Volume= 0.237 af, Atten= 58%, Lag= 20.0 min
Discarded = 0.34 cfs @ 12.46 hrs, Volume= 0.179 af
Primary = 0.83 cfs @ 12.46 hrs, Volume= 0.059 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 266.57' @ 12.46 hrs Surf.Area= 1,793 sf Storage= 2,570 cf

Plug-Flow detention time= 47.2 min calculated for 0.237 af (100% of inflow)
Center-of-Mass det. time= 47.1 min (914.1 - 866.9)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,280 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	734	163.0	0	0	734
266.00	1,495	202.0	1,638	1,638	1,899
268.00	2,665	238.0	4,104	5,742	3,234
268.20	2,712	243.0	538	6,280	3,432

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 @ 12.46 hrs HW=266.57' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.34 cfs)

Primary OutFlow Max=0.82 cfs @ 12.46 hrs HW=266.57' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.71 cfs @ 3.62 fps)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.84 fps)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.218 ac, 43.59% Impervious, Inflow Depth = 0.02" for 10-Yr Storm event
Inflow = 0.02 cfs @ 14.90 hrs, Volume= 0.002 af
Outflow = 0.02 cfs @ 14.95 hrs, Volume= 0.002 af, Atten= 1%, Lag= 2.9 min
Primary = 0.02 cfs @ 14.95 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 270.35' @ 14.95 hrs Surf.Area= 64 sf Storage= 7 cf

Plug-Flow detention time= 6.8 min calculated for 0.002 af (98% of inflow)
Center-of-Mass det. time= 5.4 min (910.1 - 904.7)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,378 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	36	36.0	0	0	36
271.00	275	265.0	109	109	5,523
272.00	1,068	285.0	628	738	6,440
274.00	2,696	313.0	3,641	4,378	7,901

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=0.02 cfs @ 14.95 hrs HW=270.35' (Free Discharge)
├─**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 1.08 fps)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.218 ac, 43.59% Impervious, Inflow Depth = 1.46" for 10-Yr Storm event
Inflow = 1.84 cfs @ 12.12 hrs, Volume= 0.148 af
Outflow = 0.13 cfs @ 14.90 hrs, Volume= 0.148 af, Atten= 93%, Lag= 167.1 min
Discarded = 0.11 cfs @ 11.70 hrs, Volume= 0.146 af
Primary = 0.02 cfs @ 14.90 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 273.84' @ 14.90 hrs Surf.Area= 0.045 ac Storage= 0.071 af

Plug-Flow detention time= 305.2 min calculated for 0.148 af (100% of inflow)
Center-of-Mass det. time= 305.1 min (1,171.1 - 866.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.039 af	**11.33'W x 172.00'L x 3.21'H Field A** 0.144 af Overall - 0.047 af Embedded = 0.096 af x 40.0% Voids
#2A	271.90'	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
		0.086 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	273.80'	**6.0" Round Culvert X 4.00** L= 7.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.80' / 273.70' S= 0.0143 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.20 sf

Discarded OutFlow Max=0.11 cfs @ 11.70 hrs HW=271.43' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.02 cfs @ 14.90 hrs HW=273.84' (Free Discharge)
└**2=Culvert** (Inlet Controls 0.02 cfs @ 0.71 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 =	1.65 cfs @	12.15 hrs, Volume=	0.135 af, Atten= 4%, Lag= 1.7 min	
Discarded =	0.01 cfs @	10.90 hrs, Volume=	0.022 af	
Primary =	1.64 cfs @	12.15 hrs, Volume=	0.113 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 272.00' @ 12.15 hrs Surf.Area= 0.013 ac Storage= 0.015 af

Plug-Flow detention time= 66.4 min calculated for 0.135 af (98% of inflow)
Center-of-Mass det. time= 54.2 min (912.3 - 858.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.00'	0.011 af	**16.50'W x 35.50'L x 2.54'H Field A** 0.034 af Overall - 0.008 af Embedded = 0.027 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
		0.018 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	271.22'	**12.0" Round Culvert** L= 54.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 270.95' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 10.90 hrs HW=270.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.64 cfs @ 12.15 hrs HW=272.00' (Free Discharge)
└─**2=Culvert** (Barrel Controls 1.64 cfs @ 3.42 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)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-27: All RD Runoff Area=17,780 sf 27.54% Impervious Runoff Depth=3.43"
Flow Length=115' Tc=6.1 min CN=81 Runoff=1.60 cfs 0.117 af

SubcatchmentPDA18: Rear RD Runoff Area=43,236 sf 49.57% Impervious Runoff Depth=2.24"
Flow Length=322' Tc=7.8 min CN=68 Runoff=2.38 cfs 0.186 af

SubcatchmentPDA21: All RD Runoff Area=53,075 sf 43.59% Impervious Runoff Depth=1.99"
Flow Length=260' Tc=7.3 min CN=65 Runoff=2.60 cfs 0.203 af

SubcatchmentPDA22: All RD Runoff Area=85,190 sf 42.31% Impervious Runoff Depth=1.99"
Flow Length=536' Tc=8.3 min CN=65 Runoff=3.98 cfs 0.325 af

SubcatchmentPDA23: Rear RD Runoff Area=63,488 sf 53.09% Impervious Runoff Depth=2.41"
Tc=6.0 min CN=70 Runoff=4.01 cfs 0.293 af

SubcatchmentPDA23A: Runoff Area=28,700 sf 0.00% Impervious Runoff Depth=0.12"
Flow Length=120' Tc=7.7 min CN=34 Runoff=0.01 cfs 0.007 af

SubcatchmentPDA24: Runoff Area=25,508 sf 10.68% Impervious Runoff Depth=0.56"
Tc=6.0 min CN=44 Runoff=0.16 cfs 0.027 af

SubcatchmentPDA26: Uncontrolled (all Runoff Area=345,710 sf 1.30% Impervious Runoff Depth=0.61"
Flow Length=500' Tc=10.9 min CN=45 Runoff=2.43 cfs 0.404 af

SubcatchmentPDA26A: Uncontrolled from Runoff Area=91,805 sf 0.00% Impervious Runoff Depth=2.59"
Flow Length=275' Tc=27.5 min CN=72 Runoff=3.73 cfs 0.455 af

SubcatchmentPDA26B: Upland Near Fern Runoff Area=93,440 sf 0.00% Impervious Runoff Depth=2.50"
Flow Length=170' Tc=16.3 min CN=71 Runoff=4.53 cfs 0.447 af

SubcatchmentPDA27A: To RG-6 Runoff Area=7,800 sf 0.00% Impervious Runoff Depth=2.77"
Flow Length=140' Tc=4.5 min CN=74 Runoff=0.60 cfs 0.041 af

Reach DP4: East Swamp Inflow=12.84 cfs 1.652 af
Outflow=12.84 cfs 1.652 af

Pond B10: Det. Basin #10 Peak Elev=271.70' Storage=3,650 cf Inflow=2.26 cfs 0.160 af
Outflow=0.15 cfs 0.159 af

Pond B15: Basin #15 Peak Elev=264.41' Storage=254 cf Inflow=0.16 cfs 0.027 af
Discarded=0.04 cfs 0.027 af Primary=0.00 cfs 0.000 af Outflow=0.04 cfs 0.027 af

Pond B16: Basin #16 Peak Elev=272.41' Storage=647 cf Inflow=1.60 cfs 0.117 af
Discarded=0.25 cfs 0.088 af Primary=1.15 cfs 0.028 af Outflow=1.39 cfs 0.117 af

Pond B7: Basin #7 Peak Elev=262.57' Storage=6,071 cf Inflow=4.01 cfs 0.293 af
Discarded=0.26 cfs 0.293 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.293 af

Pond B8: Basin #8 Peak Elev=266.81' Storage=3,031 cf Inflow=3.98 cfs 0.325 af
Discarded=0.37 cfs 0.210 af Primary=2.00 cfs 0.115 af Outflow=2.37 cfs 0.325 af

Pond B8A: Det. Basin #8A Peak Elev=271.20' Storage=176 cf Inflow=0.58 cfs 0.044 af
Outflow=0.37 cfs 0.044 af

Pond LC3: Leaching Chamber Bed #3 Peak Elev=274.04' Storage=0.076 af Inflow=2.60 cfs 0.203 af
Discarded=0.11 cfs 0.159 af Primary=0.58 cfs 0.044 af Outflow=0.69 cfs 0.203 af

Pond LC4: Leaching Chamber Bed #4 Peak Elev=272.19' Storage=0.016 af Inflow=2.38 cfs 0.186 af
Discarded=0.01 cfs 0.023 af Primary=2.26 cfs 0.160 af Outflow=2.27 cfs 0.182 af

Pond RG4: Rain Garden #4 Peak Elev=265.05' Storage=8 cf Inflow=0.01 cfs 0.007 af
Discarded=0.01 cfs 0.007 af Primary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.007 af

Pond RG6: Rain Garden #6 Peak Elev=271.28' Storage=282 cf Inflow=0.60 cfs 0.041 af
Discarded=0.20 cfs 0.041 af Primary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.041 af

Total Runoff Area = 19.645 ac Runoff Volume = 2.505 af Average Runoff Depth = 1.53"
85.22% Pervious = 16.742 ac 14.78% Impervious = 2.903 ac

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 = 2.60 cfs @ 12.11 hrs, Volume= 0.203 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
*	23,137	98	roads, sidewalks, drives, HSG A
	29,938	39	>75% Grass cover, Good, HSG A
	53,075	65	Weighted Average
	29,938		56.41% Pervious Area
	23,137		43.59% 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

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

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

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

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

Inflow Area = 19.645 ac, 14.78% Impervious, Inflow Depth > 1.01" for 25-yr event
Inflow = 12.84 cfs @ 12.28 hrs, Volume= 1.652 af
Outflow = 12.84 cfs @ 12.28 hrs, Volume= 1.652 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 = 1.93" for 25-yr event
Inflow = 2.26 cfs @ 12.14 hrs, Volume= 0.160 af
Outflow = 0.15 cfs @ 14.58 hrs, Volume= 0.159 af, Atten= 93%, Lag= 146.3 min
Primary = 0.15 cfs @ 14.58 hrs, Volume= 0.159 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 271.70' @ 14.58 hrs Surf.Area= 2,462 sf Storage= 3,650 cf

Plug-Flow detention time= 294.4 min calculated for 0.159 af (100% of inflow)
Center-of-Mass det. time= 293.0 min (1,139.3 - 846.3)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 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)
269.50	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 @ 14.58 hrs HW=271.70' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.15 cfs @ 7.01 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' / 264.84' S= 0.0200 '/' 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 = 1.39 cfs @ 12.15 hrs, Volume= 0.117 af, Atten= 13%, Lag= 3.2 min
Discarded = 0.25 cfs @ 12.15 hrs, Volume= 0.088 af
Primary = 1.15 cfs @ 12.15 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 272.41' @ 12.15 hrs Surf.Area= 1,297 sf Storage= 647 cf

Plug-Flow detention time= 10.1 min calculated for 0.117 af (100% of inflow)
Center-of-Mass det. time= 10.1 min (825.3 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1	271.80'	2,643 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)
271.80	877	136.2	0	0	877
272.00	960	140.0	184	184	965
273.50	2,431	218.3	2,459	2,643	3,214

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	272.20'	**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=0.25 cfs @ 12.15 hrs HW=272.41' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=1.14 cfs @ 12.15 hrs HW=272.41' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.14 cfs @ 1.08 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)

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 = 2.37 cfs @ 12.31 hrs, Volume= 0.325 af, Atten= 40%, Lag= 11.0 min
Discarded = 0.37 cfs @ 12.31 hrs, Volume= 0.210 af
Primary = 2.00 cfs @ 12.31 hrs, Volume= 0.115 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 266.81' @ 12.31 hrs Surf.Area= 1,931 sf Storage= 3,031 cf

Plug-Flow detention time= 43.5 min calculated for 0.325 af (100% of inflow)
Center-of-Mass det. time= 43.4 min (900.7 - 857.2)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,280 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	734	163.0	0	0	734
266.00	1,495	202.0	1,638	1,638	1,899
268.00	2,665	238.0	4,104	5,742	3,234
268.20	2,712	243.0	538	6,280	3,432

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=0.37 cfs @ 12.31 hrs HW=266.81' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.37 cfs)

Primary OutFlow Max=1.99 cfs @ 12.31 hrs HW=266.81' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 0.85 cfs @ 4.34 fps)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 1.13 cfs @ 1.87 fps)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.218 ac, 43.59% Impervious, Inflow Depth = 0.43" for 25-yr event
Inflow = 0.58 cfs @ 12.55 hrs, Volume= 0.044 af
Outflow = 0.37 cfs @ 12.73 hrs, Volume= 0.044 af, Atten= 36%, Lag= 10.6 min
Primary = 0.37 cfs @ 12.73 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 271.20' @ 12.73 hrs Surf.Area= 393 sf Storage= 176 cf

Plug-Flow detention time= 4.7 min calculated for 0.043 af (100% of inflow)
Center-of-Mass det. time= 4.5 min (815.4 - 810.9)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,378 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	36	36.0	0	0	36
271.00	275	265.0	109	109	5,523
272.00	1,068	285.0	628	738	6,440
274.00	2,696	313.0	3,641	4,378	7,901

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=0.37 cfs @ 12.73 hrs HW=271.20' (Free Discharge)
├─**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 0.37 cfs @ 4.26 fps)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.218 ac, 43.59% Impervious, Inflow Depth = 1.99" for 25-yr event
Inflow = 2.60 cfs @ 12.11 hrs, Volume= 0.203 af
Outflow = 0.69 cfs @ 12.55 hrs, Volume= 0.203 af, Atten= 73%, Lag= 26.2 min
Discarded = 0.11 cfs @ 11.55 hrs, Volume= 0.159 af
Primary = 0.58 cfs @ 12.55 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 274.04' @ 12.55 hrs Surf.Area= 0.045 ac Storage= 0.076 af

Plug-Flow detention time= 256.9 min calculated for 0.203 af (100% of inflow)
Center-of-Mass det. time= 256.8 min (1,113.2 - 856.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.039 af	**11.33'W x 172.00'L x 3.21'H Field A** 0.144 af Overall - 0.047 af Embedded = 0.096 af x 40.0% Voids
#2A	271.90'	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
		0.086 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	273.80'	**6.0" Round Culvert X 4.00** L= 7.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.80' / 273.70' S= 0.0143 '/' 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=0.58 cfs @ 12.55 hrs HW=274.04' (Free Discharge)
└**2=Culvert** (Barrel Controls 0.58 cfs @ 2.25 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 =	2.27 cfs @	12.14 hrs, Volume=	0.182 af, Atten= 4%, Lag= 1.5 min	
Discarded =	0.01 cfs @	10.35 hrs, Volume=	0.023 af	
Primary =	2.26 cfs @	12.14 hrs, Volume=	0.160 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 272.19' @ 12.14 hrs Surf.Area= 0.013 ac Storage= 0.016 af

Plug-Flow detention time= 51.6 min calculated for 0.182 af (98% of inflow)
Center-of-Mass det. time= 41.7 min (890.9 - 849.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.00'	0.011 af	**16.50'W x 35.50'L x 2.54'H Field A** 0.034 af Overall - 0.008 af Embedded = 0.027 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
		0.018 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	271.22'	**12.0" Round Culvert** L= 54.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 270.95' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 10.35 hrs HW=270.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=2.23 cfs @ 12.14 hrs HW=272.19' (Free Discharge)
└─**2=Culvert** (Barrel Controls 2.23 cfs @ 3.66 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)

Time span=0.00-30.00 hrs, dt=0.05 hrs, 601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

SubcatchmentPDA-27: All RD Runoff Area=17,780 sf 27.54% Impervious Runoff Depth=4.53"
Flow Length=115' Tc=6.1 min CN=81 Runoff=2.09 cfs 0.154 af

SubcatchmentPDA18: Rear RD Runoff Area=43,236 sf 49.57% Impervious Runoff Depth=3.17"
Flow Length=322' Tc=7.8 min CN=68 Runoff=3.40 cfs 0.262 af

SubcatchmentPDA21: All RD Runoff Area=53,075 sf 43.59% Impervious Runoff Depth=2.87"
Flow Length=260' Tc=7.3 min CN=65 Runoff=3.82 cfs 0.292 af

SubcatchmentPDA22: All RD Runoff Area=85,190 sf 42.31% Impervious Runoff Depth=2.87"
Flow Length=536' Tc=8.3 min CN=65 Runoff=5.91 cfs 0.468 af

SubcatchmentPDA23: Rear RD Runoff Area=63,488 sf 53.09% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=70 Runoff=5.64 cfs 0.409 af

SubcatchmentPDA23A: Runoff Area=28,700 sf 0.00% Impervious Runoff Depth=0.36"
Flow Length=120' Tc=7.7 min CN=34 Runoff=0.07 cfs 0.020 af

SubcatchmentPDA24: Runoff Area=25,508 sf 10.68% Impervious Runoff Depth=1.02"
Tc=6.0 min CN=44 Runoff=0.47 cfs 0.050 af

SubcatchmentPDA26: Uncontrolled (all Runoff Area=345,710 sf 1.30% Impervious Runoff Depth=1.10"
Flow Length=500' Tc=10.9 min CN=45 Runoff=6.08 cfs 0.727 af

SubcatchmentPDA26A: Uncontrolled from Runoff Area=91,805 sf 0.00% Impervious Runoff Depth=3.57"
Flow Length=275' Tc=27.5 min CN=72 Runoff=5.18 cfs 0.628 af

SubcatchmentPDA26B: Upland Near Fern Runoff Area=93,440 sf 0.00% Impervious Runoff Depth=3.47"
Flow Length=170' Tc=16.3 min CN=71 Runoff=6.34 cfs 0.621 af

SubcatchmentPDA27A: To RG-6 Runoff Area=7,800 sf 0.00% Impervious Runoff Depth=3.78"
Flow Length=140' Tc=4.5 min CN=74 Runoff=0.82 cfs 0.056 af

Reach DP4: East Swamp Inflow=22.04 cfs 2.577 af
Outflow=22.04 cfs 2.577 af

Pond B10: Det. Basin #10 Peak Elev=272.52' Storage=5,892 cf Inflow=3.19 cfs 0.235 af
Outflow=0.18 cfs 0.222 af

Pond B15: Basin #15 Peak Elev=264.97' Storage=748 cf Inflow=0.47 cfs 0.050 af
Discarded=0.06 cfs 0.050 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.050 af

Pond B16: Basin #16 Peak Elev=272.47' Storage=719 cf Inflow=2.09 cfs 0.154 af
Discarded=0.26 cfs 0.108 af Primary=1.65 cfs 0.046 af Outflow=1.90 cfs 0.154 af

Pond B7: Basin #7 Peak Elev=263.20' Storage=9,270 cf Inflow=5.64 cfs 0.409 af
Discarded=0.30 cfs 0.407 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.407 af

Pond B8: Basin #8 Peak Elev=267.12' Storage=3,651 cf Inflow=5.91 cfs 0.468 af
Discarded=0.40 cfs 0.251 af Primary=4.16 cfs 0.217 af Outflow=4.57 cfs 0.468 af

Pond B8A: Det. Basin #8A Peak Elev=272.59' Storage=1,488 cf Inflow=2.01 cfs 0.116 af
Outflow=0.62 cfs 0.116 af

Pond LC3: Leaching Chamber Bed #3 Peak Elev=274.35' Storage=0.081 af Inflow=3.82 cfs 0.292 af
Discarded=0.11 cfs 0.175 af Primary=2.01 cfs 0.116 af Outflow=2.12 cfs 0.292 af

Pond LC4: Leaching Chamber Bed #4 Peak Elev=272.64' Storage=0.018 af Inflow=3.40 cfs 0.262 af
Discarded=0.01 cfs 0.024 af Primary=3.19 cfs 0.235 af Outflow=3.20 cfs 0.259 af

Pond RG4: Rain Garden #4 Peak Elev=265.71' Storage=197 cf Inflow=0.07 cfs 0.020 af
Discarded=0.02 cfs 0.020 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.020 af

Pond RG6: Rain Garden #6 Peak Elev=271.50' Storage=514 cf Inflow=0.82 cfs 0.056 af
Discarded=0.22 cfs 0.056 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.056 af

Total Runoff Area = 19.645 ac Runoff Volume = 3.687 af Average Runoff Depth = 2.25"
85.22% Pervious = 16.742 ac 14.78% Impervious = 2.903 ac

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 = 3.82 cfs @ 12.11 hrs, Volume= 0.292 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
*	23,137	98	roads, sidewalks, drives, HSG A
	29,938	39	>75% Grass cover, Good, HSG A
	53,075	65	Weighted Average
	29,938		56.41% Pervious Area
	23,137		43.59% 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

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

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

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

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

Inflow Area = 19.645 ac, 14.78% Impervious, Inflow Depth > 1.57" for 100-Yr Storm event
Inflow = 22.04 cfs @ 12.23 hrs, Volume= 2.577 af
Outflow = 22.04 cfs @ 12.23 hrs, Volume= 2.577 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 = 2.84" for 100-Yr Storm event
Inflow = 3.19 cfs @ 12.15 hrs, Volume= 0.235 af
Outflow = 0.18 cfs @ 15.11 hrs, Volume= 0.222 af, Atten= 94%, Lag= 177.7 min
Primary = 0.18 cfs @ 15.11 hrs, Volume= 0.222 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 272.52' @ 15.11 hrs Surf.Area= 3,021 sf Storage= 5,892 cf

Plug-Flow detention time= 388.9 min calculated for 0.222 af (94% of inflow)
Center-of-Mass det. time= 360.6 min (1,199.9 - 839.3)

Volume	Invert	Avail.Storage	Storage Description
#1	269.50'	11,150 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)
269.50	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 @ 15.11 hrs HW=272.52' (Free Discharge)
└─**1=Orifice/Grate** (Orifice Controls 0.18 cfs @ 8.25 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' / 264.84' S= 0.0200 '/' 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 = 1.90 cfs @ 12.13 hrs, Volume= 0.154 af, Atten= 9%, Lag= 2.3 min
Discarded = 0.26 cfs @ 12.13 hrs, Volume= 0.108 af
Primary = 1.65 cfs @ 12.13 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 272.47' @ 12.13 hrs Surf.Area= 1,346 sf Storage= 719 cf

Plug-Flow detention time= 9.9 min calculated for 0.154 af (100% of inflow)
Center-of-Mass det. time= 9.9 min (817.2 - 807.3)

Volume	Invert	Avail.Storage	Storage Description
#1	271.80'	2,643 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)
271.80	877	136.2	0	0	877
272.00	960	140.0	184	184	965
273.50	2,431	218.3	2,459	2,643	3,214

Device	Routing	Invert	Outlet Devices
#1	Discarded	271.80'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	272.20'	**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 @ 12.13 hrs HW=272.46' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.26 cfs)

Primary OutFlow Max=1.60 cfs @ 12.13 hrs HW=272.46' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 1.60 cfs @ 1.22 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)

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 = 4.57 cfs @ 12.22 hrs, Volume= 0.468 af, Atten= 23%, Lag= 5.7 min
Discarded = 0.40 cfs @ 12.22 hrs, Volume= 0.251 af
Primary = 4.16 cfs @ 12.22 hrs, Volume= 0.217 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= 2,110 sf Storage= 3,651 cf

Plug-Flow detention time= 39.2 min calculated for 0.467 af (100% of inflow)
Center-of-Mass det. time= 39.2 min (885.5 - 846.4)

Volume	Invert	Avail.Storage	Storage Description
#1	264.50'	6,280 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	734	163.0	0	0	734
266.00	1,495	202.0	1,638	1,638	1,899
268.00	2,665	238.0	4,104	5,742	3,234
268.20	2,712	243.0	538	6,280	3,432

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=0.40 cfs @ 12.22 hrs HW=267.11' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.40 cfs)

Primary OutFlow Max=4.07 cfs @ 12.22 hrs HW=267.11' (Free Discharge)
├─**2=Orifice/Grate** (Orifice Controls 1.00 cfs @ 5.07 fps)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.07 cfs @ 2.68 fps)

Summary for Pond B8A: Det. Basin #8A

Inflow Area = 1.218 ac, 43.59% Impervious, Inflow Depth = 1.14" for 100-Yr Storm event
Inflow = 2.01 cfs @ 12.28 hrs, Volume= 0.116 af
Outflow = 0.62 cfs @ 12.68 hrs, Volume= 0.116 af, Atten= 69%, Lag= 23.5 min
Primary = 0.62 cfs @ 12.68 hrs, Volume= 0.116 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 272.59' @ 12.68 hrs Surf.Area= 1,473 sf Storage= 1,488 cf

Plug-Flow detention time= 22.5 min calculated for 0.116 af (100% of inflow)
Center-of-Mass det. time= 22.4 min (817.4 - 795.0)

Volume	Invert	Avail.Storage	Storage Description
#1	270.20'	4,378 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	36	36.0	0	0	36
271.00	275	265.0	109	109	5,523
272.00	1,068	285.0	628	738	6,440
274.00	2,696	313.0	3,641	4,378	7,901

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=0.62 cfs @ 12.68 hrs HW=272.59' (Free Discharge)
├─**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Orifice Controls 0.62 cfs @ 7.10 fps)

Summary for Pond LC3: Leaching Chamber Bed #3

Inflow Area = 1.218 ac, 43.59% Impervious, Inflow Depth = 2.87" for 100-Yr Storm event
Inflow = 3.82 cfs @ 12.11 hrs, Volume= 0.292 af
Outflow = 2.12 cfs @ 12.28 hrs, Volume= 0.292 af, Atten= 45%, Lag= 10.4 min
Discarded = 0.11 cfs @ 11.15 hrs, Volume= 0.175 af
Primary = 2.01 cfs @ 12.28 hrs, Volume= 0.116 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2

Peak Elev= 274.35' @ 12.28 hrs Surf.Area= 0.045 ac Storage= 0.081 af

Plug-Flow detention time= 202.1 min calculated for 0.291 af (100% of inflow)
Center-of-Mass det. time= 202.4 min (1,047.8 - 845.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	271.40'	0.039 af	**11.33'W x 172.00'L x 3.21'H Field A** 0.144 af Overall - 0.047 af Embedded = 0.096 af x 40.0% Voids
#2A	271.90'	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
		0.086 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	273.80'	**6.0" Round Culvert X 4.00** L= 7.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 273.80' / 273.70' S= 0.0143 '/' 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=1.99 cfs @ 12.28 hrs HW=274.34' (Free Discharge)
└**2=Culvert** (Barrel Controls 1.99 cfs @ 2.90 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 =	3.20 cfs @	12.15 hrs, Volume=	0.259 af, Atten= 6%, Lag= 1.8 min	
Discarded =	0.01 cfs @	9.60 hrs, Volume=	0.024 af	
Primary =	3.19 cfs @	12.15 hrs, Volume=	0.235 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 272.64' @ 12.15 hrs Surf.Area= 0.013 ac Storage= 0.018 af

Plug-Flow detention time= 38.8 min calculated for 0.259 af (99% of inflow)
Center-of-Mass det. time= 31.4 min (870.5 - 839.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	270.00'	0.011 af	**16.50'W x 35.50'L x 2.54'H Field A** 0.034 af Overall - 0.008 af Embedded = 0.027 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
		0.018 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	270.00'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	271.22'	**12.0" Round Culvert** L= 54.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 271.22' / 270.95' S= 0.0050 '/' Cc= 0.900 n= 0.011 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.01 cfs @ 9.60 hrs HW=270.03' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=3.15 cfs @ 12.15 hrs HW=272.63' (Free Discharge)
└─**2=Culvert** (Barrel Controls 3.15 cfs @ 4.02 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

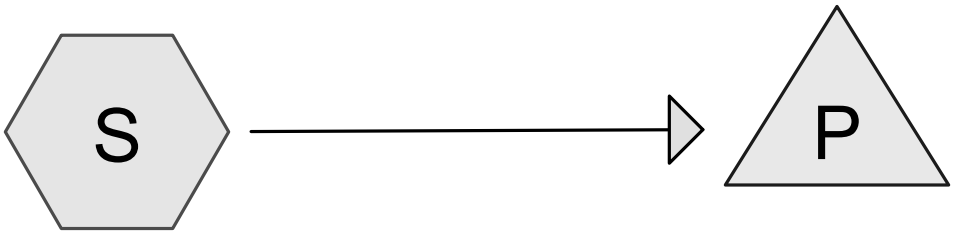
Device	Routing	Invert	Outlet Devices
#1	Discarded	271.00'	**8.270 in/hr Exfiltration over Surface area**
#2	Primary	271.50'	**3.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

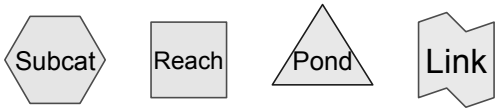
Discarded OutFlow Max=0.22 cfs @ 12.44 hrs HW=271.50' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.22 cfs)

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)





Routing Diagram for Recharge
Prepared by Microsoft, Printed 3/28/2018

Summary for Subcatchment S: Impervious Area

Runoff = 10.36 cfs @ 12.09 hrs, Volume= 0.445 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 (sf)	CN	Description
*	429,784	98	Impervious
	429,784		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

Inflow Area = 9.866 ac,100.00% Impervious, Inflow Depth > 0.54" for Recharge event
Inflow = 10.36 cfs @ 12.09 hrs, Volume= 0.445 af
Outflow = 0.39 cfs @ 11.15 hrs, Volume= 0.067 af, Atten= 96%, Lag= 0.0 min
Discarded = 0.39 cfs @ 11.15 hrs, Volume= 0.067 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= 16,650 sf Storage= 16,420 cf

Plug-Flow detention time= 34.8 min calculated for 0.066 af (15% of inflow)
Center-of-Mass det. time= (not calculated: outflow precedes inflow)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	16,650 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	16,650	0	0
101.00	16,650	16,650	16,650

Device	Routing	Invert	Outlet Devices
#1	Discarded	100.00'	**1.020 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.39 cfs @ 11.15 hrs HW=100.01' (Free Discharge)
└─**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

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JOB NAME: Timber Crest Estates **CHECK BY:** JAP **DATE:** 3/15/18
TOWN: Medway

STANDARD 3: GROUNDWATER RECHARGE CALCULATIONS

Required Recharge Volume
Rv = F x impervious area (including green roofs & porous pavement)
where F = Target Depth Factor

Total Impervious Area*= 431,704 S.F. = 9.91 ACRES

***Total Impervious area does not include roof areas going to roof drains (front roof areas of Lots 80-84, 104-107, 112-119, 126-128, and 141-145 do not have roof drains and are included in the total impervious area shown).**

	HSG A	HSG B	HSG C	HSG D
Impervious Area (sf)	340,182	0	91,522	0
Target Depth Factor (in.)	0.6	0.35	0.25	0.1
Annual Recharge Volume (cf)	17009	0	1907	0

Total required volume to recharge = 18,916 c.f.

CAPTURE AREA ADJUSTMENT:

Total Site Impervious Area	=	9.91	ACRES				
Total Impervious Area Directed to Infiltration BMPs	=	9.65	ACRES				
Adjustment Ratio	=	9.91	/	9.65	=	1.03	
Adjusted Required Recharge Volume	=	**18,916**	x	1.03	=	**19,433**	**c.f.**
	=	**19,433**	/	43,560	=	**0.446**	**a.f.**

SIMPLE DYNAMIC METHOD:
Recharge Provided through exfiltration in Infiltration Basins 1-9, 12, 14-16, and Leaching Chambers 3 and 4.
1.19" 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 = **16,650 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 = 1,365 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 14 (below lowest outlet at 273.60):
Cumulative Vol. at 273.60 = 2,155 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.

Volume provided in Leaching Chamber Bed 3 (below lowest outlet at 273.80):
Cumulative Vol. at 273.80 = 2,344 c.f.

Volume provided in Leaching Chamber Bed 4 (below lowest outlet at 271.22):
Cumulative Vol. at 271.22 = 299 c.f.

STORAGE VOLUME PROVIDED

Infiltration BMP	TOTAL VOLUME (C.F.)	BOTTOM AREA (S.F.)
Basin 1	3,022	3,448
Basin 2	4,453	1,260
Basin 3	12,500	6,760
Basin 4	7,914	4,280
Basin 5	9,101	4,974
Basin 6	963	2,694
Basin 7	6,839	3,170
Basin 8	1,365	734
Basin 9	3,409	2,170
Basin 12	7,304	2,158
Basin 14	2,155	830
Basin 15	2,171	530
Basin 16	1,122	555
LC 3	2,344	1,949
LC 4	299	586
TOTAL	**64,961**	36,098

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											
DRAWDOWN TIME	=	3,022	X	1 / 2.41	X	12 / 1	X	1 / 3,448	=	**4.36**	Hours
INFILTRATION BASIN 2											
DRAWDOWN TIME	=	4,453	X	1 / 8.27	X	12 / 1	X	1 / 1,260	=	**5.13**	Hours
INFILTRATION BASIN 3											
DRAWDOWN TIME	=	12,500	X	1 / 2.41	X	12 / 1	X	1 / 6,760	=	**9.21**	Hours
INFILTRATION BASIN 4											
DRAWDOWN TIME	=	7,914	X	1 / 2.41	X	12 / 1	X	1 / 4,280	=	**9.21**	Hours
INFILTRATION BASIN 5											
DRAWDOWN TIME	=	9,101	X	1 / 2.41	X	12 / 1	X	1 / 4,974	=	**9.11**	Hours
INFILTRATION BASIN 6											
DRAWDOWN TIME	=	963	X	1 / 2.41	X	12 / 1	X	1 / 2,694	=	**1.78**	Hours
INFILTRATION BASIN 7											
DRAWDOWN TIME	=	6,839	X	1 / 2.41	X	12 / 1	X	1 / 3,170	=	**10.74**	Hours
INFILTRATION BASIN 8											
DRAWDOWN TIME	=	1,365	X	1 / 8.27	X	12 / 1	X	1 / 734	=	**2.70**	Hours
INFILTRATION BASIN 9											
DRAWDOWN TIME	=	3,409	X	1 / 1.02	X	12 / 1	X	1 / 2,170	=	**18.48**	Hours
INFILTRATION BASIN 12											
DRAWDOWN TIME	=	7,304	X	1 / 8.27	X	12 / 1	X	1 / 2,158	=	**4.91**	Hours
INFILTRATION BASIN 14											
DRAWDOWN TIME	=	2,155	X	1 / 2.41	X	12 / 1	X	1 / 830	=	**12.93**	Hours
INFILTRATION BASIN 15											
DRAWDOWN TIME	=	2,171	X	1 / 2.41	X	12 / 1	X	1 / 530	=	**20.40**	Hours
INFILTRATION BASIN 16											
DRAWDOWN TIME	=	1,122	X	1 / 2.41	X	12 / 1	X	1 / 555	=	**10.07**	Hours
LEACHING CHAMBER BED 3											
DRAWDOWN TIME	=	2,344	X	1 / 2.41	X	12 / 1	X	1 / 1,949	=	**5.99**	Hours
LEACHING CHAMBER BED 4											
DRAWDOWN TIME	=	299	X	1 / 1.02	X	12 / 1	X	1 / 586	=	**6.00**	Hours
RAIN GARDEN 1											
DRAWDOWN TIME	=	1,016	X	1 / 2.41	X	12 / 1	X	1 / 1,998	=	**2.53**	Hours
RAIN GARDEN 2											
DRAWDOWN TIME	=	970	X	1 / 2.41	X	12 / 1	X	1 / 779	=	**6.20**	Hours
RAIN GARDEN 3											
DRAWDOWN TIME	=	496	X	1 / 2.41	X	12 / 1	X	1 / 345	=	**7.16**	Hours
RAIN GARDEN 4											
DRAWDOWN TIME	=	251	X	1 / 2.41	X	12 / 1	X	1 / 164	=	**7.62**	Hours
RAIN GARDEN 6											
DRAWDOWN TIME	=	536	X	1 / 8.27	X	12 / 1	X	1 / 937	=	**0.83**	Hours

Appendix F-1

Water Quality Volume Calculations (Standard #4)

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STANDARD 4: WATER QUALITY

WATER QUALITY VOLUME:
V(WQ) = D(WQ) X (12 IN. / FT) X A(IMP)
WHERE,
V(WQ) = REQUIRED WATER QUALITY TREATMENT VOLUME IN CUBIC FEET
D(WQ) = WATER QUALITY DEPTH (0.5 INCH OR 1 INCH)
A(IMP) = IMPERVIOUS AREA IN S.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 1
CONTRIBUITING IMPERVIOUS AREA = 37,462 S.F.

V(WQ)	=	0.5	IN.	X	1 FT/ 12 IN.	X	37,462	S.F.	=	1,561	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 SEDIMENT FOREBAY											
(See Sediment Forebay Calculations)									=	365	C.F.
VOLUME PROVIDED AT BASIN 1 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	3,022	C.F.
								TOTAL	=	3,638	C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 2
CONTRIBUITING IMPERVIOUS AREA = 33,130 S.F.

V(WQ)	=	1	IN.	X	1 FT/ 12 IN.	X	33,130	S.F.	=	2,761	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)									=	614	C.F.
VOLUME PROVIDED AT BASIN 2 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	4,453	C.F.
								TOTAL	=	5,218	C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 3
CONTRIBUITING IMPERVIOUS AREA = 45,227 S.F.

V(WQ)	=	1	IN.	X	1 FT/ 12 IN.	X	45,227	S.F.	=	3,769	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)									=	1,123	C.F.
VOLUME PROVIDED AT BASIN 3 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	12,500	C.F.
								TOTAL	=	13,824	C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 4
CONTRIBUITING IMPERVIOUS AREA = 29,960 S.F.

V(WQ)	=	0.5	IN.	X	1 FT/ 12 IN.	X	29,960	S.F.	=	1,248	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)									=	307	C.F.
VOLUME PROVIDED AT BASIN 4 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	7,914	C.F.
								TOTAL	=	8,322	C.F.

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WATER QUALITY VOLUME AT INFILTRATION BASIN 5

CONTRIBUITING 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) = 266 C.F.
VOLUME PROVIDED AT BASIN 5 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calcualtions) = 9,101 C.F.

TOTAL = 9,518 C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 6

CONTRIBUITING 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 SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 928 C.F.
VOLUME PROVIDED AT BASIN 6 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calcualtions) = 963 C.F.

TOTAL = 1,992 C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 7

CONTRIBUITING IMPERVIOUS AREA = 33,707 S.F.

V(WQ)	=	0.5	IN.	X	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) = 297 C.F.
VOLUME PROVIDED AT BASIN 7 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calcualtions) = 6,839 C.F.

TOTAL = 7,237 C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 8

CONTRIBUITING IMPERVIOUS AREA = 36,048 S.F.

V(WQ)	=	1	IN.	X	IN.	X	36,048	S.F.	=	3,004 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 SEDIMENT FOREBAY
(See Sediment Forebay Calculations) = 1,482 C.F.
VOLUME PROVIDED AT BASIN 8 (BELOW LOWEST OUTLET)
(See Groundwater Recharge Calcualtions) = 1,365 C.F.

TOTAL = 3,098 C.F.

WATER QUALITY VOLUME AT DRY DETENTION BASIN 8A (LC-3)

CONTRIBUITING IMPERVIOUS AREA = 23,137 S.F.

V(WQ)	=	1	IN.	X	IN.	X	23,137	S.F.	=	1,928 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 WATER QUALITY TANK (3000 GALLON) =401 ft^3
= 401 C.F.

VOLUME PROVIDED FROM LEACHING CHAMBERS
(below lowest oulet) = 2,052 C.F.

TOTAL = 2,654 C.F.

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WATER QUALITY VOLUME AT INFILTRATION BASIN 9

CONTRIBUITING IMPERVIOUS AREA = 21,271 S.F.

V(WQ)	=	0.5	IN.	X	1 FT/ 12 IN.	X	21,271	S.F.	=	886	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)									=	235	C.F.
VOLUME PROVIDED AT BASIN 9 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	3,409	C.F.
								TOTAL	=	3,795	C.F.

WATER QUALITY VOLUME AT DRY DETENTION BASIN 10 (LC-4)

CONTRIBUITING 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 ft^3											
									=	468	C.F.
VOLUME PROVIDED FROM LEACHING CHAMBERS											
(below lowest outlet)									=	167	C.F.
								TOTAL	=	959	C.F.

WATER QUALITY VOLUME AT WATER QUALITY SWALE #2

CONTRIBUITING 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)									=	302	C.F.
VOLUME PROVIDED FROM WATER QUALITY SWALE *(See Post-Development HydroCAD Calc)*											
									=	1,823	C.F.
								TOTAL	=	2,226	C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 12

CONTRIBUITING IMPERVIOUS AREA = 21,657 S.F.

V(WQ)	=	1	IN.	X	1 FT/ 12 IN.	X	21,657	S.F.	=	1,805	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)									=	341	C.F.
VOLUME PROVIDED AT BASIN 12 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	7,304	C.F.
								TOTAL	=	7,695	C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 14

CONTRIBUITING IMPERVIOUS AREA = 13,384 S.F.

V(WQ)	=	0.5	IN.	X	1 FT/ 12 IN.	X	13,384	S.F.	=	558	C.F.
VOLUME PROVIDED FROM SEDIMENT FOREBAY											
(See Sediment Forebay Calculations)									=	386	C.F.
VOLUME PROVIDED AT BASIN 14 (BELOW LOWEST OUTLET)											
(See Groundwater Recharge Calcualtions)									=	2,155	C.F.
								TOTAL	=	2,541	C.F.

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TOWN: Medway

WATER QUALITY VOLUME AT INFILTRATION BASIN 15

CONTRIBUITING 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 BASIN 15 (BELOW LOWEST OUTLET)				
(See Groundwater Recharge Calcualtions)			=	266 C.F.
		TOTAL	=	583 C.F.

WATER QUALITY VOLUME AT INFILTRATION BASIN 16

CONTRIBUITING IMPERVIOUS AREA = 4,896 S.F.

V(WQ)	=	1	IN.	X	1 FT/ 12 IN.	X	4,896	S.F.	=	408 C.F.

VOLUME PROVIDED FROM SEDIMENT FOREBAY				
(See Sediment Forebay Calculations)			=	548 C.F.
VOLUME PROVIDED AT BASIN 16 (BELOW LOWEST OUTLET)				
(See Groundwater Recharge Calcualtions)			=	1,122 C.F.
		TOTAL	=	1,670 C.F.

WATER QUALITY VOLUME AT WATER QUALITY SWALE #1

CONTRIBUITING IMPERVIOUS AREA = 6,400 S.F.

V(WQ)	=	0.5	IN.	X	1 FT/ 12 IN.	X	6,400	S.F.	=	267 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)			=	238 C.F.
VOLUME PROVIDED FROM WATER QUALITY SWALE *(See Post-Development HydroCAD Calc)*				
			=	994 C.F.
		TOTAL	=	1,333 C.F.

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TSS REMOVAL CALCULATIONS FOR INFILTRATION BASINS WITH RAPID INFILTRATION

PRETREATMENT OF INFILTRATION BASIN 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
		Total TSS Removal=	0.44	

PRETREATMENT OF INFILTRATION BASIN 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
		Total TSS Removal=	0.44	

PRETREATMENT OF INFILTRATION BASIN 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 LEACHING CHAMBER BED 3 / DRY DETENTION BASIN 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
Water Quality Tank	25%	0.75	0.19	0.56
		Total TSS Removal=	0.44	

PRETREATMENT OF INFILTRATION BASIN 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 INFILTRATION BASIN 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	

Appendix F-2

TSS Removal Calculations (Standard #4)

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TSS REMOVALS FOR EACH DISCHARGE

TREATMENT OF INFILTRATION BASIN 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 INFILTRATION BASIN 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 INFILTRATION BASIN 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 INFILTRATION BASIN 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 INFILTRATION BASIN 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	

TREATMENT OF INFILTRATION BASIN 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	

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TREATMENT OF INFILTRATION BASIN 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 INFILTRATION BASIN 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 LEACHING CHAMBER BED 3 / DRY DETENTION BASIN 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
Dry Detention Basin	0%	0.15	0	0.15
		Total TSS Removal=	0.85	

TREATMENT OF INFILTRATION BASIN 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 LEACHING CHAMBER BED 4 / DRY DETENTION BASIN 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-Treament WQ tank)	80%	0.75	0.60	0.15
Dry Detention Basin	0%	0.15	0.00	0.15
		Total TSS Removal=	0.85	

TREATMENT OF WATER QUALITY SWALE #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
Sed Forebay	25%	0.75	0.19	0.56
Water Quality Swale w/ forebay	70%	0.56	0.39	0.17
		Total TSS Removal=	0.83	

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TREATMENT OF WATER QUALITY SWALE #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
Sed Forebay	25%	0.75	0.19	0.56
Water Quality Swale w/ forebay	70%	0.56	0.39	0.17
		Total TSS Removal=	0.83	

TREATMENT OF INFILTRATION BASIN 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 INFILTRATION BASIN 14

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (BXC)	E Remaining Load (C-D)
Infiltration Basin (with Sediment Forebay)	80%	1	0.8	0.2
		Total TSS Removal=	0.80	

TREATMENT OF INFILTRATION BASIN 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 INFILTRATION BASIN 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 F-3

Sediment Forebay Calculations (Standard #4)

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TOWN: Medway

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. =	266.20	AREA =	93 S.F.
FOREBAY BERM EL. =	267.70	AREA =	393 S.F.

VOLUME PROVIDED = 365 C.F.

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JOB NAME: Timber Crest Estates **CHECK BY:** J.A.P. **DATE:** 02/28/18
TOWN: Medway

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. =	274.00	AREA =	234 S.F.
FOREBAY BERM EL. =	275.50	AREA =	585 S.F.

VOLUME PROVIDED = 614 C.F.

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TOWN: medway MA

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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

REQ'D SED. FOREBAY VOLUME = .1" INCHES X $\frac{1\text{ FT}}{12\text{ IN}}$ X 45,227 S.F.

= 377 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

Forebay @ West side of basin	BOTTOM FOREBAY EL. =	277.50	AREA =	70 S.F.
	FOREBAY BERM EL. =	279.00	AREA =	332 S.F.
			VOLUME PROVIDED =	302 C.F.
Forebay @ East side of basin	BOTTOM FOREBAY EL. =	277.50	AREA =	305 S.F.
	FOREBAY BERM EL. =	279.00	AREA =	790 S.F.
			VOLUME PROVIDED =	821 C.F.

1,123 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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TOWN: Medway

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. =	271.30	AREA =	134 S.F.
FOREBAY BERM EL. =	272.50	AREA =	310 S.F.

VOLUME PROVIDED = 266 C.F.

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TOWN: Medway

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. =	268.70	AREA =	504 S.F.
FOREBAY BERM EL. =	270.00	AREA =	923 S.F.

VOLUME PROVIDED = 928 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. =	261.00	AREA =	201 S.F.
FOREBAY BERM EL. =	262.00	AREA =	392 S.F.

VOLUME PROVIDED = 297 C.F.

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TOWN: Medway

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 = 0.1" 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. =	264.00	AREA =	109 S.F.
FOREBAY BERM EL. =	267.00	AREA =	879 S.F.

VOLUME PROVIDED = 1,482 C.F.

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TOWN: medway MA

CALC BY: K.A.D. **DATE:** 03/01/18
CHECK BY: J.A.P. **DATE:** 03/01/18

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #9

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 21,271 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 21,271 S.F.

= 177 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. =	272.70	AREA =	60	S.F.
FOREBAY BERM EL. =	274.00	AREA =	302	S.F.

VOLUME PROVIDED = 235 C.F.

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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 =	350 S.F.

VOLUME PROVIDED = 341 C.F.

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TOWN: Medway

SEDIMENT FOREBAY SIZING CALCULATION FOR INFIL. BASIN #14

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 13,384 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 13,384 S.F.

= 112 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAY

BOTTOM FOREBAY EL. =	273.00	AREA =	225 S.F.
FOREBAY BERM EL. =	274.00	AREA =	546 S.F.

VOLUME PROVIDED = 386 C.F.

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JOB #: OE-2765 **CALC BY:** T.E.M. **DATE:** 03/01/18
JOB NAME: Timber Crest Estates **CHECK BY:** J.A.P. **DATE:** 03/01/18
TOWN: Medway

SEDIMENT FOREBAY SIZING CALCULATION FOR WATER QUALITY SWALE #1

TOTAL CONTRIBUTING IMPERVIOUS AREA TO FOREBAY

= 6,400 s.f.

REQUIRED VOLUME OF SEDIMENT FOREBAY = VOLUME PRODUCED BY 0.1" RUNOFF/IMPERVIOUS ACRE

REQ'D SED. FOREBAY VOLUME = 0.1" INCHES X $\frac{1 \text{ FT}}{12 \text{ IN}}$ X 6,400 S.F.

= 53 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAYS

FIRST FOREBAY	BOTTOM FOREBAY EL. =	263.00	AREA =	61	S.F.
	FOREBAY BERM EL. =	264.00	AREA =	177	S.F.
			VOLUME PROVIDED =	119	C.F.
SECOND FOREBAY	BOTTOM FOREBAY EL. =	263.00	AREA =	61	S.F.
	FOREBAY BERM EL. =	264.00	AREA =	177	S.F.
			VOLUME PROVIDED =	119	C.F.
			TOTAL VOLUME PROVIDED =	238	C.F.

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JOB #: OE-2765 **CALC BY:** T.E.M. **DATE:** 02/28/18
JOB NAME: Timber Crest Estates **CHECK BY:** J.A.P. **DATE:** 02/28/18
TOWN: Medway

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 #: OE-2765 **CALC BY:** T.E.M. **DATE:** 02/28/18
JOB NAME: Timber Crest Estates **CHECK BY:** J.A.P. **DATE:** 02/28/18
TOWN: Medway

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 $\frac{1\ FT}{12\ IN}$ X 4,896 S.F.

= 41 C.F.

PROVIDED VOLUME OF SEDIMENT FOREBAYS

FIRST FOREBAY	BOTTOM FOREBAY EL. =	271.00	AREA =	48	S.F.
	FOREBAY BERM EL. =	272.50	AREA =	285	S.F.
			VOLUME PROVIDED =	250	C.F.
SECOND FOREBAY	BOTTOM FOREBAY EL. =	271.00	AREA =	68	S.F.
	FOREBAY BERM EL. =	272.50	AREA =	329	S.F.
			VOLUME PROVIDED =	298	C.F.
			TOTAL VOLUME PROVIDED =	548	C.F.

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JOB #: OE-2765 **CALC BY:** T.E.M. **DATE:** 03/01/18
JOB NAME: Timber Crest Estates **CHECK BY:** J.A.P. **DATE:** 03/01/18
TOWN: Medway

SEDIMENT FOREBAY SIZING CALCULATION FOR WATER QUALITY SWALE #2

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 FOREBAYS

FIRST FOREBAY	BOTTOM FOREBAY EL. =	270.80	AREA =	36 S.F.
	FOREBAY BERM EL. =	272.00	AREA =	218 S.F.
			VOLUME PROVIDED =	152 C.F.
SECOND FOREBAY	BOTTOM FOREBAY EL. =	270.80	AREA =	45 S.F.
	FOREBAY BERM EL. =	272.00	AREA =	204 S.F.
			VOLUME PROVIDED =	149 C.F.
			TOTAL VOLUME PROVIDED =	302 C.F.

Appendix G

Pipe Calculations

Outback Engineering Incorporated

165 East Grove Street
Middleborough, MA 02346
Tel: 508-946-9231 Fax: 508-947-8873

JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway
Des. Storm: 2 year

CALC BY: T.E.M. **DATE:** 3/8/18
CHECK BY: J.A.P. **DATE:** 3/8/18

PIPE CAPACITY CALCULATIONS

MIN VELOCITY: 2 ft./sec. **MAX VELOCITY:** 10 ft./sec.

PIPE NETWORK TO LEACHING CHAMBER BED #3 (DETENTION BASIN #8A)

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-LC3A	DMH-LC3A	0.53	0.26	0.26	0.60	0.32	10	0.17	10.17	3.2	1.01
2	4	CB-LC3B	DMH-LC3A	0.37	0.16	0.21	0.56	0.21	10	0.11	10.11	3.2	0.67
3	4	DMH-LC3A	DMH-LC3	0.90	0.42	0.48	0.58	0.52	10	0.35	10.35	3.2	1.68
4	4	CB-LC3C	DMH-LC3	0.20	0.10	0.10	0.61	0.12	10	0.01	10.01	3.2	0.39
5	4	CB-LC3D	DMH-LC3	0.10	0.05	0.05	0.59	0.06	10	0.01	10.01	3.2	0.20
6	4	DMH-LC3	LC3	1.20	0.58	0.63	0.59	0.71	10	0.00	10.00	3.2	2.27

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	44	4.91	3.86	4.25	1.01	0.26	0.3	4.1	OK!
2	12	0.012	0.01	25	4.91	3.86	3.80	0.67	0.17	0.3	3.4	OK!
3	12	0.012	0.005	79	3.47	2.73	3.75	1.68	0.62	0.6	6.7	OK!
4	12	0.012	0.01	1	4.91	3.86	3.23	0.39	0.10	0.2	2.6	OK!
5	12	0.012	0.01	1	4.91	3.86	2.54	0.20	0.05	0.1	1.7	OK!
6	12	0.012	0.01	1	4.91	3.86	5.24	2.27	0.59	0.5	6.5	OK!

PIPE NETWORK TO LEACHING CHAMBER BED #4 (DETENTION BASIN #10)

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-LC4A	DMH-LC4	0.35	0.23	0.12	0.70	0.24	10	0.08	10.08	3.2	0.78
2	4	CB-LC4B	DMH-LC4	0.41	0.29	0.12	0.73	0.30	10	0.05	10.05	3.2	0.95
3	4	DMH-LC4	LC4	0.76	0.52	0.23	0.71	0.54	10	0.03	10.03	3.2	1.73

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	20	4.91	3.86	3.97	0.78	0.20	0.3	3.7	OK!
2	12	0.012	0.01	12	4.91	3.86	4.18	0.95	0.25	0.3	4.0	OK!
3	12	0.012	0.05	18	10.99	8.63	8.87	1.73	0.20	0.3	3.7	OK!

Outback Engineering Incorporated

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JOB #: OE-2765
JOB NAME: Timber Crest Estates
TOWN: Medway
Des. Storm: 25 year

CALC BY: T.E.M. **DATE:** 3/15/18
CHECK BY: J.A.P. **DATE:** 3/15/18

PIPE CAPACITY CALCULATIONS

MIN VELOCITY: 2 ft./sec. **MAX VELOCITY:** 10 ft./sec.

PIPE NETWORK TO WATER QUALITY SWALE #1

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-WQSA	DMH-WQS	0.19	0.10	0.09	0.63	0.12	10	0.09	10.09	5	0.60
2	4	CB-WQSB	DMH-WQS	0.37	0.07	0.30	0.41	0.15	10	0.08	10.08	5	0.77
3	4	DMH-WQS	FE-WQS	0.56	0.17	0.39	0.49	0.27	10	0.13	10.13	5	1.37

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	20	4.91	3.86	3.69	0.60	0.16	0.3	3.2	**OK!**
2	12	0.012	0.01	20	4.91	3.86	3.96	0.77	0.20	0.3	3.6	**OK!**
3	12	0.012	0.02	46	6.95	5.46	5.94	1.37	0.25	0.3	4.1	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #1

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-1D	DMH-1C	0.44	0.18	0.25	0.55	0.24	10	0.07	10.07	5	1.21
2	4	CB-1E	DMH-1C	0.23	0.10	0.12	0.57	0.13	10	0.09	10.09	5	0.66
3	4	CB-1F	DMH-1C	1.15	0.28	0.86	0.45	0.51	10	0.13	10.13	5	2.56
4	4	DMH-1C	DMH-1B	1.81	0.57	1.24	0.49	0.89	10	0.29	10.29	5	4.43
5	4	CB-1A	DMH-1B	0.12	0.07	0.06	0.63	0.08	10	0.08	10.08	5	0.39
6	4	CB-1B	DMH-1B	0.15	0.07	0.08	0.58	0.09	10	0.11	10.11	5	0.44
7	4	DMH-1B	DMH-1A	2.09	0.71	1.38	0.50	1.05	10	0.07	10.07	5	5.26
8	4	CB-1C	DMH-1A	0.83	0.00	0.83	0.30	0.25	10	0.34	10.34	5	1.24
9	4	DMH-1A	FE-1	2.91	0.71	2.21	0.45	1.30	10	0.38	10.38	5	6.50

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	18	4.91	3.86	4.44	1.21	0.31	0.4	4.5	**OK!**
2	12	0.012	0.01	20	4.91	3.86	3.79	0.66	0.17	0.3	3.4	**OK!**
3	12	0.012	0.025	58	7.77	6.10	7.58	2.56	0.42	0.4	5.3	**OK!**
4	12	0.012	0.021	142	7.12	5.59	8.07	4.43	0.79	0.7	7.9	**OK!**
5	12	0.012	0.01	15	4.91	3.86	3.23	0.39	0.10	0.2	2.6	**OK!**
6	12	0.012	0.01	22	4.91	3.86	3.36	0.44	0.11	0.2	2.7	**OK!**
7	12	0.012	0.021	35	7.12	5.59	8.30	5.26	0.94	0.7	8.9	**OK!**
8	12	0.012	0.01	90	4.91	3.86	4.47	1.24	0.32	0.4	4.6	**OK!**

9	18	0.012	0.004	107	4.07	7.20	4.71	6.50	0.90	0.7	12.9	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #2

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-2C	DMH-2C	0.26	0.14	0.12	0.62	0.16	10	0.06	10.06	5	0.81
2	4	CB-2D	DMH-2C	0.53	0.17	0.36	0.49	0.26	10	0.08	10.08	5	1.30
3	4	DMH-2C	DMH-2B	0.79	0.31	0.48	0.53	0.42	10	1.08	11.08	5	2.11
4	4	CB-2A	DMH-2B	0.52	0.26	0.26	0.60	0.31	10	0.03	10.03	5	1.54
5	4	CB-2B	DMH-2B	0.48	0.20	0.28	0.55	0.27	10	0.20	10.20	5	1.33
6	4	DMH-2B	DMH-2A	1.79	0.77	1.02	0.56	1.00	10	0.10	10.10	5	4.99
7	4	DMH-2A	FE-2	1.79	0.77	1.02	0.56	1.00	10	0.29	10.29	5	4.99

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	14	4.91	3.86	4.01	0.81	0.21	0.3	3.7	**OK!**
2	12	0.012	0.01	21	4.91	3.86	4.53	1.30	0.34	0.4	4.7	**OK!**
3	12	0.012	0.0075	300	4.26	3.34	4.62	2.11	0.63	0.6	6.8	**OK!**
4	12	0.012	0.01	9	4.91	3.86	4.73	1.54	0.40	0.4	5.1	**OK!**
5	12	0.012	0.01	56	4.91	3.86	4.55	1.33	0.35	0.4	4.7	**OK!**
6	18	0.012	0.01	39	6.44	11.38	6.36	4.99	0.44	0.5	8.1	**OK!**
7	18	0.012	0.01	111	6.44	11.38	6.36	4.99	0.44	0.5	8.1	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #3

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-3A	DMH-3A	1.77	0.48	1.29	0.46	0.82	10	0.06	10.06	5	4.08
2	4	CB-3B	DMH-3A	0.34	0.20	0.14	0.65	0.22	10	0.04	10.04	5	1.09
3	4	DMH-3A	FE-3A	2.10	0.67	1.43	0.49	1.04	10	0.06	10.06	5	5.18
4	4	CB-3C	DMH-3B	0.43	0.23	0.20	0.62	0.27	10	0.05	10.05	5	1.33
5	4	CB-3D	DMH-3B	0.20	0.12	0.08	0.67	0.14	10	0.08	10.08	5	0.68
6	4	DMH-3B	FE-3B	0.63	0.35	0.28	0.64	0.40	10	0.12	10.12	5	2.01

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	21	4.91	3.86	5.78	4.08	1.06	0.9	10.5	**OK!**
2	12	0.012	0.01	11	4.91	3.86	4.33	1.09	0.28	0.4	4.3	**OK!**
3	12	0.012	0.017	25	6.41	5.03	7.57	5.18	1.03	0.8	10.0	**OK!**
4	12	0.012	0.01	14	4.91	3.86	4.55	1.33	0.35	0.4	4.7	**OK!**
5	12	0.012	0.01	19	4.91	3.86	3.82	0.68	0.18	0.3	3.4	**OK!**
6	12	0.012	0.013	41	5.60	4.40	5.60	2.01	0.46	0.5	5.5	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #4

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-4	DMH-4	1.36	0.66	0.69	0.59	0.81	10	0.04	10.04	5	4.03
2	4	DMH-4	FE-4	1.36	0.66	0.69	0.59	0.81	10	0.46	10.46	5	4.03

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	14	4.91	3.86	5.80	4.03	1.04	0.9	10.2	**OK!**
2	12	0.012	0.01	160	4.91	3.86	5.80	4.03	1.04	0.9	10.2	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #5

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-5A	DMH-5B	0.10	0.07	0.03	0.72	0.07	10	0.25	10.25	5	0.37
2	4	CB-5B	DMH-5B	0.01	0.01	0.00	0.85	0.01	10	0.23	10.23	5	0.05
3	4	DMH-5B	DMH-5A	0.11	0.08	0.03	0.73	0.08	10	0.33	10.33	5	0.42
4	4	DMH-5A	DMH-5	0.11	0.08	0.03	0.73	0.08	10	0.59	10.59	5	0.42
5	4	CB-5	DMH-5	0.83	0.46	0.37	0.63	0.52	10	0.04	10.04	5	2.62
6	4	DMH-5	FE-5	0.95	0.54	0.41	0.64	0.61	10	0.36	10.36	5	3.04

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	47	4.91	3.86	3.18	0.37	0.10	0.2	2.5	**OK!**
2	12	0.012	0.02	29	6.95	5.46	2.15	0.05	0.01	0.1	0.8	**OK!**
3	12	0.012	0.01	65	4.91	3.86	3.31	0.42	0.11	0.2	2.7	**OK!**
4	12	0.012	0.01	117	4.91	3.86	3.31	0.42	0.11	0.2	2.7	**OK!**
5	12	0.012	0.01	12	4.91	3.86	5.42	2.62	0.68	0.6	7.2	**OK!**
6	12	0.012	0.009	115	4.66	3.66	5.32	3.04	0.83	0.7	8.1	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #6

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-6A	DMH-6A	0.37	0.19	0.18	0.61	0.23	10	0.06	10.06	5	1.13
2	4	CB-6B	DMH-6A	0.14	0.10	0.04	0.72	0.10	10	0.09	10.09	5	0.52
3	4	DMH-6A	DMH-6B	0.52	0.29	0.22	0.64	0.33	10	0.36	10.36	5	1.65
4	4	DMH-6B	DMH-6C	0.52	0.29	0.22	0.64	0.33	10	0.56	10.56	5	1.65
5	4	CULVERT	DMH-6C	0.78	0.00	0.78	0.30	0.23	15	0.17	15.17	4.5	1.06
6	4	DMH-6C	DMH-6D	1.30	0.29	1.01	0.43	0.57	15	0.38	15.38	4.5	2.54
7	4	CB-6C	DMH-6D	1.00	0.54	0.46	0.62	0.62	10	0.04	10.04	5	3.12
8	4	DMH-6D	FE-6	2.30	0.83	1.47	0.52	1.19	15	0.09	15.09	4.5	5.35

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	17	4.91	3.86	4.37	1.13	0.29	0.4	4.4	**OK!**
2	12	0.012	0.01	20	4.91	3.86	3.54	0.52	0.13	0.2	3.0	**OK!**
3	12	0.012	0.01	103	4.91	3.86	4.82	1.65	0.43	0.4	5.3	**OK!**
4	12	0.012	0.01	163	4.91	3.86	4.82	1.65	0.43	0.4	5.3	**OK!**
5	12	0.012	0.01	43	4.91	3.86	4.29	1.06	0.27	0.4	4.2	**OK!**
6	12	0.012	0.005	93	3.47	2.73	4.04	2.54	0.93	0.7	8.8	**OK!**
7	12	0.012	0.011	14	5.15	4.05	5.81	3.12	0.77	0.6	7.8	**OK!**
8	18	0.012	0.006	29	4.99	8.81	5.37	5.35	0.61	0.6	10.0	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #7

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-7A	DMH-7A	0.61	0.38	0.23	0.67	0.41	10	0.09	10.09	5	2.04
2	4	CB-7B	DMH-7A	0.51	0.43	0.07	0.81	0.41	10	0.07	10.07	5	2.06
3	4	DMH-7A	DMH-7B	1.11	0.81	0.30	0.74	0.82	10	0.21	10.21	5	4.10
4	4	DMH-7B	FE-7	1.11	0.81	0.30	0.74	0.82	10	0.10	10.10	5	4.10

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	28	4.91	3.86	5.11	2.04	0.53	0.5	6.1	**OK!**
2	12	0.012	0.01	20	4.91	3.86	5.12	2.06	0.53	0.5	6.1	**OK!**
3	12	0.012	0.01	74	4.91	3.86	5.76	4.10	1.06	0.9	10.6	**OK!**

4	12	0.012	0.01	36	4.91	3.86	5.76	4.10	1.06	0.9	10.6	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #8

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-8A	DMH-8A	0.51	0.30	0.21	0.65	0.33	10	0.26	10.26	5	1.67
2	4	CB-8B	DMH-8A	0.30	0.19	0.11	0.68	0.20	10	0.04	10.04	5	1.01
3	4	CB-8C	DMH-8A	0.30	0.18	0.12	0.66	0.20	10	0.07	10.07	5	0.99
4	4	DMH-8A	DMH-8B	1.11	0.67	0.44	0.66	0.74	10	0.39	10.39	5	3.68
5	4	CB-8D	DMH-8B	0.27	0.14	0.13	0.61	0.16	10	0.08	10.08	5	0.82
6	4	CB-8E	DMH-8B	0.21	0.17	0.04	0.79	0.17	10	0.10	10.10	5	0.85
7	4	DMH-8B	FE-8	1.60	0.98	0.61	0.67	1.07	10	0.07	10.07	5	5.34

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.015	87	6.02	4.73	5.61	1.67	0.35	0.4	4.8	**OK!**
2	12	0.012	0.01	9	4.91	3.86	4.25	1.01	0.26	0.3	4.1	**OK!**
3	12	0.012	0.01	17	4.91	3.86	4.22	0.99	0.26	0.3	4.1	**OK!**
4	12	0.012	0.0125	147	5.49	4.32	6.30	3.68	0.85	0.7	8.2	**OK!**
5	12	0.012	0.01	19	4.91	3.86	4.03	0.82	0.21	0.3	3.8	**OK!**
6	12	0.012	0.01	24	4.91	3.86	4.06	0.85	0.22	0.3	3.8	**OK!**
7	12	0.012	0.016	30	6.22	4.88	6.99	5.34	1.09	0.9	11.3	**OK!**

PIPE NETWORK TO LEACHING CHAMBER BED #3 (DETENTION BASIN #8A)

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-LC3A	DMH-LC3A	0.53	0.26	0.26	0.60	0.32	10	0.15	10.15	5	1.58
2	4	CB-LC3B	DMH-LC3A	0.37	0.16	0.21	0.56	0.21	10	0.10	10.10	5	1.04
3	4	DMH-LC3A	DMH-LC3	0.90	0.42	0.48	0.58	0.52	10	0.32	10.32	5	2.62
4	4	CB-LC3C	DMH-LC3	0.20	0.10	0.10	0.61	0.12	10	0.00	10.00	5	0.61
5	4	CB-LC3D	DMH-LC3	0.10	0.05	0.05	0.59	0.06	10	0.01	10.01	5	0.31
6	4	DMH-LC3	LC3	1.20	0.58	0.63	0.59	0.71	10	0.00	10.00	5	3.54

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	44	4.91	3.86	4.77	1.58	0.41	0.4	5.2	**OK!**
2	12	0.012	0.01	25	4.91	3.86	4.28	1.04	0.27	0.4	4.2	**OK!**
3	12	0.012	0.005	79	3.47	2.73	4.07	2.62	0.96	0.8	9.1	**OK!**
4	12	0.012	0.01	1	4.91	3.86	3.71	0.61	0.16	0.3	3.3	**OK!**
5	12	0.012	0.01	1	4.91	3.86	2.98	0.31	0.08	0.2	2.2	**OK!**
6	12	0.012	0.01	1	4.91	3.86	5.70	3.54	0.92	0.7	8.7	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #9

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-9A	DMH-9	0.21	0.14	0.07	0.70	0.15	10	0.07	10.07	5	0.73
2	4	CB-9B	DMH-9	0.38	0.26	0.12	0.71	0.27	10	0.04	10.04	5	1.34
3	4	DMH-9	FE-9	0.58	0.40	0.19	0.71	0.41	10	0.14	10.14	5	2.07

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	17	4.91	3.86	3.90	0.73	0.19	0.3	3.6	**OK!**
2	12	0.012	0.01	12	4.91	3.86	4.56	1.34	0.35	0.4	4.7	**OK!**
3	12	0.012	0.01	42	4.91	3.86	5.12	2.07	0.54	0.5	6.1	**OK!**

PIPE NETWORK TO LEACHING CHAMBER BED #4 (DETENTION BASIN #10)

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-LC4A	DMH-LC4	0.35	0.23	0.12	0.70	0.24	10	0.07	10.07	5	1.22
2	4	CB-LC4B	DMH-LC4	0.41	0.29	0.12	0.73	0.30	10	0.04	10.04	5	1.49
3	4	DMH-LC4	LC4	0.76	0.52	0.23	0.71	0.54	10	0.03	10.03	5	2.71

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	20	4.91	3.86	4.45	1.22	0.32	0.4	4.5	**OK!**
2	12	0.012	0.01	12	4.91	3.86	4.69	1.49	0.39	0.4	5.0	**OK!**
3	12	0.012	0.05	18	10.99	8.63	9.94	2.71	0.31	0.4	4.5	**OK!**

PIPE NETWORK TO WATER QUALITY SWALE #2

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-11A	DMH-11	0.29	0.18	0.11	0.68	0.19	10	0.08	10.08	5	0.97
2	4	CB-11B	DMH-11	0.26	0.20	0.06	0.77	0.20	10	0.04	10.04	5	1.00
3	4	DMH-11	FE-11	0.55	0.38	0.16	0.72	0.39	10	0.08	10.08	5	1.97

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	21	4.91	3.86	4.20	0.97	0.25	0.3	4.1	**OK!**
2	12	0.012	0.01	9	4.91	3.86	4.23	1.00	0.26	0.3	4.1	**OK!**
3	12	0.012	0.01	24	4.91	3.86	5.06	1.97	0.51	0.5	5.9	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #12

PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-12	FE-12	0.77	0.52	0.25	0.71	0.54	10	0.33	10.33	5	2.72

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.01	109	4.91	3.86	5.45	2.72	0.71	0.6	7.3	**OK!**

PIPE NETWORK TO INFILTRATION BASIN #15

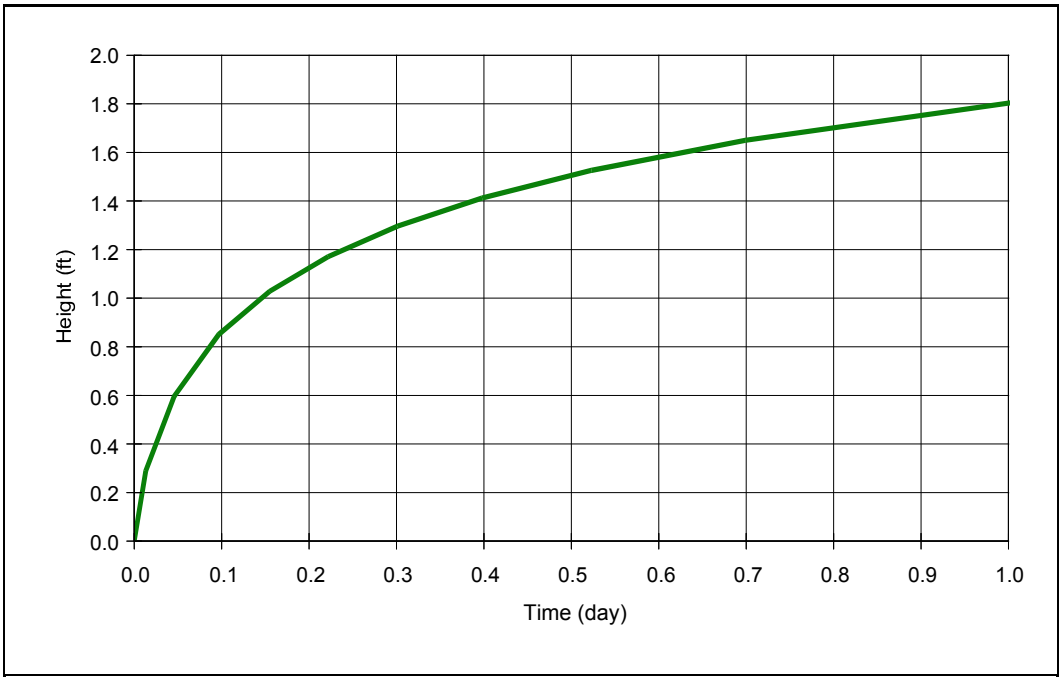
PIPE DESCRIPTION				DRAINAGE AREA (acres)	IMPERV. AREA (acres)	PERV. AREA (acres)	C perv.= 0.30 imp.=0.90	CA	TIME OF CONC. (min.)			I (in./hr)	Qc=CIA (cfs)
LENGTH #	DA #	FROM	TO						Inlet (min.)	Drain (min.)	Total (min.)		
1	4	CB-15	DMH-15	0.29	0.07	0.22	0.44	0.13	10	0.95	10.95	5	0.65
2	4	DMH-15	FE-15	0.29	0.07	0.22	0.44	0.13	10	0.22	10.22	5	0.65

LENGTH #	PIPE DIAMETER (in.)	PIPE MATERIAL (n-value)	SLOPE (ft./ft.)	LENGTH (ft)	FULL FLOW		CURRENT FLOW					
					Vf (ft/sec)	Qf (cfs)	Vc (ft/sec)	Qc (cfs)	Qc/Qf	d/D (in.)	Depth of flow in pipe (in)	
1	12	0.012	0.006	178	3.81	2.99	3.14	0.65	0.22	0.3	3.8	**OK!**
2	12	0.012	0.006	42	3.81	2.99	3.14	0.65	0.22	0.3	3.8	**OK!**

Appendix H

Groundwater Mounding Calculations

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 2 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 12:54:56 PM

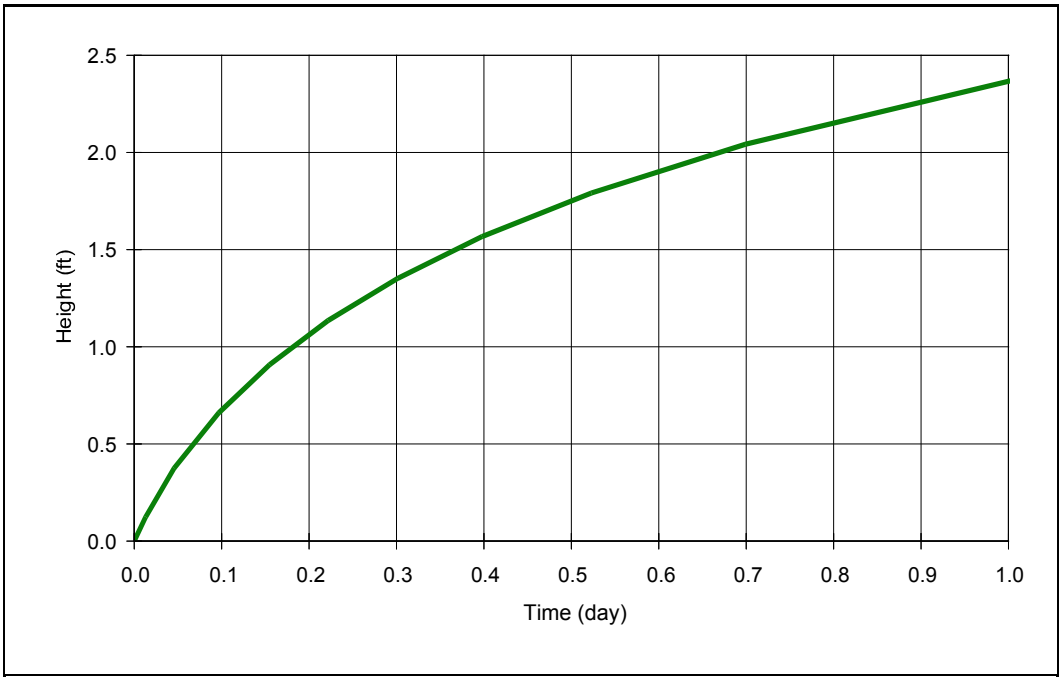
INPUT PARAMETERS

Application rate: 14.67 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 200 ft/day
Initial saturated thickness: 20 ft
Length of application area: 100 ft
Width of application area: 15 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 22005 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.29
0	0.6
0.1	0.85
0.2	1.03
0.2	1.17
0.3	1.3
0.4	1.41
0.5	1.53
0.7	1.65
1	1.8

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 4 - TIMERCREST

ANALYST: TOM MORRIS

DATE: 3/5/2018 TIME: 7:52:50 AM

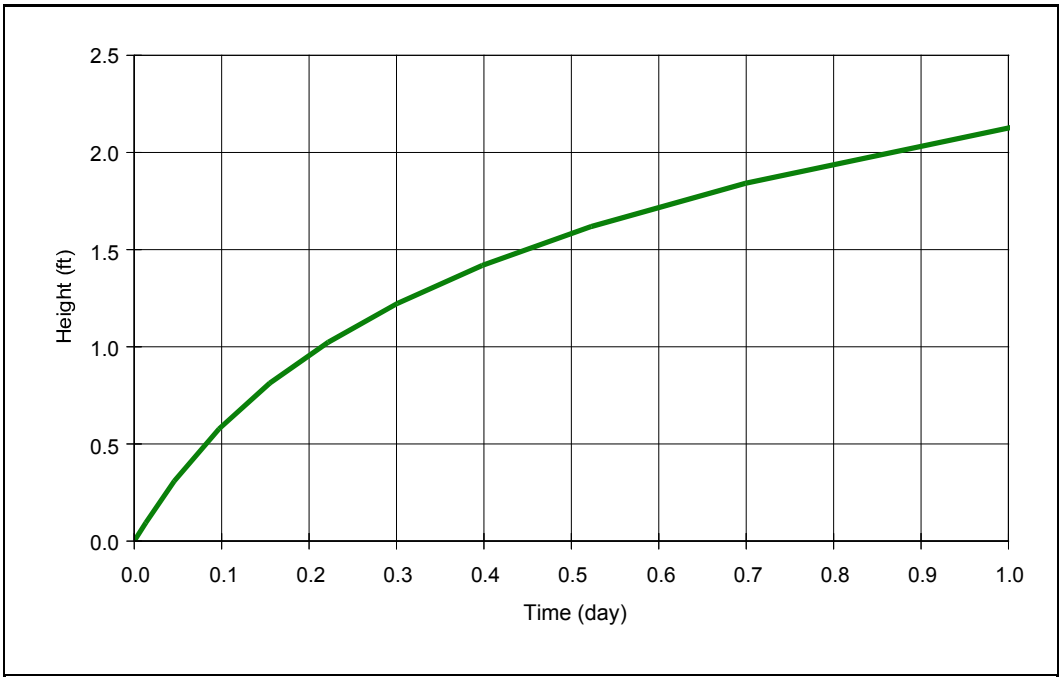
INPUT PARAMETERS

Application rate: 3.4 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 130 ft
Width of application area: 35 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 15470 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.12
0	0.38
0.1	0.66
0.2	0.91
0.2	1.14
0.3	1.35
0.4	1.57
0.5	1.79
0.7	2.04
1	2.37

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 5 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 12:56:11 PM

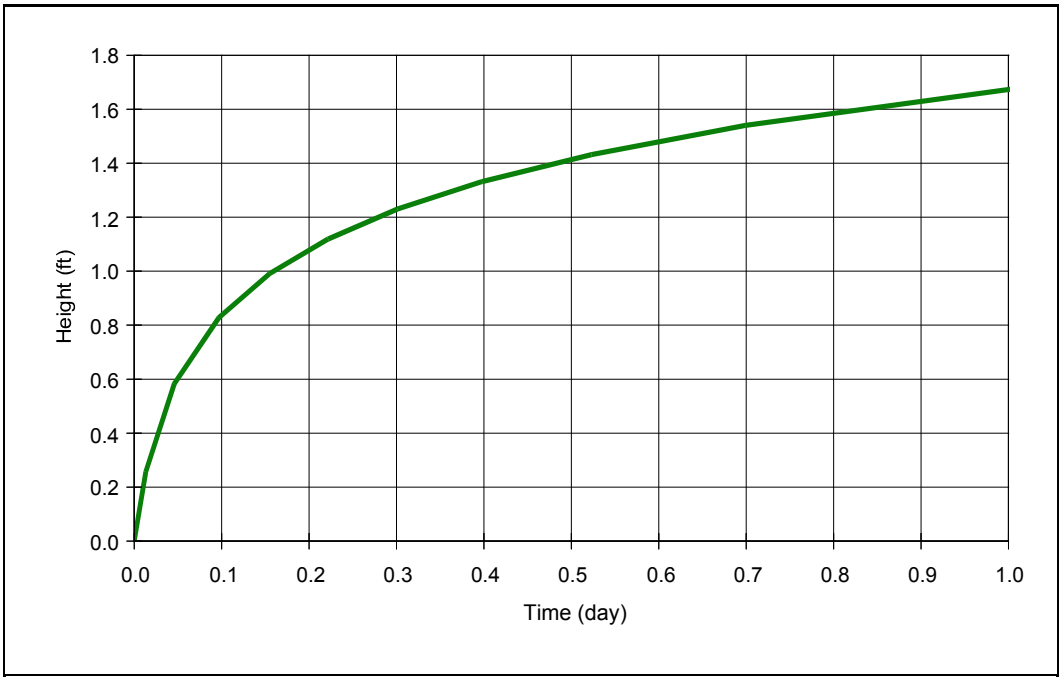
INPUT PARAMETERS

Application rate: 2.51 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 105 ft
Width of application area: 50 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 13177.5 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.09
0	0.31
0.1	0.58
0.2	0.81
0.2	1.02
0.3	1.22
0.4	1.42
0.5	1.62
0.7	1.84
1	2.13

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 12 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 12:57:12 PM

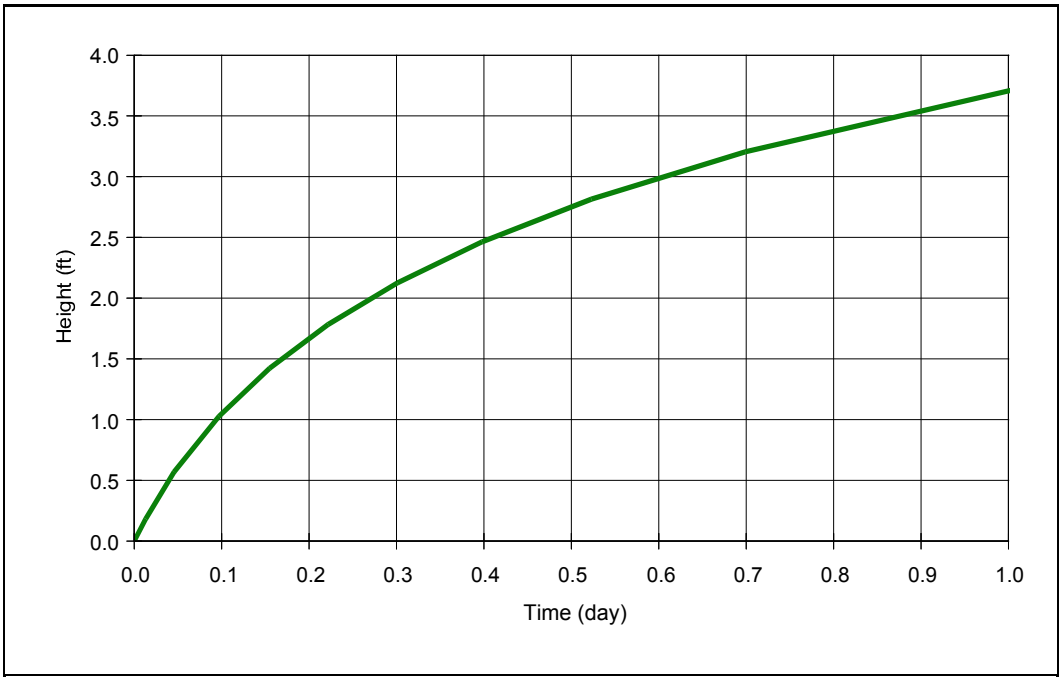
INPUT PARAMETERS

Application rate: 7.62 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 200 ft/day
Initial saturated thickness: 20 ft
Length of application area: 55 ft
Width of application area: 45 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 18859.5 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.26
0	0.58
0.1	0.83
0.2	0.99
0.2	1.12
0.3	1.23
0.4	1.33
0.5	1.43
0.7	1.54
1	1.67

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 6 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 12:56:31 PM

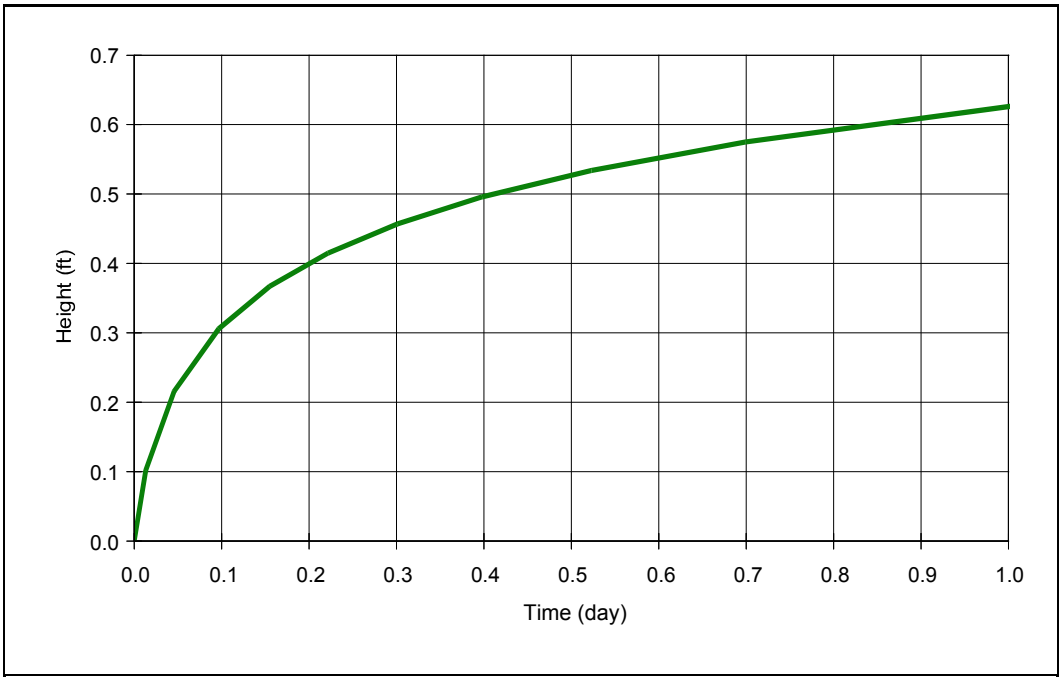
INPUT PARAMETERS

Application rate: 4.92 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 120 ft
Width of application area: 40 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 23616 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.18
0	0.57
0.1	1.03
0.2	1.42
0.2	1.78
0.3	2.13
0.4	2.46
0.5	2.82
0.7	3.2
1	3.71

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 15 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 12:57:47 PM

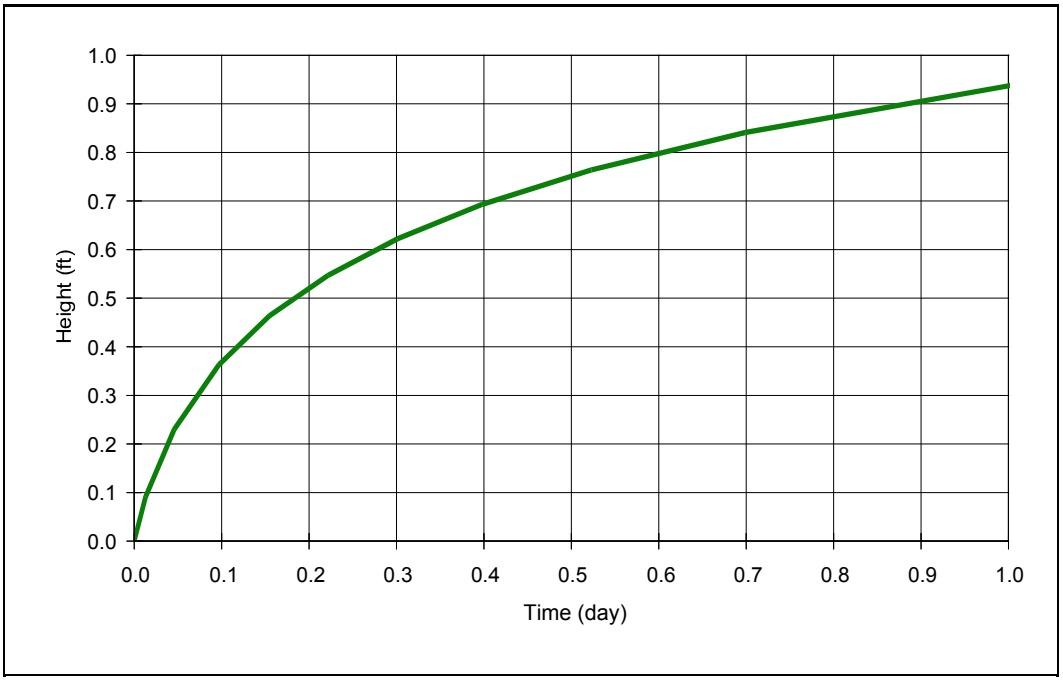
INPUT PARAMETERS

Application rate: 4.03 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 45 ft
Width of application area: 12 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 2176.2 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.1
0	0.22
0.1	0.31
0.2	0.37
0.2	0.42
0.3	0.46
0.4	0.5
0.5	0.53
0.7	0.57
1	0.63

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 14 - TIMERCREST

ANALYST: TOM MORRIS

DATE: 3/5/2018 TIME: 7:56:27 AM

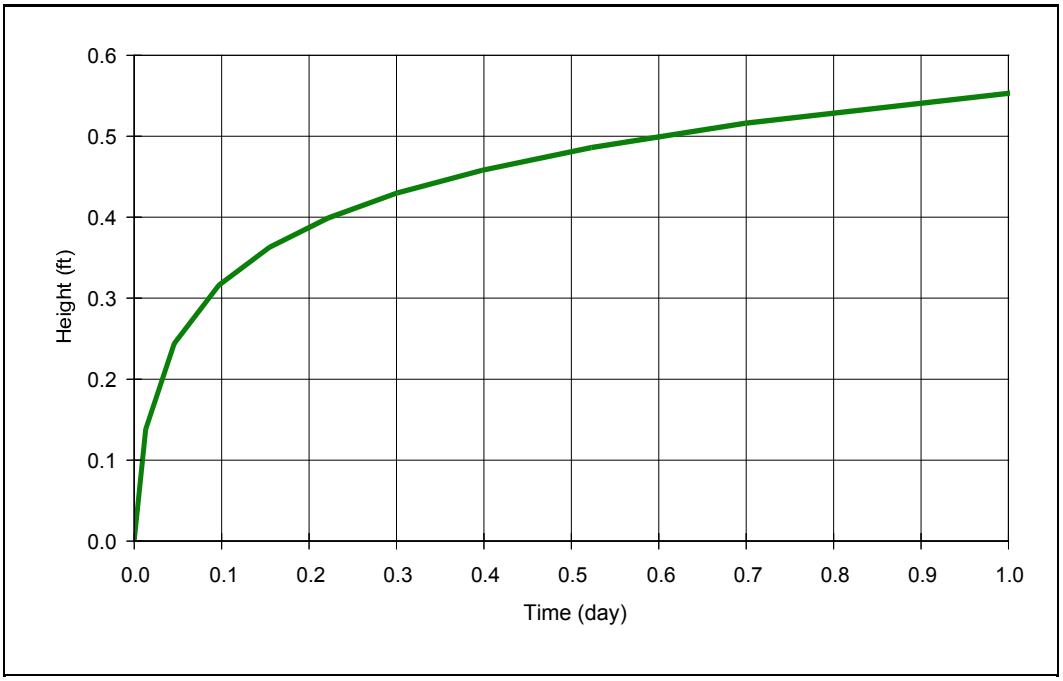
INPUT PARAMETERS

Application rate: 2.82 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 75 ft
Width of application area: 20 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 4230 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.09
0	0.23
0.1	0.36
0.2	0.46
0.2	0.55
0.3	0.62
0.4	0.69
0.5	0.76
0.7	0.84
1	0.94

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: BASIN 16 - TIMERCREST

ANALYST: TOM MORRIS

DATE: 3/5/2018 TIME: 7:57:36 AM

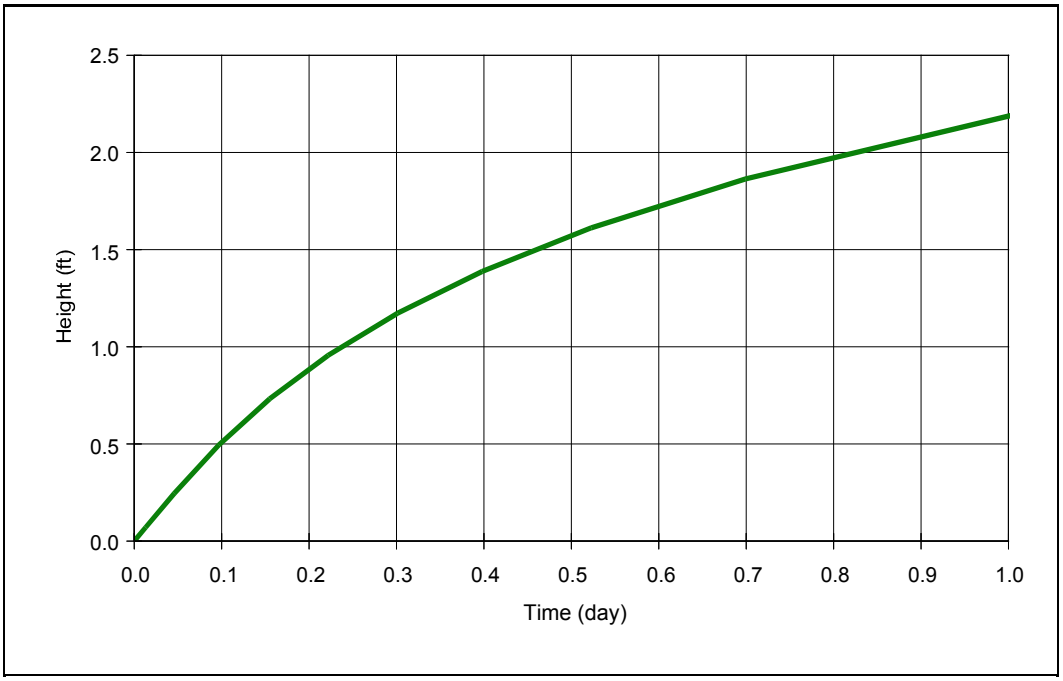
INPUT PARAMETERS

Application rate: 8.64 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 200 ft/day
Initial saturated thickness: 20 ft
Length of application area: 50 ft
Width of application area: 12 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 5184 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.14
0	0.24
0.1	0.32
0.2	0.36
0.2	0.4
0.3	0.43
0.4	0.46
0.5	0.49
0.7	0.52
1	0.55

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: RAIN GARDEN 1 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 1:00:04 PM

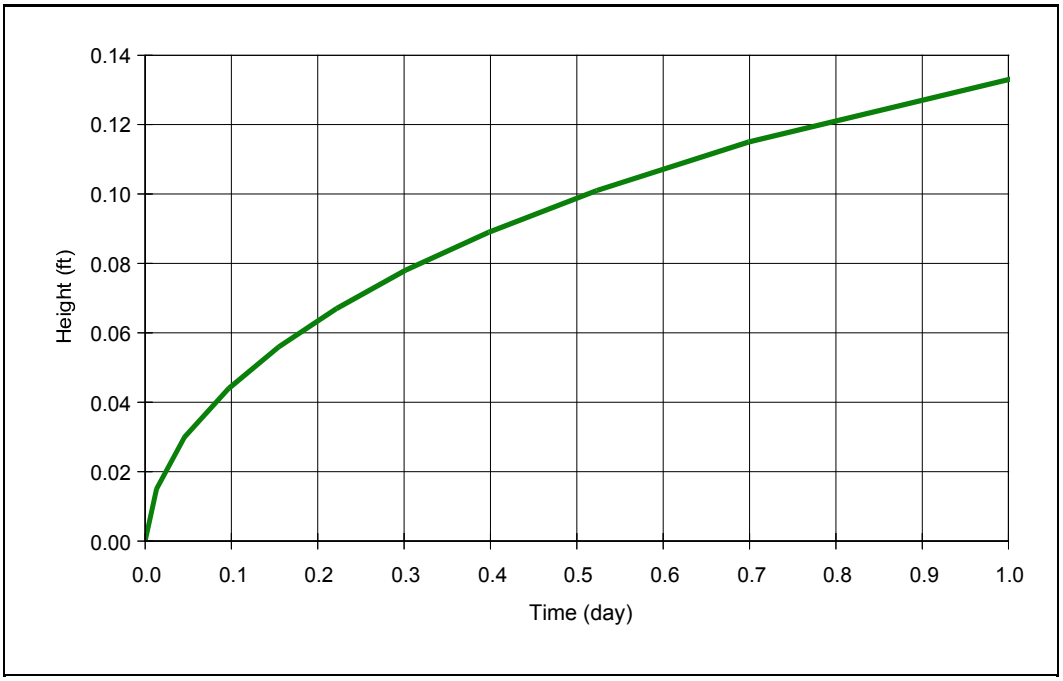
INPUT PARAMETERS

Application rate: 1.89 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 8 ft
Length of application area: 65 ft
Width of application area: 50 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 6142.5 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.07
0	0.24
0.1	0.5
0.2	0.73
0.2	0.96
0.3	1.17
0.4	1.39
0.5	1.61
0.7	1.86
1	2.19

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: RAIN GARDEN 2 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 1:00:24 PM

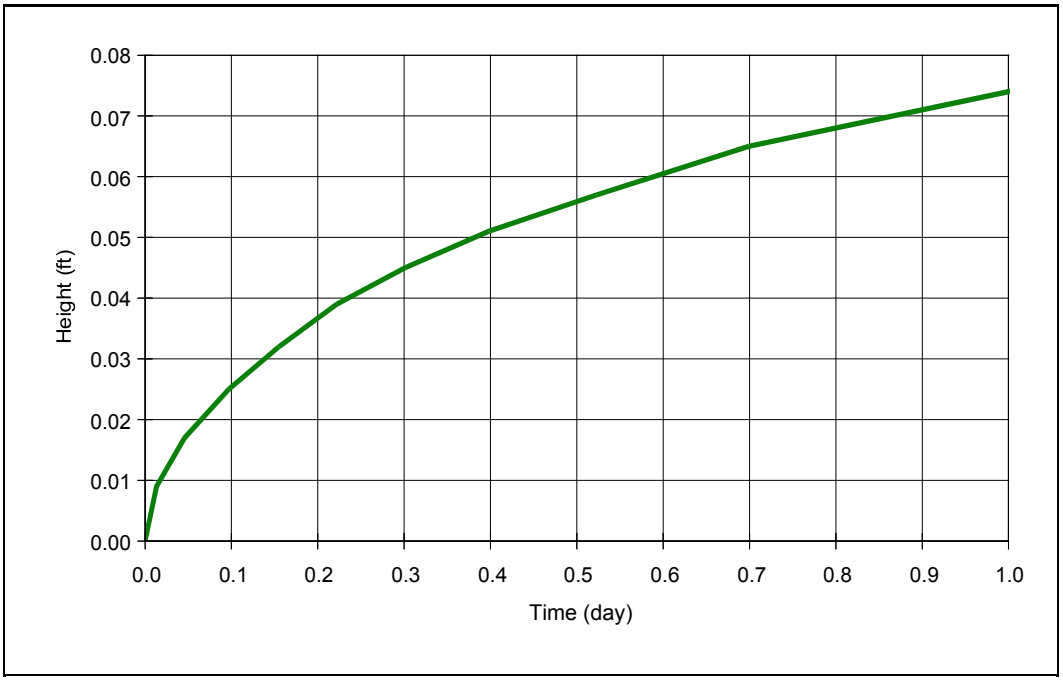
INPUT PARAMETERS

Application rate: 1.77 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 180 ft
Width of application area: 3 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 955.8 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.02
0	0.03
0.1	0.04
0.2	0.06
0.2	0.07
0.3	0.08
0.4	0.09
0.5	0.1
0.7	0.12
1	0.13

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: RAIN GARDEN 3 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 1:00:39 PM

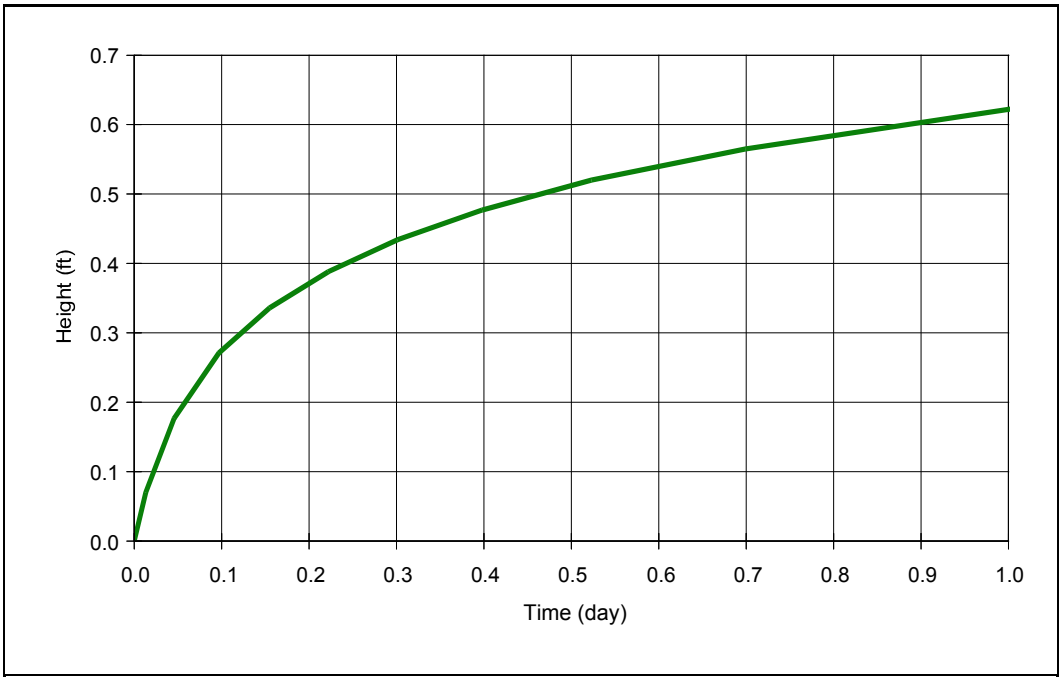
INPUT PARAMETERS

Application rate: 1.03 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 155 ft
Width of application area: 3 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 478.95 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.01
0	0.02
0.1	0.02
0.2	0.03
0.2	0.04
0.3	0.04
0.4	0.05
0.5	0.06
0.7	0.06
1	0.07

Groundwater Mounding Analysis (Hantush's Method using Glover's Solution)



COMPANY: OUTBACK ENGINEERING INC.

PROJECT: RAIN GARDEN 6 - TIMBERCREST

ANALYST: TOM MORRIS

DATE: 9/11/2017 TIME: 1:00:55 PM

INPUT PARAMETERS

Application rate: 2.03 c.ft/day/sq. ft
Duration of application: 1 day
Total simulation time: 1 day
Fillable porosity: 0.35
Hydraulic conductivity: 60 ft/day
Initial saturated thickness: 20 ft
Length of application area: 50 ft
Width of application area: 24 ft
No constant head boundary used
Groundwater mounding @
X coordinate: 0 ft
Y coordinate: 0 ft
Total volume applied: 2436 cft

MODEL RESULTS

Time (day)	Mound Height (ft)
0	0
0	0.07
0	0.18
0.1	0.27
0.2	0.34
0.2	0.39
0.3	0.43
0.4	0.48
0.5	0.52
0.7	0.56
1	0.62

GROUNDWATER MOUNDING SUMMARY
TIMBER CREST ESTATES
March 15, 2018

Infiltration Practice	Discarded Volume (acre-feet)	Length of Application (ft)	Width of Application (ft)	Application Rate ($ft^3/day/ft^2$)	Duration of Application	Fillable Porosity	Hydraulic Conductivity (ft/day)	Saturated Thickness (ft)	Mound Height * (ft)	Separation to Groundwater (ft)
Infiltration Basin 2	0.505	100	15	14.67	1 day	0.35	200	20	1.8	2.1
Infiltration Basin 4	0.355	130	35	3.40			60	20	2.37	3.2
Infiltration Basin 5	0.303	105	50	2.51			60	20	2.13	3.4
Infiltration Basin 6	0.542	120	40	4.92			60	20	3.71	3.8
Infiltration Basin 12	0.433	55	45	7.62			200	20	1.67	2.3
Infiltration Basin 14	0.122	75	20	2.82			60	20	0.94	2.5
Infiltration Basin 15	0.050	45	12	4.03			60	20	0.63	2.9
Infiltration Basin 16	0.108	50	12	8.64			200	20	0.55	2.0
Leaching Chamber 3	0.175	172	11.33	3.91			60	20	1.06	2.0
Leaching Chamber 4	0.024	35.5	16.5	1.78			9	20	1.24	3.2
Rain Garden 1	0.141	60	45	1.89			60	8	2.19	2.2
Rain Garden 2	0.022	180	3	1.77			60	20	0.13	2.6
Rain Garden 3	0.011	155	3	1.03			60	20	0.07	2.1
Rain Garden 6	0.056	50	24	2.03			60	20	0.62	2.7

* see attached Groundwater Mounding Analysis calculation sheets

Timber Crest Estates
Groundwater Mounding Assessment

Per the DEP Stormwater Management Regulations, groundwater mounding analysis beneath infiltration systems within jurisdiction of the Wetlands Protection Act are required when the bottom of an infiltration drainage system is within 4 ft. of the seasonal high water table. The attached table summarizes the mound heights calculated at each such BMP for the 100-yr. storm, and notes the available separation to groundwater before the mound occurs.

The groundwater mounding calculations were performed using software developed by GeoHydroCycle, Inc. of Natick MA. This software program is based on the Hantush Method using Glover's Solution. Using the Hantush Method, a number of input parameters are required in order to compute the groundwater mound height. All input parameters used have been derived using standard practices and readily available information from the site plans, soil test pits and drainage calculations prepared for the project. The following are the input parameters used in the mounding calculations:

Application Rate: Is the volume of water that is infiltrated by each BMP in the 100-yr. storm (denoted as "Discarded Volume" in the provided HydroCAD calculations) divided by the wetted area of the infiltration practice.

Duration of Application: The duration is 1 day to match the 100-year, 24-hour storm events.

Fillable Porosity: This is a value based on the soil classification found at the location of the infiltration practice. The attached graph by Walton demonstrates the porosity for all soil types in this case can be fairly characterized as 0.35.

Hydraulic Conductivity: The values used in the Hantush method were estimated based on the attached graph by Anderson & Woessner and our assessment of the soil test pits performed within the infiltration BMP on site; 9 ft/day for Sandy Loams, 60 ft/day for Loamy Sands, and 200 ft/day for Coarse Sands & Gravels.

Initial Saturated Thickness: This value represents the depth to the highest natural restrictive layer (clay or bedrock). In a few cases bedrock was encountered in the on-site observation holes so the actual observed depth was used. When it was not observed this value was estimated from a Well Completion Report from the MassDEP Search Well database, where the well is located at 9 Ohlson Circle (see attached well report), and the initial saturated thickness is the depth to bedrock in the well report (20').

Length of application area: The length of the proposed infiltration practice bottom.

Width of application area: The width of the proposed infiltration practice bottom.

Appendix I

Long-Term Pollution Prevention Plan (Standards #4-6)

Timber Crest Estates
Long-Term Pollution Prevention Plan

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.

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 J

Long-Term Operation & Maintenance Plan and Log Form (Standard #9)

TIMBER CREST SUBDIVISION – Medway, MA
Drainage System
Long-Term Operation & Maintenance Plan

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. This O & M Plan shall be adhered to by the Developer and his successors as phases of the project are completed.

Snow disposal shall be carried out by the developer, town, 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 all roadways, including the emergency access roads to Ohlson Circle and Fairway Lane, to ensure accessibility for emergency vehicles. Snow shall not be placed in the drainage basins or any wetlands because (1) snow combined with sand and debris may block a storm drainage system, causing localized flooding, and (2) a high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into wetlands.

<u>Drainage Swales, Culverts and Roadways</u>
Refer to the Inspection & Maintenance Form for required 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 2 and 3, 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 required 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 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			
Water Quality Swale 2			
Infiltration Basin 12			
Infiltration Basin 14			
Infiltration Basin 15			
Infiltration Basin 16			

OTHER REQUIRED MAINTENANCE:

_____

_____

_____

_____

TO BE PERFORMED BY:_____

ON OR BEFORE:_____

Appendix K

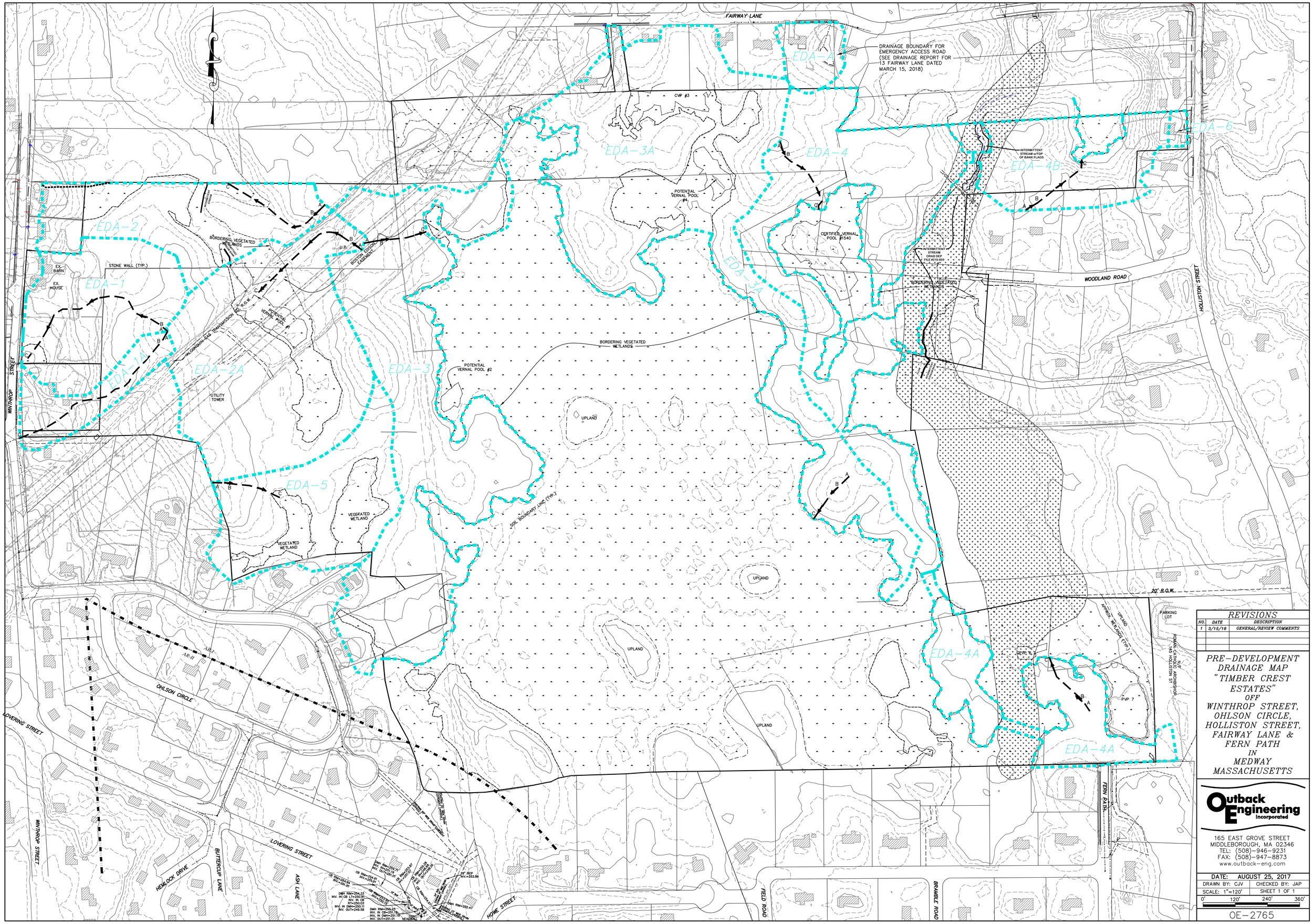
Illicit Discharge Statement (Standard #10)

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 L

Pre- and Post-Development Drainage Maps



REVISIONS

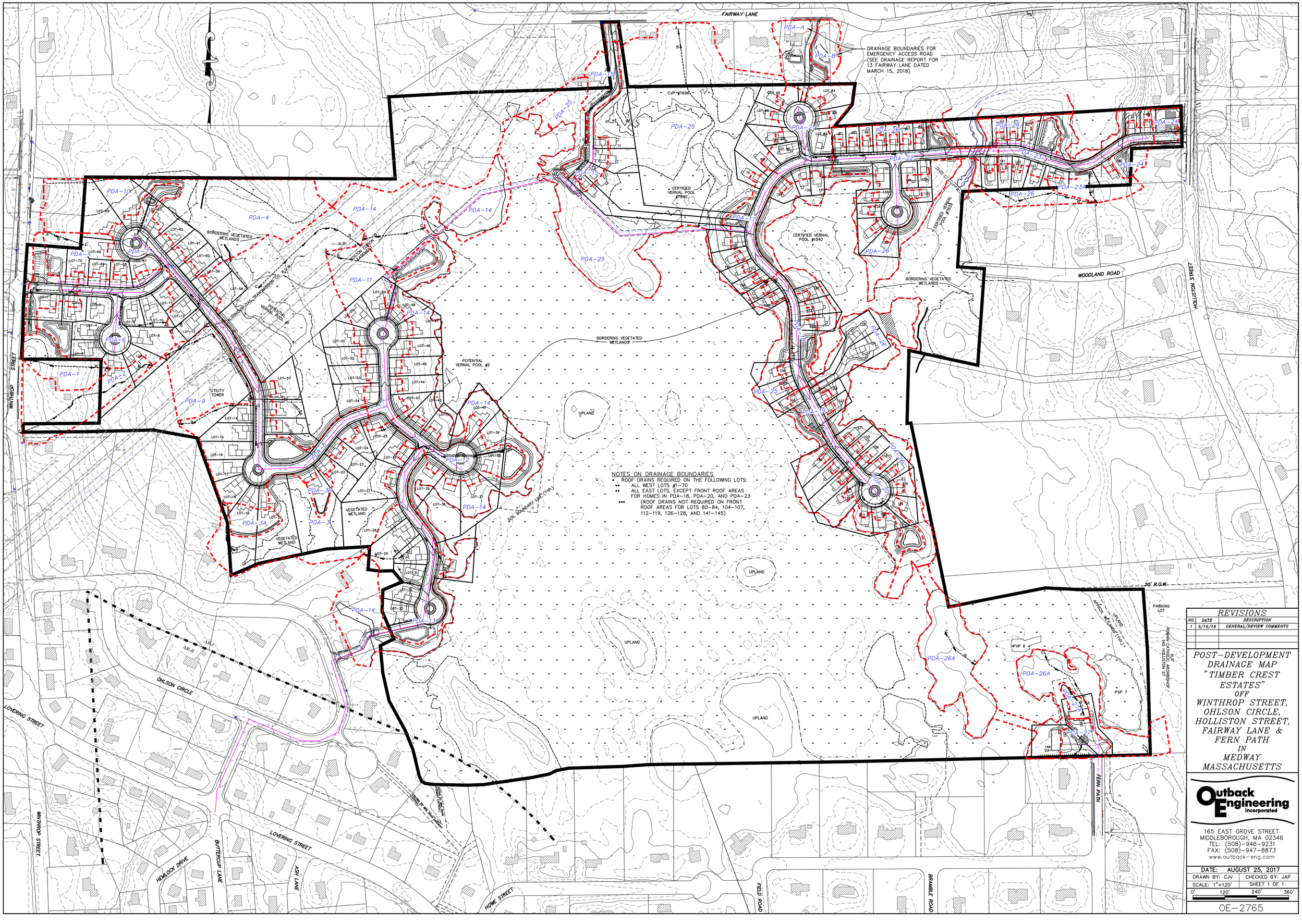
NO.	DATE	DESCRIPTION
1	3/15/18	GENERAL/REVIEW COMMENTS

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



REVISIONS

NO.	DATE	DESCRIPTION
1	3/15/18	GENERAL/REVIEW COMMENTS

POST–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