STORMWATER REPORT

FOR

MALLARD LANE

IN

BOLTON,
MASSACHUSETTS

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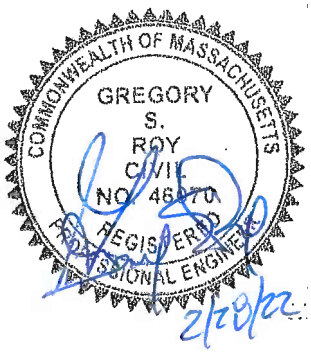

DECEMBER 1ST, 2021
REV. FEBRUARY 28, 2022

DDCDG PROJECT # 5293

DILLIS & ROY CIVIL DESIGN GROUP
CIVIL ENGINEERS LAND SURVEYORS WETLAND CONSULTANTS

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1.0 Project Narrative

1.1 Project Type

The proposed project includes the development of 8 age restricted homes with an associated road and cul-de-sac. The homes will all be connected to a shared septic system and there will be a proposed well on site.

1.2 Purpose and Scope

This report has been prepared to comply with the requirements of the Stormwater Management Standards incorporated in the Massachusetts Wetlands Protection Act Regulations, 310 CMR 10.00. These standards are intended to promote increased groundwater recharge and prevent stormwater discharges from causing or contributing to the pollution of surface waters and ground waters of the Commonwealth. The standards aim to accomplish these goals by encouraging the greater use of low impact development techniques and improving the operation and maintenance of stormwater best management practices.

This report addresses compliance of the proposed development with each of the ten stormwater standards, it provides calculations to support the compliance information, and it provides a Long-Term Pollution Prevention Plan and an Operation and Maintenance Plan for the stormwater management system.

1.3 Proposed Development

As mentioned, the proposed project is an 8 house development with an associated road and cul-de-sac. The project will be filed under a comprehensive permit plan.

The proposed road will have access off the south side of South Bolton Road approximately 670 feet from the intersection with Spectacle Hill Road. All proposed houses will be connected to a shared septic system and will get water from proposed individual wells on site.

1.4 LID Measures

Care has been taken to lay out the proposed site in a manner that works with existing topography. BMPs such as infiltration chambers are used to manage the stormwater runoff. Stormwater from the impervious areas of the proposed lots are routed via storm drains to the infiltration chambers which contains a sediment forebay for pretreatment. The infiltration chambers will be used to promote groundwater recharge and limit the runoff leaving the site

1.5 Site Description

The subject site is found on the south side of South Bolton Road in Bolton

Massachusetts. The site currently vacant and has a gravel driveway that provides access to the property. The site is located on Parcel 002.C-0015.1 and is approximately 5.0 acres. There is one bordering vegetated wetland north of the site across South Bolton Road and one on the abutting property east of the site.

The general topography of the site slopes from south to north/north east towards the offsite wetlands. There are steep slopes along the southern property line. The site is mostly wooded except for the location of the gravel driveway.

The property was previously used as a gravel pit, so the majority of the site consists of gravel material. The NRCS soil survey information indicates that most of the site is underlain with gravel, chatfield-hollis-rock, Hinckley loamy sand and canton fine sandy loam. These soils fall under the Hydrologic Soil Group A, B and D and are delineated on the Pre-Development and Post-Development drainage maps. On site soil testing confirmed the NRCS Soil Survey Data.

Proposed Stormwater Management System

Runoff from the proposed impervious areas will be conveyed and treated through a combination of BMP's and infiltrated to the groundwater. The infiltration will help to recharge the groundwater and ensure that post-development runoff rates will not exceed the pre-development rates. The following is a brief discussion of each conveyance and treatment BMP proposed.

Deep Sump Hooded Catch Basins

Deep sump hooded catch basins are proposed to convey the runoff from the proposed paved areas and roofs to the infiltration basin. These catch basins will discharge to manholes and conventional storm drains.

Infiltration Basin

A infiltration basin is proposed at the of the site. The basin which will be equipped with a sediment forebay, will collect the runoff from the roofs and pavement after pretreatment in the deep sump hooded catch basins. The infiltration basin will recharge the runoff from the 100-year storm which an emergency overflow weir for larger storm events.

Subsurface Infiltration System

Subsurface infiltration systems are included at the entrance of the site and under the cul-de-sac. Cultec prefabricated chambers, models R-180HD and R-902HD, will be installed to collect the runoff from the roofs and pavement after pretreatment in the deep sump hooded catch basins. The infiltration systems will provide groundwater recharge as well.

1.6 Methods of Analysis

United States Department of Agriculture Natural Resources Conservation Service (NRCS) soil cover complex methods (TR-20) were employed to compute runoff quantities for the subject property. HydroCAD 10.10-3a computer software was employed in this hydrologic analysis. A comparison of pre- and post-development runoff quantities at various analysis points downstream around the site was performed in order to design a stormwater management system that will limit peak rates of runoff from the development to predevelopment levels for 24-hour rainfall events of 2-, 10-, 25- and 100-year return frequencies. Watershed boundaries for existing conditions are depicted on the attached Pre-development Watershed Plan. Post-Developed watershed boundaries are indicated on the Post-Development Watershed Plan.

Stormwater runoff drains in two directions off the site: over the northern property line onto South Bolton Road and over the eastern property line into the wetlands on the abutting property. Therefore, two design points were used in the comparison of pre- and post-developed peak runoff rates.

2.0 Stormwater Standards Compliance

2.1 Standard 1 – Untreated Discharges (fully met)

The stormwater management system for the proposed development will not result in any new discharges of untreated stormwater to wetland resource areas. The stormwater management system has been designed such that there is no erosion or scour to wetland resource areas or waters of the Commonwealth.

2.2 Standard 2 – Peak Rate Attenuation (fully met)

The stormwater management system for the proposed development will employ subsurface and conventional infiltration systems that have been sized to retain and recharge the runoff related to a 100-year, 24-hour rainfall event.

Hydrologic calculations for existing and proposed site conditions are included in Appendices D and E respectively. Calculations for 24-hour rainfall events of 2-, 10-, 25- and 100-year return frequencies are provided. The following table provides a summary of peak rates of runoff related to each of these storms for each of the design points. For all rainfall events considered, the proposed stormwater management system will control runoff from the development such that corresponding peak flows at the design point will not exceed pre-development levels.

Table 1: DP-A Peak Runoff Rates

	Pre-Developed	**Post-Develpment**
2-year	0.00 cfs	0.00 cfs
10-year	0.15 cfs	0.02 cfs
25-year	0.42 cfs	0.05 cfs
100-year	1.22 cfs	0.16 cfs

Table 2: DP-B Peak Runoff Rates

	Pre-Developed	**Post-Development**
2-year	0.03 cfs	0.00 cfs
10-year	0.71 cfs	0.67 cfs
25-year	2.00 cfs	1.16 cfs
100-year	4.90 cfs	4.60 cfs

Since the Post-Development peak flow rates are less than the Pre-Development flow rates, we can determine that there will be no increase to off-site flooding during any rainfall event.

2.1 Standard 3 – Recharge (fully met)

As discussed in the Introduction, Natural Resource Conservation Service data indicates that the areas within the proposed development consist of soils from Hydrologic group A, B and D.

The subsurface infiltration systems have been designed to provide the required recharge and water quality volumes. They will provide groundwater recharge across the site which will create optimal conditions for the adjacent wetlands. Recharge calculations can be found in Appendix F.

2.2 Standard 4 – Water Quality (fully met)

A total of 85% TSS removal was achieved using BMPs. As part of the proposed project, infiltration requires a minimum of 44% TSS removal provided prior to discharge. Two TSS calculation sheets have been provided. A calculation sheet showing a deep sump catch basin into a sediment forebay shows proper pre-treatment before entering the infiltration chambers. The isolator row within the infiltration chambers will act as the sediment forebay. The calculation sheet showing a deep sump catch basin into a subsurface infiltration structure shows there is enough TSS removal within the whole system. See Appendix F for detailed calculations.

2.3 Standard 5 – Land Uses with Higher Pollutant Loads (not applicable)

The current and proposed uses of the subject site do not constitute land use with higher potential pollutant load, thus Standard 5 does not apply to the proposed project.

2.4 Standard 6 – Critical Areas (not applicable)

The proposed project does not involve a stormwater discharge within or near to any of the areas defined as “Critical Areas” at 314 CMR 9.02 and 310 CMR 10.04.

2.5 Standard 7 – Redevelopment (not applicable)

The proposed project is not categorized as a redevelopment, therefore Standard 7 does not apply.

2.6 Standard 8 – Construction Period Pollution Prevention and Erosion and Sediment Control (to be submitted at a later date)

The project is subject to the filing of an Environmental Protection Agency Notice of Intent (EPA NOI), therefore, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared prior to construction. This document will be prepared to satisfy

the requirements of the EPA NOI and the Standard 8 Construction Period Pollution prevention and Erosion and Sedimentation Control Plan.

2.7 Standard 9 – Operation and Maintenance Plan (fully met)

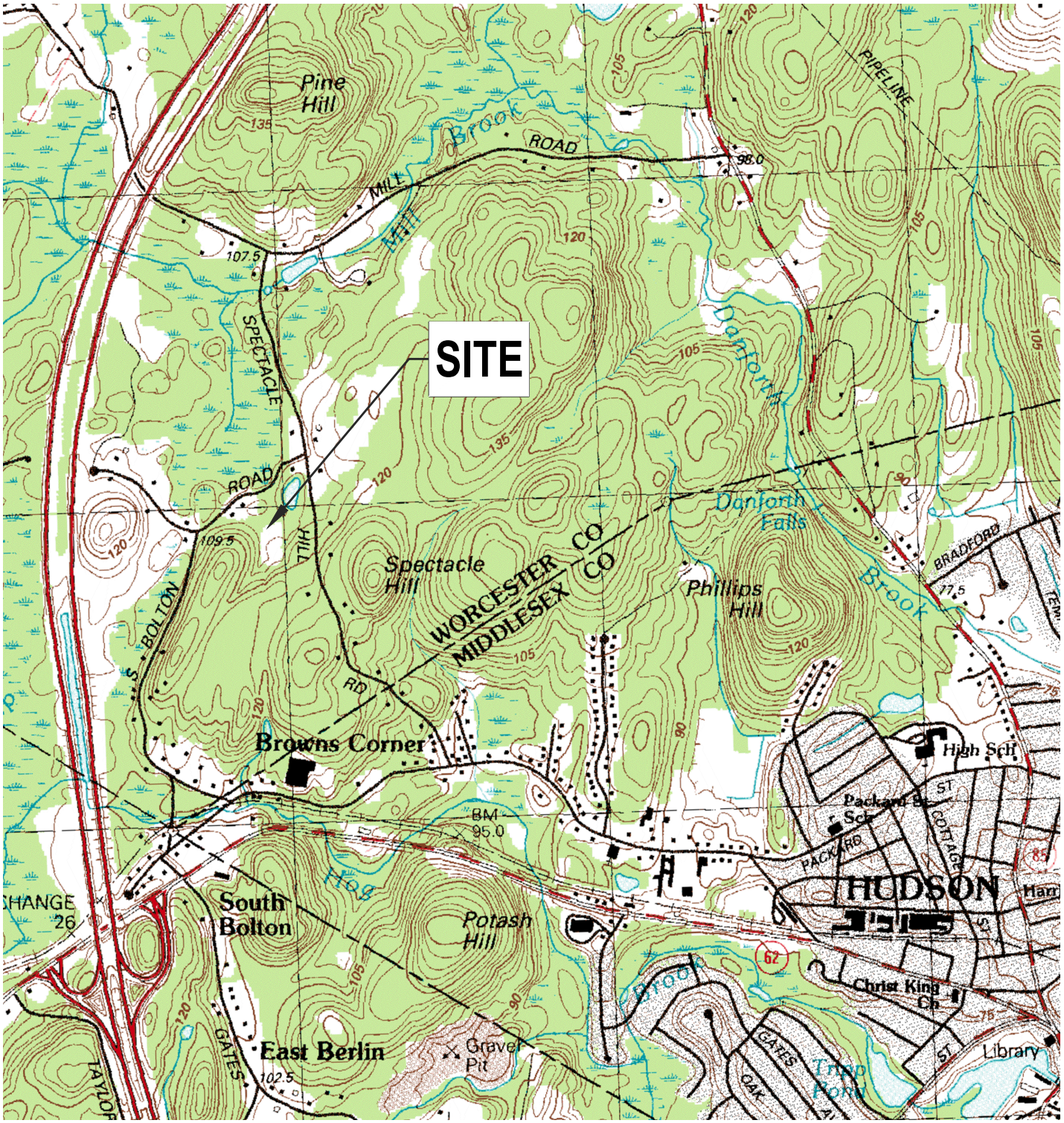
Refer to Appendix H for a complete copy of the Stormwater Operation and Maintenance Plan.

2.8 Standard 10 – Prohibition of Illicit Discharges (to be submitted at a later date)

An illicit discharge statement will be prepared after approvals are received and prior to construction.

APPENDIX A

Locus Map



LOCUS MAP

Prepared By: Dillis & Roy, Civil Design Group, Inc.
1 Main Street, Suite 1
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DATE: FEBRUARY 28, 2022

Prepared For: James Morin
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SCALE: 1" = 800'

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APPENDIX B

Checklist for Stormwater Report

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.

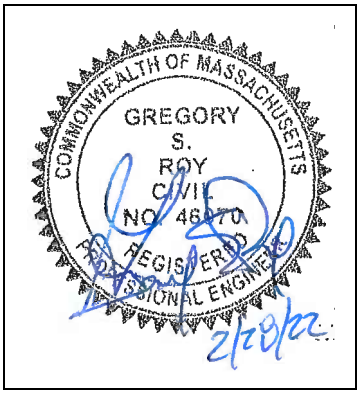
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



Signature and Date

Checklist

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

☑ New development

☐ Redevelopment (Although the project is considered redevelopment, it meets all of the Standards below)

☐ 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:

- [x] 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
- [x] Other (describe): Subsurface Infiltration

Standard 1: No New Untreated Discharges

- [x] No new untreated discharges
- [x] Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- [x] 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

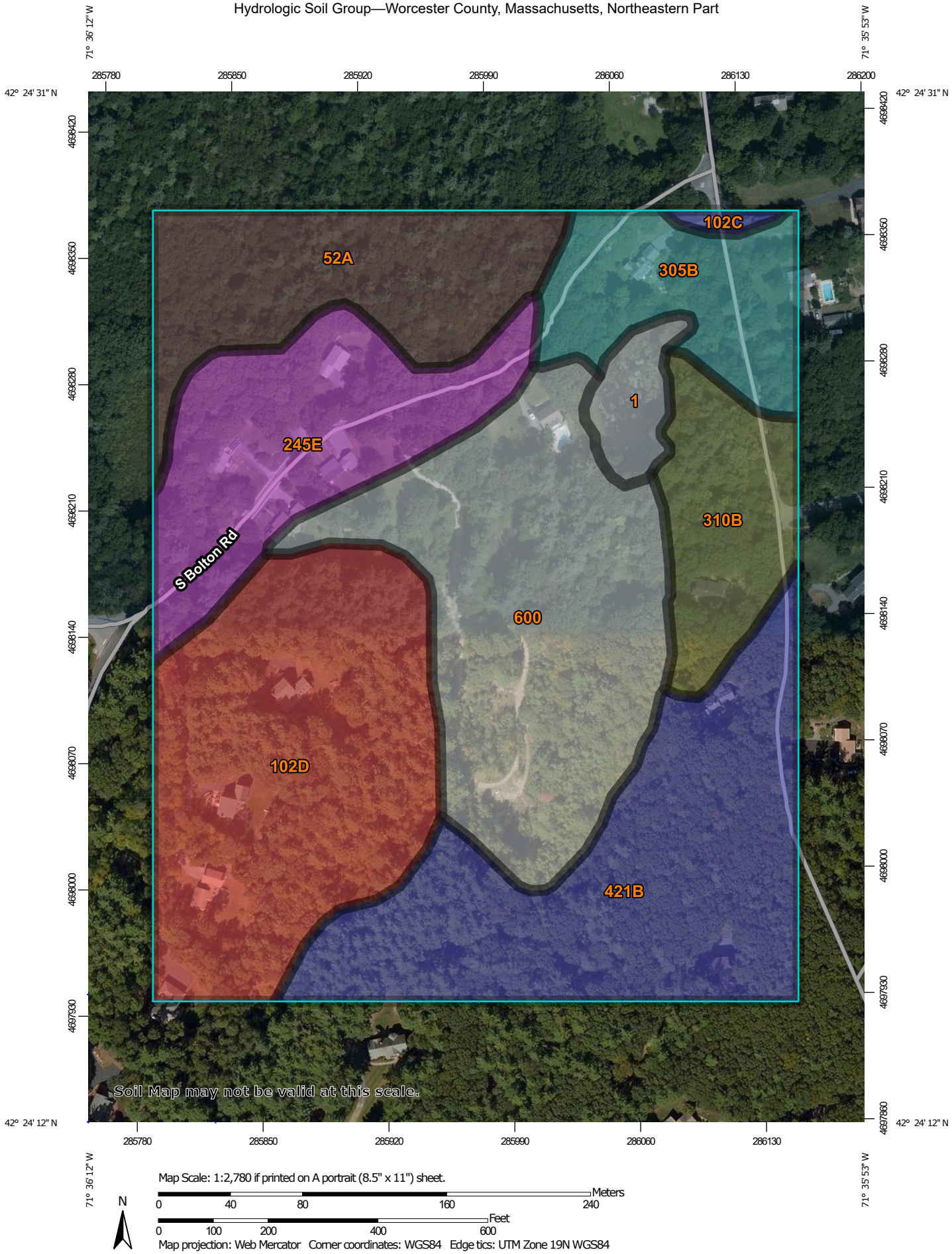
☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ 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

NRCS Soils Data



Map Scale: 1:2,780 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

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 Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

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 1:20,000.

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:
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: Worcester County, Massachusetts, Northeastern Part
Survey Area Data: Version 14, Sep 13, 2019

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

Date(s) aerial images were photographed: Sep 12, 2014—Sep 29, 2019

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		0.8	2.1%
52A	Freetown muck, 0 to 1 percent slopes	B/D	4.2	10.7%
102C	Chatfield-Hollis-Rock outcrop complex, 0 to 15 percent slopes	B	0.2	0.4%
102D	Chatfield-Hollis-Rock outcrop complex, 15 to 35 percent slopes	D	8.1	20.7%
245E	Hinckley loamy sand, 25 to 35 percent slopes	A	4.7	12.1%
305B	Paxton fine sandy loam, 3 to 8 percent slopes	C	2.8	7.3%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	2.6	6.7%
421B	Canton fine sandy loam, 0 to 8 percent slopes, very stony	B	7.7	19.6%
600	Pits, gravel		8.0	20.4%
Totals for Area of Interest			**39.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

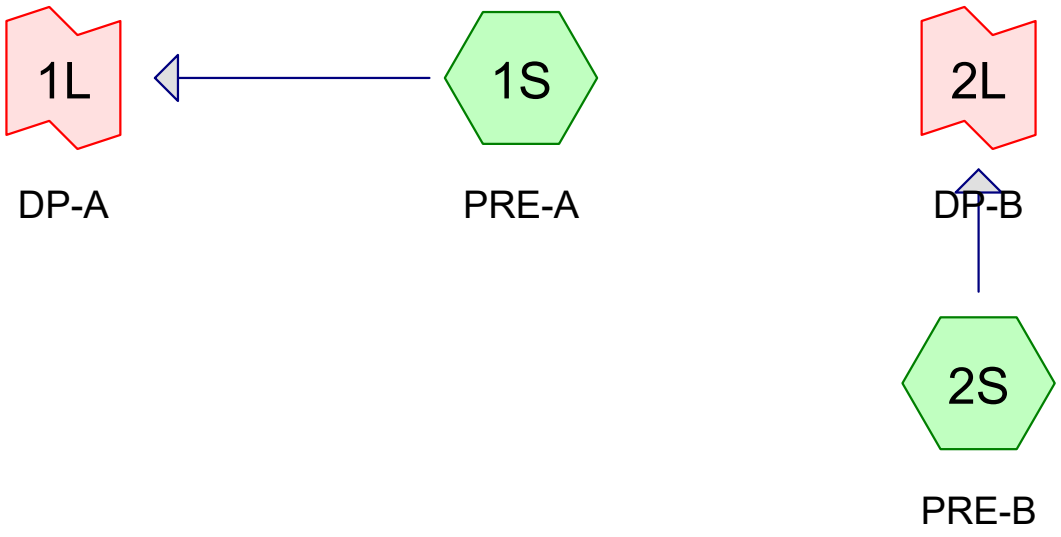
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D

Existing Conditions – Hydrologic Calculations



Subcat Reach Pond Link

Routing Diagram for 5293-PRE
Prepared by Dillis & Roy Civil Design Group, Inc. , Printed 2/28/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.344	39	>75% Grass cover, Good, HSG A (1S)
0.529	96	Gravel surface, HSG A (1S, 2S)
2.854	30	Woods, Good, HSG A (1S, 2S)
0.048	55	Woods, Good, HSG B (2S)
0.549	77	Woods, Good, HSG D (1S, 2S)
4.324	**45**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
3.727	HSG A	1S, 2S
0.048	HSG B	2S
0.000	HSG C	
0.549	HSG D	1S, 2S
0.000	Other	
4.324		**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
0.344	0.000	0.000	0.000	0.000	0.344	>75% Grass cover, Good	1S
0.529	0.000	0.000	0.000	0.000	0.529	Gravel surface	1S, 2S
2.854	0.048	0.000	0.549	0.000	3.452	Woods, Good	1S, 2S
3.727	**0.048**	**0.000**	**0.549**	**0.000**	**4.324**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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: PRE-A Runoff Area=52,347 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=483' Tc=11.8 min CN=43 Runoff=0.00 cfs 0.003 af

Subcatchment2S: PRE-B Runoff Area=136,017 sf 0.00% Impervious Runoff Depth=0.06"
Flow Length=212' Tc=7.1 min CN=46 Runoff=0.03 cfs 0.017 af

Link 1L: DP-A Inflow=0.00 cfs 0.003 af
Primary=0.00 cfs 0.003 af

Link 2L: DP-B Inflow=0.03 cfs 0.017 af
Primary=0.03 cfs 0.017 af

Total Runoff Area = 4.324 ac Runoff Volume = 0.019 af Average Runoff Depth = 0.05"
100.00% Pervious = 4.324 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: PRE-A

Runoff = 0.00 cfs @ 17.05 hrs, Volume= 0.003 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
1,981	96	Gravel surface, HSG A
14,974	39	>75% Grass cover, Good, HSG A
26,864	30	Woods, Good, HSG A
8,528	77	Woods, Good, HSG D
52,347	43	Weighted Average
52,347		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
5.9	433	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.8	483	Total			

Summary for Subcatchment 2S: PRE-B

Runoff = 0.03 cfs @ 14.97 hrs, Volume= 0.017 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
21,041	96	Gravel surface, HSG A
97,477	30	Woods, Good, HSG A
2,108	55	Woods, Good, HSG B
15,391	77	Woods, Good, HSG D
136,017	46	Weighted Average
136,017		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1500	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	162	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	212	Total			

Summary for Link 1L: DP-A

Inflow Area = 1.202 ac, 0.00% Impervious, Inflow Depth = 0.03" for 2-year event
Inflow = 0.00 cfs @ 17.05 hrs, Volume= 0.003 af
Primary = 0.00 cfs @ 17.05 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 3.123 ac, 0.00% Impervious, Inflow Depth = 0.06" for 2-year event
Inflow = 0.03 cfs @ 14.97 hrs, Volume= 0.017 af
Primary = 0.03 cfs @ 14.97 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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: PRE-A Runoff Area=52,347 sf 0.00% Impervious Runoff Depth=0.35"
Flow Length=483' Tc=11.8 min CN=43 Runoff=0.15 cfs 0.035 af

Subcatchment2S: PRE-B Runoff Area=136,017 sf 0.00% Impervious Runoff Depth=0.48"
Flow Length=212' Tc=7.1 min CN=46 Runoff=0.71 cfs 0.125 af

Link 1L: DP-A Inflow=0.15 cfs 0.035 af
Primary=0.15 cfs 0.035 af

Link 2L: DP-B Inflow=0.71 cfs 0.125 af
Primary=0.71 cfs 0.125 af

Total Runoff Area = 4.324 ac Runoff Volume = 0.160 af Average Runoff Depth = 0.44"
100.00% Pervious = 4.324 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: PRE-A

Runoff = 0.15 cfs @ 12.45 hrs, Volume= 0.035 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
1,981	96	Gravel surface, HSG A
14,974	39	>75% Grass cover, Good, HSG A
26,864	30	Woods, Good, HSG A
8,528	77	Woods, Good, HSG D
52,347	43	Weighted Average
52,347		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
5.9	433	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.8	483	Total			

Summary for Subcatchment 2S: PRE-B

Runoff = 0.71 cfs @ 12.29 hrs, Volume= 0.125 af, Depth= 0.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
21,041	96	Gravel surface, HSG A
97,477	30	Woods, Good, HSG A
2,108	55	Woods, Good, HSG B
15,391	77	Woods, Good, HSG D
136,017	46	Weighted Average
136,017		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1500	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	162	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	212	Total			

Summary for Link 1L: DP-A

Inflow Area = 1.202 ac, 0.00% Impervious, Inflow Depth = 0.35" for 10-year event
Inflow = 0.15 cfs @ 12.45 hrs, Volume= 0.035 af
Primary = 0.15 cfs @ 12.45 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 3.123 ac, 0.00% Impervious, Inflow Depth = 0.48" for 10-year event
Inflow = 0.71 cfs @ 12.29 hrs, Volume= 0.125 af
Primary = 0.71 cfs @ 12.29 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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: PRE-A Runoff Area=52,347 sf 0.00% Impervious Runoff Depth=0.69"
Flow Length=483' Tc=11.8 min CN=43 Runoff=0.42 cfs 0.069 af

Subcatchment2S: PRE-B Runoff Area=136,017 sf 0.00% Impervious Runoff Depth=0.89"
Flow Length=212' Tc=7.1 min CN=46 Runoff=2.00 cfs 0.231 af

Link 1L: DP-A Inflow=0.42 cfs 0.069 af
Primary=0.42 cfs 0.069 af

Link 2L: DP-B Inflow=2.00 cfs 0.231 af
Primary=2.00 cfs 0.231 af

Total Runoff Area = 4.324 ac Runoff Volume = 0.300 af Average Runoff Depth = 0.83"
100.00% Pervious = 4.324 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: PRE-A

Runoff = 0.42 cfs @ 12.30 hrs, Volume= 0.069 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
1,981	96	Gravel surface, HSG A
14,974	39	>75% Grass cover, Good, HSG A
26,864	30	Woods, Good, HSG A
8,528	77	Woods, Good, HSG D
52,347	43	Weighted Average
52,347		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
5.9	433	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.8	483	Total			

Summary for Subcatchment 2S: PRE-B

Runoff = 2.00 cfs @ 12.15 hrs, Volume= 0.231 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
21,041	96	Gravel surface, HSG A
97,477	30	Woods, Good, HSG A
2,108	55	Woods, Good, HSG B
15,391	77	Woods, Good, HSG D
136,017	46	Weighted Average
136,017		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1500	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	162	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	212	Total			

Summary for Link 1L: DP-A

Inflow Area = 1.202 ac, 0.00% Impervious, Inflow Depth = 0.69" for 25-year event
Inflow = 0.42 cfs @ 12.30 hrs, Volume= 0.069 af
Primary = 0.42 cfs @ 12.30 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 3.123 ac, 0.00% Impervious, Inflow Depth = 0.89" for 25-year event
Inflow = 2.00 cfs @ 12.15 hrs, Volume= 0.231 af
Primary = 2.00 cfs @ 12.15 hrs, Volume= 0.231 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 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: PRE-A Runoff Area=52,347 sf 0.00% Impervious Runoff Depth=1.40"
Flow Length=483' Tc=11.8 min CN=43 Runoff=1.22 cfs 0.140 af

Subcatchment2S: PRE-B Runoff Area=136,017 sf 0.00% Impervious Runoff Depth=1.68"
Flow Length=212' Tc=7.1 min CN=46 Runoff=4.90 cfs 0.437 af

Link 1L: DP-A Inflow=1.22 cfs 0.140 af
Primary=1.22 cfs 0.140 af

Link 2L: DP-B Inflow=4.90 cfs 0.437 af
Primary=4.90 cfs 0.437 af

Total Runoff Area = 4.324 ac Runoff Volume = 0.577 af Average Runoff Depth = 1.60"
100.00% Pervious = 4.324 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: PRE-A

Runoff = 1.22 cfs @ 12.21 hrs, Volume= 0.140 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
1,981	96	Gravel surface, HSG A
14,974	39	>75% Grass cover, Good, HSG A
26,864	30	Woods, Good, HSG A
8,528	77	Woods, Good, HSG D
52,347	43	Weighted Average
52,347		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.1300	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
5.9	433	0.0600	1.22		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
11.8	483	Total			

Summary for Subcatchment 2S: PRE-B

Runoff = 4.90 cfs @ 12.12 hrs, Volume= 0.437 af, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
21,041	96	Gravel surface, HSG A
97,477	30	Woods, Good, HSG A
2,108	55	Woods, Good, HSG B
15,391	77	Woods, Good, HSG D
136,017	46	Weighted Average
136,017		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.1500	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
1.5	162	0.1300	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
7.1	212	Total			

Summary for Link 1L: DP-A

Inflow Area = 1.202 ac, 0.00% Impervious, Inflow Depth = 1.40" for 100-year event
Inflow = 1.22 cfs @ 12.21 hrs, Volume= 0.140 af
Primary = 1.22 cfs @ 12.21 hrs, Volume= 0.140 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

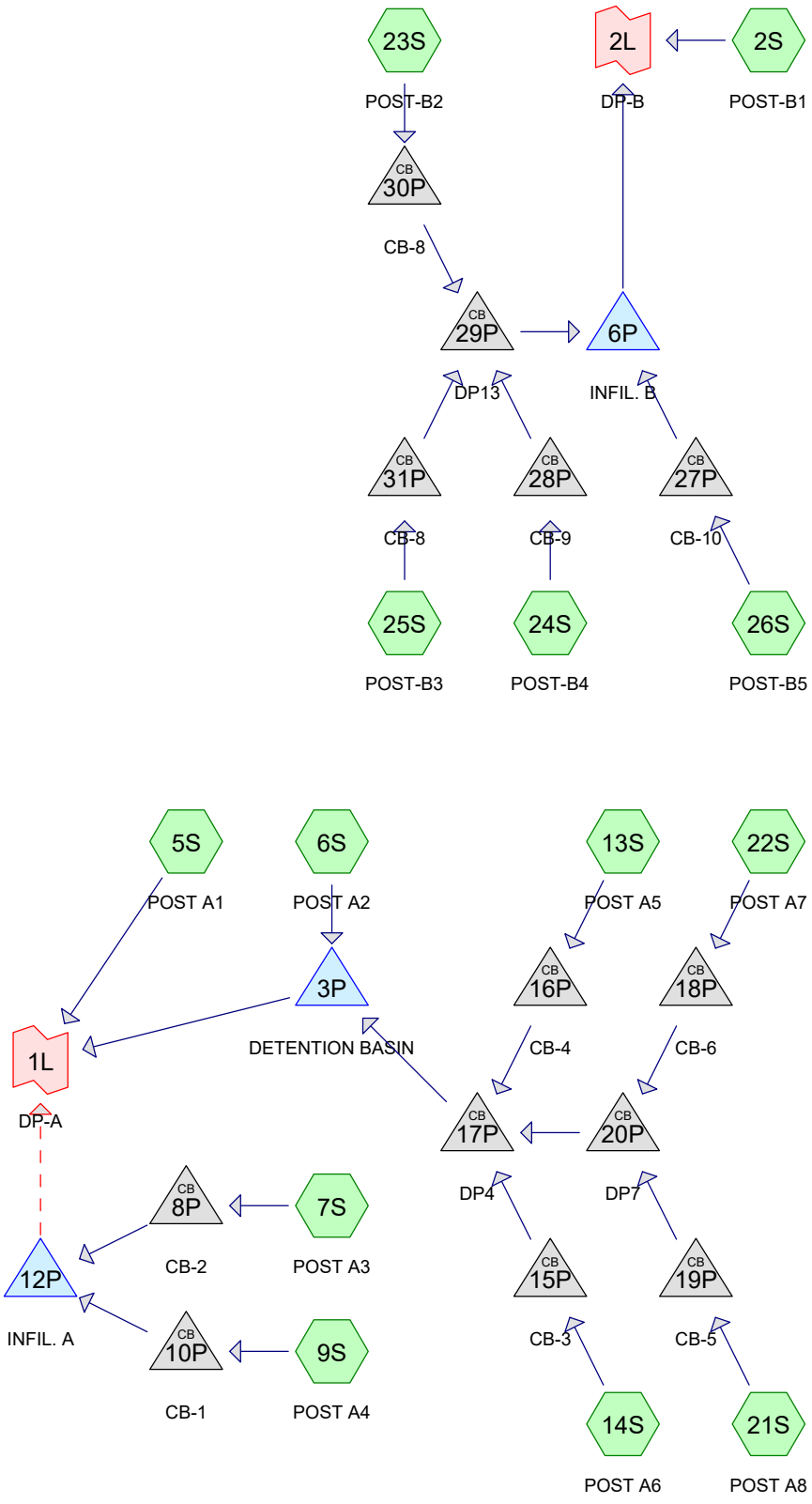
Summary for Link 2L: DP-B

Inflow Area = 3.123 ac, 0.00% Impervious, Inflow Depth = 1.68" for 100-year event
Inflow = 4.90 cfs @ 12.12 hrs, Volume= 0.437 af
Primary = 4.90 cfs @ 12.12 hrs, Volume= 0.437 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

APPENDIX E

Proposed Conditions – Hydrologic Calculations



Routing Diagram for 5293-POST

Prepared by Dillis & Roy Civil Design Group, Inc. , Printed 2/28/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.136	39	>75% Grass cover, Good, HSG A (2S, 5S, 6S, 7S, 9S, 13S, 14S, 21S, 22S, 23S, 24S, 25S, 26S)
0.325	80	>75% Grass cover, Good, HSG D (14S, 21S, 24S, 25S, 26S)
0.659	98	Paved parking, HSG A (5S, 7S, 9S, 13S, 14S, 21S, 22S, 23S, 25S, 26S)
0.415	98	Roofs, HSG A (2S, 23S, 24S, 25S, 26S)
0.075	98	Unconnected roofs, HSG A (6S, 13S, 21S)
0.030	98	Unconnected roofs, HSG D (21S)
0.456	30	Woods, Good, HSG A (2S, 5S, 6S, 14S, 23S, 24S, 25S, 26S)
0.226	77	Woods, Good, HSG D (14S, 24S, 25S, 26S)
4.323	**59**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
3.742	HSG A	2S, 5S, 6S, 7S, 9S, 13S, 14S, 21S, 22S, 23S, 24S, 25S, 26S
0.000	HSG B	
0.000	HSG C	
0.582	HSG D	14S, 21S, 24S, 25S, 26S
0.000	Other	
4.323		**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
2.136	0.000	0.000	0.325	0.000	2.462	>75% Grass cover, Good	2S, 5S, 6S, 7S, 9S, 13S, 14S, 21S, 22S, 23S, 24S, 25S, 26S
0.659	0.000	0.000	0.000	0.000	0.659	Paved parking	5S, 7S, 9S, 13S, 14S, 21S, 22S, 23S, 25S, 26S
0.415	0.000	0.000	0.000	0.000	0.415	Roofs	2S, 23S, 24S, 25S, 26S
0.075	0.000	0.000	0.030	0.000	0.104	Unconnected roofs	6S, 13S, 21S
0.456	0.000	0.000	0.226	0.000	0.682	Woods, Good	2S, 5S, 6S, 14S, 23S, 24S, 25S, 26S
3.742	**0.000**	**0.000**	**0.582**	**0.000**	**4.323**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	6P	356.00	355.00	139.0	0.0072	0.013	12.0	0.0	0.0
2	8P	344.04	343.77	27.0	0.0100	0.012	12.0	0.0	0.0
3	10P	344.04	343.77	8.0	0.0338	0.012	12.0	0.0	0.0
4	12P	346.00	345.00	20.0	0.0500	0.130	12.0	0.0	0.0
5	15P	348.09	347.79	15.0	0.0200	0.012	12.0	0.0	0.0
6	16P	348.09	347.79	15.0	0.0200	0.012	12.0	0.0	0.0
7	17P	347.69	347.26	43.0	0.0100	0.012	15.0	0.0	0.0
8	18P	356.89	356.59	15.0	0.0200	0.012	12.0	0.0	0.0
9	19P	356.89	356.59	15.0	0.0200	0.012	12.0	0.0	0.0
10	20P	356.49	347.79	159.0	0.0547	0.012	12.0	0.0	0.0
11	27P	361.96	359.29	89.0	0.0300	0.012	12.0	0.0	0.0
12	28P	360.34	360.03	31.0	0.0100	0.012	12.0	0.0	0.0
13	29P	359.93	359.29	64.0	0.0100	0.012	18.0	0.0	0.0
14	30P	360.33	360.03	30.0	0.0100	0.012	12.0	0.0	0.0
15	31P	360.33	360.03	30.0	0.0100	0.012	12.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: POST-B1 Runoff Area=35,830 sf 9.91% Impervious Runoff Depth=0.02"
Tc=6.0 min CN=42 Runoff=0.00 cfs 0.001 af

Subcatchment5S: POST A1 Runoff Area=6,376 sf 6.09% Impervious Runoff Depth=0.02"
Tc=6.0 min CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment6S: POST A2 Runoff Area=14,477 sf 13.39% Impervious Runoff Depth=0.02"
Tc=6.0 min UI Adjusted CN=42 Runoff=0.00 cfs 0.000 af

Subcatchment7S: POST A3 Runoff Area=1,656 sf 64.49% Impervious Runoff Depth=1.25"
Tc=6.0 min CN=77 Runoff=0.05 cfs 0.004 af

Subcatchment9S: POST A4 Runoff Area=7,665 sf 21.20% Impervious Runoff Depth=0.19"
Tc=6.0 min CN=52 Runoff=0.01 cfs 0.003 af

Subcatchment13S: POST A5 Runoff Area=5,473 sf 51.69% Impervious Runoff Depth=0.81"
Tc=6.0 min CN=69 Runoff=0.10 cfs 0.008 af

Subcatchment14S: POST A6 Runoff Area=23,604 sf 10.20% Impervious Runoff Depth=0.27"
Tc=6.0 min CN=55 Runoff=0.06 cfs 0.012 af

Subcatchment21S: POST A8 Runoff Area=11,091 sf 51.42% Impervious Runoff Depth=1.72"
Tc=6.0 min CN=84 Runoff=0.50 cfs 0.037 af

Subcatchment22S: POST A7 Runoff Area=3,287 sf 69.15% Impervious Runoff Depth=1.44"
Tc=6.0 min CN=80 Runoff=0.12 cfs 0.009 af

Subcatchment23S: POST-B2 Runoff Area=23,538 sf 56.59% Impervious Runoff Depth=0.96"
Tc=6.0 min CN=72 Runoff=0.56 cfs 0.043 af

Subcatchment24S: POST-B4 Runoff Area=8,332 sf 7.80% Impervious Runoff Depth=0.91"
Tc=6.0 min CN=71 Runoff=0.18 cfs 0.014 af

Subcatchment25S: POST-B3 Runoff Area=17,344 sf 47.42% Impervious Runoff Depth=1.19"
Tc=6.0 min CN=76 Runoff=0.53 cfs 0.039 af

Subcatchment26S: POST-B5 Runoff Area=29,650 sf 24.93% Impervious Runoff Depth=0.33"
Tc=6.0 min CN=57 Runoff=0.11 cfs 0.019 af

Pond 3P: DETENTION BASIN Peak Elev=346.10' Storage=223 cf Inflow=0.75 cfs 0.067 af
Discarded=0.44 cfs 0.067 af Primary=0.00 cfs 0.000 af Outflow=0.44 cfs 0.067 af

Pond 6P: INFIL. B Peak Elev=356.37' Storage=0.022 af Inflow=1.35 cfs 0.116 af
Discarded=0.42 cfs 0.116 af Primary=0.00 cfs 0.000 af Outflow=0.42 cfs 0.116 af

Pond 8P: CB-2 Peak Elev=344.16' Inflow=0.05 cfs 0.004 af
12.0" Round Culvert n=0.012 L=27.0' S=0.0100 '/' Outflow=0.05 cfs 0.004 af

Pond 10P: CB-1 Peak Elev=344.09' Inflow=0.01 cfs 0.003 af
12.0" Round Culvert n=0.012 L=8.0' S=0.0338 '/' Outflow=0.01 cfs 0.003 af

Pond 12P: INFIL. A Peak Elev=343.29' Storage=0.000 af Inflow=0.05 cfs 0.007 af
Discarded=0.05 cfs 0.007 af Secondary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.007 af

Pond 15P: CB-3 Peak Elev=348.22' Inflow=0.06 cfs 0.012 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.06 cfs 0.012 af

Pond 16P: CB-4 Peak Elev=348.26' Inflow=0.10 cfs 0.008 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.10 cfs 0.008 af

Pond 17P: DP4 Peak Elev=348.15' Inflow=0.75 cfs 0.066 af
15.0" Round Culvert n=0.012 L=43.0' S=0.0100 '/' Outflow=0.75 cfs 0.066 af

Pond 18P: CB-6 Peak Elev=357.08' Inflow=0.12 cfs 0.009 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.12 cfs 0.009 af

Pond 19P: CB-5 Peak Elev=357.29' Inflow=0.50 cfs 0.037 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.50 cfs 0.037 af

Pond 20P: DP7 Peak Elev=356.94' Inflow=0.63 cfs 0.046 af
12.0" Round Culvert n=0.012 L=159.0' S=0.0547 '/' Outflow=0.63 cfs 0.046 af

Pond 27P: CB-10 Peak Elev=362.14' Inflow=0.11 cfs 0.019 af
12.0" Round Culvert n=0.012 L=89.0' S=0.0300 '/' Outflow=0.11 cfs 0.019 af

Pond 28P: CB-9 Peak Elev=360.58' Inflow=0.18 cfs 0.014 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=0.18 cfs 0.014 af

Pond 29P: DP13 Peak Elev=360.50' Inflow=1.27 cfs 0.097 af
18.0" Round Culvert n=0.012 L=64.0' S=0.0100 '/' Outflow=1.27 cfs 0.097 af

Pond 30P: CB-8 Peak Elev=360.75' Inflow=0.56 cfs 0.043 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=0.56 cfs 0.043 af

Pond 31P: CB-8 Peak Elev=360.74' Inflow=0.53 cfs 0.039 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Link 1L: DP-A Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 2L: DP-B Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Total Runoff Area = 4.323 ac Runoff Volume = 0.190 af Average Runoff Depth = 0.53"
72.72% Pervious = 3.144 ac 27.28% Impervious = 1.179 ac

Summary for Subcatchment 2S: POST-B1

Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.001 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
3,550	98	Roofs, HSG A
22,530	39	>75% Grass cover, Good, HSG A
9,750	30	Woods, Good, HSG A
35,830	42	Weighted Average
32,280		90.09% Pervious Area
3,550		9.91% Impervious Area

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

Summary for Subcatchment 5S: POST A1

Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
5,531	39	>75% Grass cover, Good, HSG A
457	30	Woods, Good, HSG A
388	98	Paved parking, HSG A
6,376	42	Weighted Average
5,988		93.91% Pervious Area
388		6.09% Impervious Area

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

Summary for Subcatchment 6S: POST A2

Runoff = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Adj	Description
11,475	39		>75% Grass cover, Good, HSG A
1,064	30		Woods, Good, HSG A
1,938	98		Unconnected roofs, HSG A
14,477	46	42	Weighted Average, UI Adjusted
12,539			86.61% Pervious Area
1,938			13.39% Impervious Area
1,938			100.00% Unconnected

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

Summary for Subcatchment 7S: POST A3

Runoff = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
588	39	>75% Grass cover, Good, HSG A
1,068	98	Paved parking, HSG A
1,656	77	Weighted Average
588		35.51% Pervious Area
1,068		64.49% Impervious Area

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

Summary for Subcatchment 9S: POST A4

Runoff = 0.01 cfs @ 12.40 hrs, Volume= 0.003 af, Depth= 0.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
6,040	39	>75% Grass cover, Good, HSG A
1,625	98	Paved parking, HSG A
7,665	52	Weighted Average
6,040		78.80% Pervious Area
1,625		21.20% Impervious Area

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

Summary for Subcatchment 13S: POST A5

Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.008 af, Depth= 0.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
2,644	39	>75% Grass cover, Good, HSG A
2,168	98	Paved parking, HSG A
661	98	Unconnected roofs, HSG A
5,473	69	Weighted Average
2,644		48.31% Pervious Area
2,829		51.69% Impervious Area
661		23.37% Unconnected

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

Summary for Subcatchment 14S: POST A6

Runoff = 0.06 cfs @ 12.32 hrs, Volume= 0.012 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
2,408	98	Paved parking, HSG A
9,904	39	>75% Grass cover, Good, HSG A
920	80	>75% Grass cover, Good, HSG D
4,110	30	Woods, Good, HSG A
6,262	77	Woods, Good, HSG D
23,604	55	Weighted Average
21,196		89.80% Pervious Area
2,408		10.20% Impervious Area

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

Summary for Subcatchment 21S: POST A8

Runoff = 0.50 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
1,428	39	>75% Grass cover, Good, HSG A
3,960	80	>75% Grass cover, Good, HSG D
3,753	98	Paved parking, HSG A
656	98	Unconnected roofs, HSG A
1,294	98	Unconnected roofs, HSG D
11,091	84	Weighted Average
5,388		48.58% Pervious Area
5,703		51.42% Impervious Area
1,950		34.19% Unconnected

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

Summary for Subcatchment 22S: POST A7

Runoff = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
1,014	39	>75% Grass cover, Good, HSG A
2,273	98	Paved parking, HSG A
3,287	80	Weighted Average
1,014		30.85% Pervious Area
2,273		69.15% Impervious Area

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

Summary for Subcatchment 23S: POST-B2

Runoff = 0.56 cfs @ 12.10 hrs, Volume= 0.043 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
9,971	39	>75% Grass cover, Good, HSG A
247	30	Woods, Good, HSG A
6,536	98	Paved parking, HSG A
6,784	98	Roofs, HSG A
23,538	72	Weighted Average
10,218		43.41% Pervious Area
13,320		56.59% Impervious Area

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

Summary for Subcatchment 24S: POST-B4

Runoff = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
1,793	39	>75% Grass cover, Good, HSG A
4,921	80	>75% Grass cover, Good, HSG D
138	30	Woods, Good, HSG A
830	77	Woods, Good, HSG D
650	98	Roofs, HSG A
8,332	71	Weighted Average
7,682		92.20% Pervious Area
650		7.80% Impervious Area

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

Summary for Subcatchment 25S: POST-B3

Runoff = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
5,059	39	>75% Grass cover, Good, HSG A
3,462	80	>75% Grass cover, Good, HSG D
177	30	Woods, Good, HSG A
422	77	Woods, Good, HSG D
6,064	98	Paved parking, HSG A
2,160	98	Roofs, HSG A
17,344	76	Weighted Average
9,120		52.58% Pervious Area
8,224		47.42% Impervious Area

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

Summary for Subcatchment 26S: POST-B5

Runoff = 0.11 cfs @ 12.15 hrs, Volume= 0.019 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.25"

Area (sf)	CN	Description
15,074	39	>75% Grass cover, Good, HSG A
915	80	>75% Grass cover, Good, HSG D
3,920	30	Woods, Good, HSG A
2,348	77	Woods, Good, HSG D
2,439	98	Paved parking, HSG A
4,954	98	Roofs, HSG A
29,650	57	Weighted Average
22,257		75.07% Pervious Area
7,393		24.93% Impervious Area

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

Summary for Pond 3P: DETENTION BASIN

Inflow Area = 1.330 ac, 26.15% Impervious, Inflow Depth = 0.60" for 2-year event
Inflow = 0.75 cfs @ 12.10 hrs, Volume= 0.067 af
Outflow = 0.44 cfs @ 12.26 hrs, Volume= 0.067 af, Atten= 42%, Lag= 9.6 min
Discarded = 0.44 cfs @ 12.26 hrs, Volume= 0.067 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 346.10' @ 12.26 hrs Surf.Area= 2,229 sf Storage= 223 cf

Plug-Flow detention time= 4.4 min calculated for 0.067 af (100% of inflow)
Center-of-Mass det. time= 4.4 min (866.0 - 861.7)

Volume	Invert	Avail.Storage	Storage Description
#1	346.00'	14,542 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)
346.00	2,163	220.0	0	0	2,163
347.00	2,853	239.0	2,500	2,500	2,894
348.00	3,600	258.0	3,219	5,719	3,685
349.00	4,404	277.0	3,995	9,715	4,537
350.00	5,264	296.0	4,828	14,542	5,450

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 343.00'
#2	Primary	349.00'	**20.0' long x 16.0' 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=0.44 cfs @ 12.26 hrs HW=346.10' (Free Discharge)
↑**1=Exfiltration** (Controls 0.44 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=346.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: INFIL. B

Inflow Area = 1.810 ac, 37.52% Impervious, Inflow Depth = 0.77" for 2-year event
Inflow = 1.35 cfs @ 12.11 hrs, Volume= 0.116 af
Outflow = 0.42 cfs @ 12.51 hrs, Volume= 0.116 af, Atten= 69%, Lag= 24.5 min
Discarded = 0.42 cfs @ 12.51 hrs, Volume= 0.116 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 356.37' @ 12.51 hrs Surf.Area= 0.039 ac Storage= 0.022 af
Flood Elev= 364.70' Surf.Area= 0.039 ac Storage= 0.152 af

Plug-Flow detention time= 14.2 min calculated for 0.116 af (100% of inflow)
Center-of-Mass det. time= 14.2 min (889.0 - 874.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	355.00'	0.069 af	**39.50'W x 43.37'L x 6.50'H Field A** 0.256 af Overall - 0.082 af Embedded = 0.173 af x 40.0% Voids
#2A	356.50'	0.082 af	**Cultec R-902HD** x 55 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 55 Chambers in 5 Rows Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
		0.152 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	355.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 350.00'
#2	Device 4	360.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	357.00'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	356.00'	**12.0" Round Culvert** L= 139.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.00' / 355.00' S= 0.0072 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Discarded OutFlow Max=0.42 cfs @ 12.51 hrs HW=356.37' (Free Discharge)
└**1=Exfiltration** (Controls 0.42 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=355.00' (Free Discharge)
└**4=Culvert** (Controls 0.00 cfs)
  ├**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 6P: INFIL. B - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

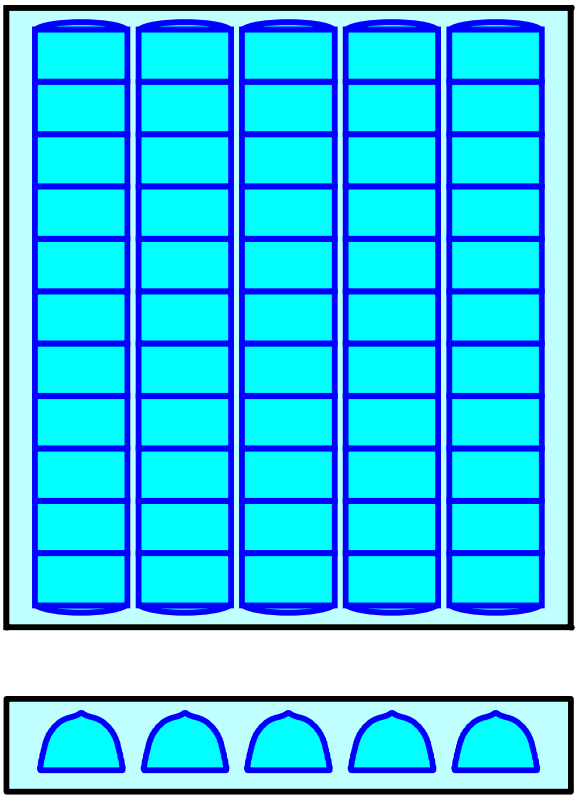
11 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 41.37' Row Length +12.0" End Stone x 2 = 43.37' Base Length
5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 24.0" Side Stone x 2 = 39.50' Base Width
18.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 6.50' Field Height

55 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 5 Rows = 3,588.0 cf Chamber Storage

11,134.4 cf Field - 3,588.0 cf Chambers = 7,546.4 cf Stone x 40.0% Voids = 3,018.5 cf Stone Storage

Chamber Storage + Stone Storage = 6,606.6 cf = 0.152 af
Overall Storage Efficiency = 59.3%
Overall System Size = 43.37' x 39.50' x 6.50'

55 Chambers
412.4 cy Field
279.5 cy Stone



Summary for Pond 8P: CB-2

Inflow Area = 0.038 ac, 64.49% Impervious, Inflow Depth = 1.25" for 2-year event
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af
Outflow = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min
Primary = 0.05 cfs @ 12.10 hrs, Volume= 0.004 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.16' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.05 cfs @ 12.10 hrs HW=344.16' (Free Discharge)
1=Culvert (Inlet Controls 0.05 cfs @ 0.95 fps)

Summary for Pond 10P: CB-1

Inflow Area = 0.176 ac, 21.20% Impervious, Inflow Depth = 0.19" for 2-year event
Inflow = 0.01 cfs @ 12.40 hrs, Volume= 0.003 af
Outflow = 0.01 cfs @ 12.40 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
Primary = 0.01 cfs @ 12.40 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.09' @ 12.40 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0338 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.01 cfs @ 12.40 hrs HW=344.09' (Free Discharge)
1=Culvert (Inlet Controls 0.01 cfs @ 0.62 fps)

Summary for Pond 12P: INFIL. A

Inflow Area = 0.214 ac, 28.89% Impervious, Inflow Depth = 0.37" for 2-year event
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 0.007 af
Outflow = 0.05 cfs @ 12.12 hrs, Volume= 0.007 af, Atten= 5%, Lag= 1.2 min
Discarded = 0.05 cfs @ 12.12 hrs, Volume= 0.007 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 343.29' @ 12.12 hrs Surf.Area= 0.009 ac Storage= 0.000 af

Plug-Flow detention time= 1.3 min calculated for 0.007 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (905.3 - 904.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	343.27'	0.007 af	**11.50'W x 34.65'L x 2.71'H Field A** 0.025 af Overall - 0.008 af Embedded = 0.017 af x 40.0% Voids
#2A	343.77'	0.008 af	**Cultec R-180** x 15 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 3 rows
		0.015 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	343.27'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 340.00'
#2	Secondary	346.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.00' S= 0.0500 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Discarded OutFlow Max=0.08 cfs @ 12.12 hrs HW=343.29' (Free Discharge)
↑**1=Exfiltration** (Controls 0.08 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=343.27' (Free Discharge)
↑**2=Culvert** (Controls 0.00 cfs)

Pond 12P: INFIL. A - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger® 180HD)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 3 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

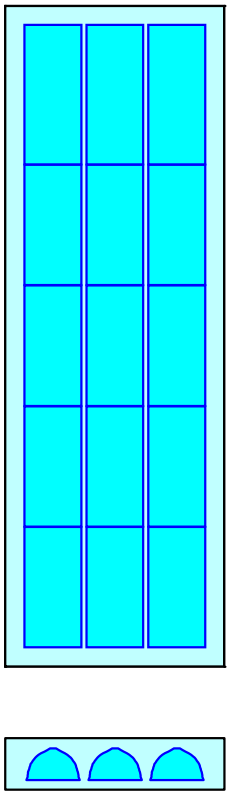
5 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 32.65' Row Length +12.0" End Stone x 2 = 34.65' Base Length
3 Rows x 36.0" Wide + 3.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.50' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

15 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 3 Rows = 336.9 cf Chamber Storage

1,079.2 cf Field - 336.9 cf Chambers = 742.3 cf Stone x 40.0% Voids = 296.9 cf Stone Storage

Chamber Storage + Stone Storage = 633.8 cf = 0.015 af
Overall Storage Efficiency = 58.7%
Overall System Size = 34.65' x 11.50' x 2.71'

15 Chambers
40.0 cy Field
27.5 cy Stone



Summary for Pond 15P: CB-3

Inflow Area = 0.542 ac, 10.20% Impervious, Inflow Depth = 0.27" for 2-year event
Inflow = 0.06 cfs @ 12.32 hrs, Volume= 0.012 af
Outflow = 0.06 cfs @ 12.32 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.06 cfs @ 12.32 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.22' @ 12.32 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.06 cfs @ 12.32 hrs HW=348.22' (Free Discharge)
1=Culvert (Inlet Controls 0.06 cfs @ 0.98 fps)

Summary for Pond 16P: CB-4

Inflow Area = 0.126 ac, 51.69% Impervious, Inflow Depth = 0.81" for 2-year event
Inflow = 0.10 cfs @ 12.11 hrs, Volume= 0.008 af
Outflow = 0.10 cfs @ 12.11 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
Primary = 0.10 cfs @ 12.11 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.26' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.10 cfs @ 12.11 hrs HW=348.26' (Free Discharge)
1=Culvert (Inlet Controls 0.10 cfs @ 1.12 fps)

Summary for Pond 17P: DP4

Inflow Area = 0.998 ac, 30.41% Impervious, Inflow Depth = 0.80" for 2-year event
Inflow = 0.75 cfs @ 12.10 hrs, Volume= 0.066 af
Outflow = 0.75 cfs @ 12.10 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.0 min
Primary = 0.75 cfs @ 12.10 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.15' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	347.69'	**15.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.69' / 347.26' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=0.75 cfs @ 12.10 hrs HW=348.15' (Free Discharge)
1=Culvert (Inlet Controls 0.75 cfs @ 1.83 fps)

Summary for Pond 18P: CB-6

Inflow Area = 0.075 ac, 69.15% Impervious, Inflow Depth = 1.44" for 2-year event
Inflow = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af
Outflow = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min
Primary = 0.12 cfs @ 12.10 hrs, Volume= 0.009 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.08' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.12 cfs @ 12.10 hrs HW=357.08' (Free Discharge)
1=Culvert (Inlet Controls 0.12 cfs @ 1.17 fps)

Summary for Pond 19P: CB-5

Inflow Area = 0.255 ac, 51.42% Impervious, Inflow Depth = 1.72" for 2-year event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 0.037 af
Outflow = 0.50 cfs @ 12.09 hrs, Volume= 0.037 af, Atten= 0%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.09 hrs, Volume= 0.037 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.29' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.50 cfs @ 12.09 hrs HW=357.29' (Free Discharge)
1=Culvert (Inlet Controls 0.50 cfs @ 1.70 fps)

Summary for Pond 20P: DP7

Inflow Area = 0.330 ac, 55.47% Impervious, Inflow Depth = 1.66" for 2-year event
Inflow = 0.63 cfs @ 12.09 hrs, Volume= 0.046 af
Outflow = 0.63 cfs @ 12.09 hrs, Volume= 0.046 af, Atten= 0%, Lag= 0.0 min
Primary = 0.63 cfs @ 12.09 hrs, Volume= 0.046 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 356.94' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.49'	**12.0" Round Culvert** L= 159.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.49' / 347.79' S= 0.0547 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.62 cfs @ 12.09 hrs HW=356.94' (Free Discharge)
1=Culvert (Inlet Controls 0.62 cfs @ 1.80 fps)

Summary for Pond 27P: CB-10

Inflow Area = 0.681 ac, 24.93% Impervious, Inflow Depth = 0.33" for 2-year event
Inflow = 0.11 cfs @ 12.15 hrs, Volume= 0.019 af
Outflow = 0.11 cfs @ 12.15 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.15 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.14' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	361.96'	**12.0" Round Culvert** L= 89.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 361.96' / 359.29' S= 0.0300 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.15 hrs HW=362.14' (Free Discharge)
1=Culvert (Inlet Controls 0.11 cfs @ 1.14 fps)

Summary for Pond 28P: CB-9

Inflow Area = 0.191 ac, 7.80% Impervious, Inflow Depth = 0.91" for 2-year event
Inflow = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af
Outflow = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min
Primary = 0.18 cfs @ 12.10 hrs, Volume= 0.014 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.58' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.34'	**12.0" Round Culvert** L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.34' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.10 hrs HW=360.57' (Free Discharge)
1=Culvert (Inlet Controls 0.18 cfs @ 1.30 fps)

Summary for Pond 29P: DP13

Inflow Area = 1.130 ac, 45.10% Impervious, Inflow Depth = 1.03" for 2-year event
Inflow = 1.27 cfs @ 12.10 hrs, Volume= 0.097 af
Outflow = 1.27 cfs @ 12.10 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.10 hrs, Volume= 0.097 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.50' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	359.93'	**18.0" Round Culvert** L= 64.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 359.93' / 359.29' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.27 cfs @ 12.10 hrs HW=360.50' (Free Discharge)
1=Culvert (Inlet Controls 1.27 cfs @ 2.04 fps)

Summary for Pond 30P: CB-8

Inflow Area = 0.540 ac, 56.59% Impervious, Inflow Depth = 0.96" for 2-year event
Inflow = 0.56 cfs @ 12.10 hrs, Volume= 0.043 af
Outflow = 0.56 cfs @ 12.10 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.10 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.75' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.55 cfs @ 12.10 hrs HW=360.75' (Free Discharge)
1=Culvert (Inlet Controls 0.55 cfs @ 1.75 fps)

Summary for Pond 31P: CB-8

Inflow Area = 0.398 ac, 47.42% Impervious, Inflow Depth = 1.19" for 2-year event
Inflow = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af
Outflow = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.10 hrs, Volume= 0.039 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.74' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.52 cfs @ 12.10 hrs HW=360.74' (Free Discharge)
1=Culvert (Inlet Controls 0.52 cfs @ 1.72 fps)

Summary for Link 1L: DP-A

Inflow Area = 1.476 ac, 24.16% Impervious, Inflow Depth = 0.00" for 2-year event
Inflow = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 21.14 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 2.633 ac, 28.89% Impervious, Inflow Depth = 0.01" for 2-year event
Inflow = 0.00 cfs @ 21.14 hrs, Volume= 0.001 af
Primary = 0.00 cfs @ 21.14 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: POST-B1 Runoff Area=35,830 sf 9.91% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=42 Runoff=0.09 cfs 0.021 af

Subcatchment5S: POST A1 Runoff Area=6,376 sf 6.09% Impervious Runoff Depth=0.31"
Tc=6.0 min CN=42 Runoff=0.02 cfs 0.004 af

Subcatchment6S: POST A2 Runoff Area=14,477 sf 13.39% Impervious Runoff Depth=0.31"
Tc=6.0 min UI Adjusted CN=42 Runoff=0.03 cfs 0.009 af

Subcatchment7S: POST A3 Runoff Area=1,656 sf 64.49% Impervious Runoff Depth=2.61"
Tc=6.0 min CN=77 Runoff=0.11 cfs 0.008 af

Subcatchment9S: POST A4 Runoff Area=7,665 sf 21.20% Impervious Runoff Depth=0.79"
Tc=6.0 min CN=52 Runoff=0.11 cfs 0.012 af

Subcatchment13S: POST A5 Runoff Area=5,473 sf 51.69% Impervious Runoff Depth=1.94"
Tc=6.0 min CN=69 Runoff=0.27 cfs 0.020 af

Subcatchment14S: POST A6 Runoff Area=23,604 sf 10.20% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=55 Runoff=0.49 cfs 0.044 af

Subcatchment21S: POST A8 Runoff Area=11,091 sf 51.42% Impervious Runoff Depth=3.25"
Tc=6.0 min CN=84 Runoff=0.94 cfs 0.069 af

Subcatchment22S: POST A7 Runoff Area=3,287 sf 69.15% Impervious Runoff Depth=2.88"
Tc=6.0 min CN=80 Runoff=0.25 cfs 0.018 af

Subcatchment23S: POST-B2 Runoff Area=23,538 sf 56.59% Impervious Runoff Depth=2.18"
Tc=6.0 min CN=72 Runoff=1.34 cfs 0.098 af

Subcatchment24S: POST-B4 Runoff Area=8,332 sf 7.80% Impervious Runoff Depth=2.10"
Tc=6.0 min CN=71 Runoff=0.46 cfs 0.033 af

Subcatchment25S: POST-B3 Runoff Area=17,344 sf 47.42% Impervious Runoff Depth=2.52"
Tc=6.0 min CN=76 Runoff=1.15 cfs 0.084 af

Subcatchment26S: POST-B5 Runoff Area=29,650 sf 24.93% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=57 Runoff=0.73 cfs 0.062 af

Pond 3P: DETENTION BASIN Peak Elev=346.58' Storage=1,373 cf Inflow=1.94 cfs 0.160 af
Discarded=0.58 cfs 0.160 af Primary=0.00 cfs 0.000 af Outflow=0.58 cfs 0.160 af

Pond 6P: INFIL. B Peak Elev=358.03' Storage=0.071 af Inflow=3.67 cfs 0.277 af
Discarded=0.53 cfs 0.235 af Primary=0.59 cfs 0.042 af Outflow=1.12 cfs 0.277 af

Pond 8P: CB-2 Peak Elev=344.22' Inflow=0.11 cfs 0.008 af
12.0" Round Culvert n=0.012 L=27.0' S=0.0100 '/' Outflow=0.11 cfs 0.008 af

Pond 10P: CB-1 Peak Elev=344.22' Inflow=0.11 cfs 0.012 af
12.0" Round Culvert n=0.012 L=8.0' S=0.0338 '/' Outflow=0.11 cfs 0.012 af

Pond 12P: INFIL. A Peak Elev=343.86' Storage=0.003 af Inflow=0.23 cfs 0.020 af
Discarded=0.09 cfs 0.020 af Secondary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.020 af

Pond 15P: CB-3 Peak Elev=348.48' Inflow=0.49 cfs 0.044 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.49 cfs 0.044 af

Pond 16P: CB-4 Peak Elev=348.38' Inflow=0.27 cfs 0.020 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.27 cfs 0.020 af

Pond 17P: DP4 Peak Elev=348.48' Inflow=1.94 cfs 0.151 af
15.0" Round Culvert n=0.012 L=43.0' S=0.0100 '/' Outflow=1.94 cfs 0.151 af

Pond 18P: CB-6 Peak Elev=357.17' Inflow=0.25 cfs 0.018 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.25 cfs 0.018 af

Pond 19P: CB-5 Peak Elev=357.46' Inflow=0.94 cfs 0.069 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.94 cfs 0.069 af

Pond 20P: DP7 Peak Elev=357.15' Inflow=1.19 cfs 0.087 af
12.0" Round Culvert n=0.012 L=159.0' S=0.0547 '/' Outflow=1.19 cfs 0.087 af

Pond 27P: CB-10 Peak Elev=362.45' Inflow=0.73 cfs 0.062 af
12.0" Round Culvert n=0.012 L=89.0' S=0.0300 '/' Outflow=0.73 cfs 0.062 af

Pond 28P: CB-9 Peak Elev=360.72' Inflow=0.46 cfs 0.033 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=0.46 cfs 0.033 af

Pond 29P: DP13 Peak Elev=360.85' Inflow=2.95 cfs 0.215 af
18.0" Round Culvert n=0.012 L=64.0' S=0.0100 '/' Outflow=2.95 cfs 0.215 af

Pond 30P: CB-8 Peak Elev=361.04' Inflow=1.34 cfs 0.098 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=1.34 cfs 0.098 af

Pond 31P: CB-8 Peak Elev=360.97' Inflow=1.15 cfs 0.084 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=1.15 cfs 0.084 af

Link 1L: DP-A Inflow=0.02 cfs 0.004 af
Primary=0.02 cfs 0.004 af

Link 2L: DP-B Inflow=0.67 cfs 0.063 af
Primary=0.67 cfs 0.063 af

Total Runoff Area = 4.323 ac Runoff Volume = 0.482 af Average Runoff Depth = 1.34"
72.72% Pervious = 3.144 ac 27.28% Impervious = 1.179 ac

Summary for Subcatchment 2S: POST-B1

Runoff = 0.09 cfs @ 12.38 hrs, Volume= 0.021 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
3,550	98	Roofs, HSG A
22,530	39	>75% Grass cover, Good, HSG A
9,750	30	Woods, Good, HSG A
35,830	42	Weighted Average
32,280		90.09% Pervious Area
3,550		9.91% Impervious Area

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

Summary for Subcatchment 5S: POST A1

Runoff = 0.02 cfs @ 12.38 hrs, Volume= 0.004 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
5,531	39	>75% Grass cover, Good, HSG A
457	30	Woods, Good, HSG A
388	98	Paved parking, HSG A
6,376	42	Weighted Average
5,988		93.91% Pervious Area
388		6.09% Impervious Area

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

Summary for Subcatchment 6S: POST A2

Runoff = 0.03 cfs @ 12.38 hrs, Volume= 0.009 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Adj	Description
11,475	39		>75% Grass cover, Good, HSG A
1,064	30		Woods, Good, HSG A
1,938	98		Unconnected roofs, HSG A
14,477	46	42	Weighted Average, UI Adjusted
12,539			86.61% Pervious Area
1,938			13.39% Impervious Area
1,938			100.00% Unconnected

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

Summary for Subcatchment 7S: POST A3

Runoff = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Depth= 2.61"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
588	39	>75% Grass cover, Good, HSG A
1,068	98	Paved parking, HSG A
1,656	77	Weighted Average
588		35.51% Pervious Area
1,068		64.49% Impervious Area

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

Summary for Subcatchment 9S: POST A4

Runoff = 0.11 cfs @ 12.12 hrs, Volume= 0.012 af, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
6,040	39	>75% Grass cover, Good, HSG A
1,625	98	Paved parking, HSG A
7,665	52	Weighted Average
6,040		78.80% Pervious Area
1,625		21.20% Impervious Area

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

Summary for Subcatchment 13S: POST A5

Runoff = 0.27 cfs @ 12.10 hrs, Volume= 0.020 af, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
2,644	39	>75% Grass cover, Good, HSG A
2,168	98	Paved parking, HSG A
661	98	Unconnected roofs, HSG A
5,473	69	Weighted Average
2,644		48.31% Pervious Area
2,829		51.69% Impervious Area
661		23.37% Unconnected

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

Summary for Subcatchment 14S: POST A6

Runoff = 0.49 cfs @ 12.11 hrs, Volume= 0.044 af, Depth= 0.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
2,408	98	Paved parking, HSG A
9,904	39	>75% Grass cover, Good, HSG A
920	80	>75% Grass cover, Good, HSG D
4,110	30	Woods, Good, HSG A
6,262	77	Woods, Good, HSG D
23,604	55	Weighted Average
21,196		89.80% Pervious Area
2,408		10.20% Impervious Area

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

Summary for Subcatchment 21S: POST A8

Runoff = 0.94 cfs @ 12.09 hrs, Volume= 0.069 af, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
1,428	39	>75% Grass cover, Good, HSG A
3,960	80	>75% Grass cover, Good, HSG D
3,753	98	Paved parking, HSG A
656	98	Unconnected roofs, HSG A
1,294	98	Unconnected roofs, HSG D
11,091	84	Weighted Average
5,388		48.58% Pervious Area
5,703		51.42% Impervious Area
1,950		34.19% Unconnected

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

Summary for Subcatchment 22S: POST A7

Runoff = 0.25 cfs @ 12.09 hrs, Volume= 0.018 af, Depth= 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
1,014	39	>75% Grass cover, Good, HSG A
2,273	98	Paved parking, HSG A
3,287	80	Weighted Average
1,014		30.85% Pervious Area
2,273		69.15% Impervious Area

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

Summary for Subcatchment 23S: POST-B2

Runoff = 1.34 cfs @ 12.10 hrs, Volume= 0.098 af, Depth= 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
9,971	39	>75% Grass cover, Good, HSG A
247	30	Woods, Good, HSG A
6,536	98	Paved parking, HSG A
6,784	98	Roofs, HSG A
23,538	72	Weighted Average
10,218		43.41% Pervious Area
13,320		56.59% Impervious Area

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

Summary for Subcatchment 24S: POST-B4

Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.033 af, Depth= 2.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
1,793	39	>75% Grass cover, Good, HSG A
4,921	80	>75% Grass cover, Good, HSG D
138	30	Woods, Good, HSG A
830	77	Woods, Good, HSG D
650	98	Roofs, HSG A
8,332	71	Weighted Average
7,682		92.20% Pervious Area
650		7.80% Impervious Area

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

Summary for Subcatchment 25S: POST-B3

Runoff = 1.15 cfs @ 12.09 hrs, Volume= 0.084 af, Depth= 2.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
5,059	39	>75% Grass cover, Good, HSG A
3,462	80	>75% Grass cover, Good, HSG D
177	30	Woods, Good, HSG A
422	77	Woods, Good, HSG D
6,064	98	Paved parking, HSG A
2,160	98	Roofs, HSG A
17,344	76	Weighted Average
9,120		52.58% Pervious Area
8,224		47.42% Impervious Area

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

Summary for Subcatchment 26S: POST-B5

Runoff = 0.73 cfs @ 12.11 hrs, Volume= 0.062 af, Depth= 1.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.98"

Area (sf)	CN	Description
15,074	39	>75% Grass cover, Good, HSG A
915	80	>75% Grass cover, Good, HSG D
3,920	30	Woods, Good, HSG A
2,348	77	Woods, Good, HSG D
2,439	98	Paved parking, HSG A
4,954	98	Roofs, HSG A
29,650	57	Weighted Average
22,257		75.07% Pervious Area
7,393		24.93% Impervious Area

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

Summary for Pond 3P: DETENTION BASIN

Inflow Area = 1.330 ac, 26.15% Impervious, Inflow Depth = 1.44" for 10-year event
Inflow = 1.94 cfs @ 12.10 hrs, Volume= 0.160 af
Outflow = 0.58 cfs @ 12.49 hrs, Volume= 0.160 af, Atten= 70%, Lag= 23.7 min
Discarded = 0.58 cfs @ 12.49 hrs, Volume= 0.160 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 346.58' @ 12.49 hrs Surf.Area= 2,554 sf Storage= 1,373 cf

Plug-Flow detention time= 15.2 min calculated for 0.160 af (100% of inflow)
Center-of-Mass det. time= 15.2 min (863.5 - 848.3)

Volume	Invert	Avail.Storage	Storage Description
#1	346.00'	14,542 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)
346.00	2,163	220.0	0	0	2,163
347.00	2,853	239.0	2,500	2,500	2,894
348.00	3,600	258.0	3,219	5,719	3,685
349.00	4,404	277.0	3,995	9,715	4,537
350.00	5,264	296.0	4,828	14,542	5,450

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 343.00'
#2	Primary	349.00'	**20.0' long x 16.0' 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 @ 12.49 hrs HW=346.58' (Free Discharge)
↑**1=Exfiltration** (Controls 0.58 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=346.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: INFIL. B

Inflow Area = 1.810 ac, 37.52% Impervious, Inflow Depth = 1.84" for 10-year event
Inflow = 3.67 cfs @ 12.10 hrs, Volume= 0.277 af
Outflow = 1.12 cfs @ 12.47 hrs, Volume= 0.277 af, Atten= 69%, Lag= 22.5 min
Discarded = 0.53 cfs @ 12.47 hrs, Volume= 0.235 af
Primary = 0.59 cfs @ 12.47 hrs, Volume= 0.042 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 358.03' @ 12.47 hrs Surf.Area= 0.039 ac Storage= 0.071 af
Flood Elev= 364.70' Surf.Area= 0.039 ac Storage= 0.152 af

Plug-Flow detention time= 33.2 min calculated for 0.277 af (100% of inflow)
Center-of-Mass det. time= 33.2 min (882.7 - 849.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	355.00'	0.069 af	**39.50'W x 43.37'L x 6.50'H Field A** 0.256 af Overall - 0.082 af Embedded = 0.173 af x 40.0% Voids
#2A	356.50'	0.082 af	**Cultec R-902HD** x 55 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 55 Chambers in 5 Rows Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
		0.152 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	355.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 350.00'
#2	Device 4	360.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	357.00'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	356.00'	**12.0" Round Culvert** L= 139.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.00' / 355.00' S= 0.0072 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Discarded OutFlow Max=0.53 cfs @ 12.47 hrs HW=358.03' (Free Discharge)
└**1=Exfiltration** (Controls 0.53 cfs)

Primary OutFlow Max=0.59 cfs @ 12.47 hrs HW=358.03' (Free Discharge)
└**4=Culvert** (Passes 0.59 cfs of 3.58 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
  └**3=Orifice/Grate** (Orifice Controls 0.59 cfs @ 4.35 fps)

Pond 6P: INFIL. B - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

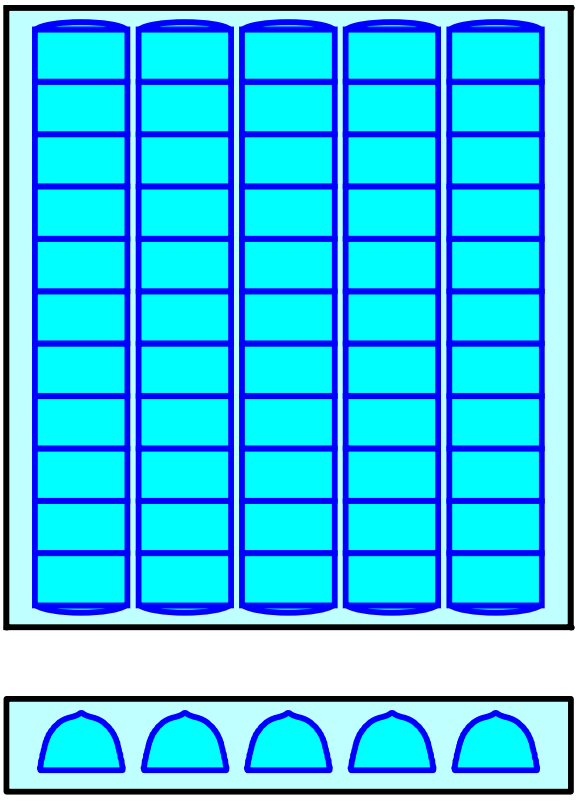
11 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 41.37' Row Length +12.0" End Stone x 2 = 43.37' Base Length
5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 24.0" Side Stone x 2 = 39.50' Base Width
18.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 6.50' Field Height

55 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 5 Rows = 3,588.0 cf Chamber Storage

11,134.4 cf Field - 3,588.0 cf Chambers = 7,546.4 cf Stone x 40.0% Voids = 3,018.5 cf Stone Storage

Chamber Storage + Stone Storage = 6,606.6 cf = 0.152 af
Overall Storage Efficiency = 59.3%
Overall System Size = 43.37' x 39.50' x 6.50'

55 Chambers
412.4 cy Field
279.5 cy Stone



Summary for Pond 8P: CB-2

Inflow Area = 0.038 ac, 64.49% Impervious, Inflow Depth = 2.61" for 10-year event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af
Outflow = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.09 hrs, Volume= 0.008 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.22' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.09 hrs HW=344.22' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.11 cfs @ 1.15 fps)

Summary for Pond 10P: CB-1

Inflow Area = 0.176 ac, 21.20% Impervious, Inflow Depth = 0.79" for 10-year event
Inflow = 0.11 cfs @ 12.12 hrs, Volume= 0.012 af
Outflow = 0.11 cfs @ 12.12 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min
Primary = 0.11 cfs @ 12.12 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.22' @ 12.12 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0338 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.11 cfs @ 12.12 hrs HW=344.22' (Free Discharge)
1=Culvert (Inlet Controls 0.11 cfs @ 1.14 fps)

Summary for Pond 12P: INFIL. A

Inflow Area = 0.214 ac, 28.89% Impervious, Inflow Depth = 1.12" for 10-year event
Inflow = 0.23 cfs @ 12.11 hrs, Volume= 0.020 af
Outflow = 0.09 cfs @ 12.45 hrs, Volume= 0.020 af, Atten= 60%, Lag= 20.6 min
Discarded = 0.09 cfs @ 12.45 hrs, Volume= 0.020 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 343.86' @ 12.45 hrs Surf.Area= 0.009 ac Storage= 0.003 af

Plug-Flow detention time= 6.0 min calculated for 0.020 af (100% of inflow)
Center-of-Mass det. time= 6.2 min (880.4 - 874.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	343.27'	0.007 af	**11.50'W x 34.65'L x 2.71'H Field A** 0.025 af Overall - 0.008 af Embedded = 0.017 af x 40.0% Voids
#2A	343.77'	0.008 af	**Cultec R-180** x 15 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 3 rows
		0.015 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	343.27'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 340.00'
#2	Secondary	346.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.00' S= 0.0500 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Discarded OutFlow Max=0.09 cfs @ 12.45 hrs HW=343.86' (Free Discharge)
└**1=Exfiltration** (Controls 0.09 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=343.27' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond 12P: INFIL. A - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger® 180HD)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 3 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

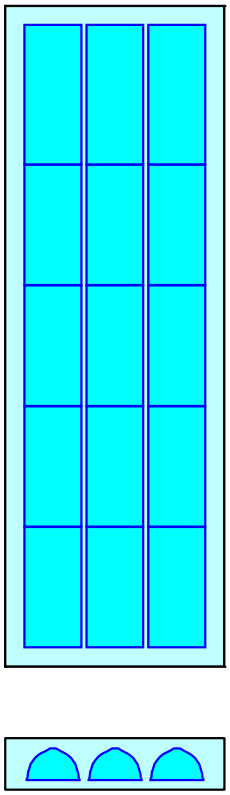
5 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 32.65' Row Length +12.0" End Stone x 2 = 34.65' Base Length
3 Rows x 36.0" Wide + 3.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.50' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

15 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 3 Rows = 336.9 cf Chamber Storage

1,079.2 cf Field - 336.9 cf Chambers = 742.3 cf Stone x 40.0% Voids = 296.9 cf Stone Storage

Chamber Storage + Stone Storage = 633.8 cf = 0.015 af
Overall Storage Efficiency = 58.7%
Overall System Size = 34.65' x 11.50' x 2.71'

15 Chambers
40.0 cy Field
27.5 cy Stone



Summary for Pond 15P: CB-3

Inflow Area = 0.542 ac, 10.20% Impervious, Inflow Depth = 0.97" for 10-year event
Inflow = 0.49 cfs @ 12.11 hrs, Volume= 0.044 af
Outflow = 0.49 cfs @ 12.11 hrs, Volume= 0.044 af, Atten= 0%, Lag= 0.0 min
Primary = 0.49 cfs @ 12.11 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.48' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.11 hrs HW=348.48' (Free Discharge)
1=Culvert (Inlet Controls 0.47 cfs @ 1.67 fps)

Summary for Pond 16P: CB-4

Inflow Area = 0.126 ac, 51.69% Impervious, Inflow Depth = 1.94" for 10-year event
Inflow = 0.27 cfs @ 12.10 hrs, Volume= 0.020 af
Outflow = 0.27 cfs @ 12.10 hrs, Volume= 0.020 af, Atten= 0%, Lag= 0.0 min
Primary = 0.27 cfs @ 12.10 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.38' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.27 cfs @ 12.10 hrs HW=348.38' (Free Discharge)
1=Culvert (Inlet Controls 0.27 cfs @ 1.45 fps)

Summary for Pond 17P: DP4

Inflow Area = 0.998 ac, 30.41% Impervious, Inflow Depth = 1.82" for 10-year event
Inflow = 1.94 cfs @ 12.10 hrs, Volume= 0.151 af
Outflow = 1.94 cfs @ 12.10 hrs, Volume= 0.151 af, Atten= 0%, Lag= 0.0 min
Primary = 1.94 cfs @ 12.10 hrs, Volume= 0.151 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.48' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	347.69'	**15.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.69' / 347.26' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=1.93 cfs @ 12.10 hrs HW=348.47' (Free Discharge)
1=Culvert (Inlet Controls 1.93 cfs @ 2.38 fps)

Summary for Pond 18P: CB-6

Inflow Area = 0.075 ac, 69.15% Impervious, Inflow Depth = 2.88" for 10-year event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 0.018 af
Outflow = 0.25 cfs @ 12.09 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.0 min
Primary = 0.25 cfs @ 12.09 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.17' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.24 cfs @ 12.09 hrs HW=357.16' (Free Discharge)
1=Culvert (Inlet Controls 0.24 cfs @ 1.40 fps)

Summary for Pond 19P: CB-5

Inflow Area = 0.255 ac, 51.42% Impervious, Inflow Depth = 3.25" for 10-year event
Inflow = 0.94 cfs @ 12.09 hrs, Volume= 0.069 af
Outflow = 0.94 cfs @ 12.09 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min
Primary = 0.94 cfs @ 12.09 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.46' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.92 cfs @ 12.09 hrs HW=357.45' (Free Discharge)
1=Culvert (Inlet Controls 0.92 cfs @ 2.02 fps)

Summary for Pond 20P: DP7

Inflow Area = 0.330 ac, 55.47% Impervious, Inflow Depth = 3.17" for 10-year event
Inflow = 1.19 cfs @ 12.09 hrs, Volume= 0.087 af
Outflow = 1.19 cfs @ 12.09 hrs, Volume= 0.087 af, Atten= 0%, Lag= 0.0 min
Primary = 1.19 cfs @ 12.09 hrs, Volume= 0.087 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.15' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.49'	**12.0" Round Culvert** L= 159.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.49' / 347.79' S= 0.0547 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.17 cfs @ 12.09 hrs HW=357.14' (Free Discharge)
1=Culvert (Inlet Controls 1.17 cfs @ 2.17 fps)

Summary for Pond 27P: CB-10

Inflow Area = 0.681 ac, 24.93% Impervious, Inflow Depth = 1.09" for 10-year event
Inflow = 0.73 cfs @ 12.11 hrs, Volume= 0.062 af
Outflow = 0.73 cfs @ 12.11 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.11 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.45' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	361.96'	**12.0" Round Culvert** L= 89.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 361.96' / 359.29' S= 0.0300 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.11 hrs HW=362.45' (Free Discharge)
1=Culvert (Inlet Controls 0.71 cfs @ 1.87 fps)

Summary for Pond 28P: CB-9

Inflow Area = 0.191 ac, 7.80% Impervious, Inflow Depth = 2.10" for 10-year event
Inflow = 0.46 cfs @ 12.10 hrs, Volume= 0.033 af
Outflow = 0.46 cfs @ 12.10 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Primary = 0.46 cfs @ 12.10 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.72' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.34'	**12.0" Round Culvert** L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.34' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.45 cfs @ 12.10 hrs HW=360.72' (Free Discharge)
1=Culvert (Inlet Controls 0.45 cfs @ 1.65 fps)

Summary for Pond 29P: DP13

Inflow Area = 1.130 ac, 45.10% Impervious, Inflow Depth = 2.29" for 10-year event
Inflow = 2.95 cfs @ 12.10 hrs, Volume= 0.215 af
Outflow = 2.95 cfs @ 12.10 hrs, Volume= 0.215 af, Atten= 0%, Lag= 0.0 min
Primary = 2.95 cfs @ 12.10 hrs, Volume= 0.215 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.85' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	359.93'	**18.0" Round Culvert** L= 64.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 359.93' / 359.29' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.91 cfs @ 12.10 hrs HW=360.85' (Free Discharge)
1=Culvert (Inlet Controls 2.91 cfs @ 2.57 fps)

Summary for Pond 30P: CB-8

Inflow Area = 0.540 ac, 56.59% Impervious, Inflow Depth = 2.18" for 10-year event
Inflow = 1.34 cfs @ 12.10 hrs, Volume= 0.098 af
Outflow = 1.34 cfs @ 12.10 hrs, Volume= 0.098 af, Atten= 0%, Lag= 0.0 min
Primary = 1.34 cfs @ 12.10 hrs, Volume= 0.098 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.04' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.33 cfs @ 12.10 hrs HW=361.03' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.33 cfs @ 2.25 fps)

Summary for Pond 31P: CB-8

Inflow Area = 0.398 ac, 47.42% Impervious, Inflow Depth = 2.52" for 10-year event
Inflow = 1.15 cfs @ 12.09 hrs, Volume= 0.084 af
Outflow = 1.15 cfs @ 12.09 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.0 min
Primary = 1.15 cfs @ 12.09 hrs, Volume= 0.084 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.97' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.13 cfs @ 12.09 hrs HW=360.97' (Free Discharge)
1=Culvert (Inlet Controls 1.13 cfs @ 2.15 fps)

Summary for Link 1L: DP-A

Inflow Area = 1.476 ac, 24.16% Impervious, Inflow Depth = 0.03" for 10-year event
Inflow = 0.02 cfs @ 12.38 hrs, Volume= 0.004 af
Primary = 0.02 cfs @ 12.38 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 2.633 ac, 28.89% Impervious, Inflow Depth = 0.29" for 10-year event
Inflow = 0.67 cfs @ 12.44 hrs, Volume= 0.063 af
Primary = 0.67 cfs @ 12.44 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: POST-B1 Runoff Area=35,830 sf 9.91% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=42 Runoff=0.27 cfs 0.043 af

Subcatchment5S: POST A1 Runoff Area=6,376 sf 6.09% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=42 Runoff=0.05 cfs 0.008 af

Subcatchment6S: POST A2 Runoff Area=14,477 sf 13.39% Impervious Runoff Depth=0.63"
Tc=6.0 min UI Adjusted CN=42 Runoff=0.11 cfs 0.018 af

Subcatchment7S: POST A3 Runoff Area=1,656 sf 64.49% Impervious Runoff Depth=3.52"
Tc=6.0 min CN=77 Runoff=0.15 cfs 0.011 af

Subcatchment9S: POST A4 Runoff Area=7,665 sf 21.20% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=52 Runoff=0.22 cfs 0.019 af

Subcatchment13S: POST A5 Runoff Area=5,473 sf 51.69% Impervious Runoff Depth=2.75"
Tc=6.0 min CN=69 Runoff=0.39 cfs 0.029 af

Subcatchment14S: POST A6 Runoff Area=23,604 sf 10.20% Impervious Runoff Depth=1.55"
Tc=6.0 min CN=55 Runoff=0.86 cfs 0.070 af

Subcatchment21S: POST A8 Runoff Area=11,091 sf 51.42% Impervious Runoff Depth=4.24"
Tc=6.0 min CN=84 Runoff=1.22 cfs 0.090 af

Subcatchment22S: POST A7 Runoff Area=3,287 sf 69.15% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=80 Runoff=0.33 cfs 0.024 af

Subcatchment23S: POST-B2 Runoff Area=23,538 sf 56.59% Impervious Runoff Depth=3.03"
Tc=6.0 min CN=72 Runoff=1.88 cfs 0.137 af

Subcatchment24S: POST-B4 Runoff Area=8,332 sf 7.80% Impervious Runoff Depth=2.94"
Tc=6.0 min CN=71 Runoff=0.64 cfs 0.047 af

Subcatchment25S: POST-B3 Runoff Area=17,344 sf 47.42% Impervious Runoff Depth=3.42"
Tc=6.0 min CN=76 Runoff=1.57 cfs 0.114 af

Subcatchment26S: POST-B5 Runoff Area=29,650 sf 24.93% Impervious Runoff Depth=1.71"
Tc=6.0 min CN=57 Runoff=1.23 cfs 0.097 af

Pond 3P: DETENTION BASIN Peak Elev=346.99' Storage=2,460 cf Inflow=2.89 cfs 0.230 af
Discarded=0.70 cfs 0.230 af Primary=0.00 cfs 0.000 af Outflow=0.70 cfs 0.230 af

Pond 6P: INFIL. B Peak Elev=359.29' Storage=0.108 af Inflow=5.32 cfs 0.394 af
Discarded=0.61 cfs 0.295 af Primary=0.95 cfs 0.099 af Outflow=1.56 cfs 0.394 af

Pond 8P: CB-2 Peak Elev=344.25' Inflow=0.15 cfs 0.011 af
12.0" Round Culvert n=0.012 L=27.0' S=0.0100 '/' Outflow=0.15 cfs 0.011 af

Pond 10P: CB-1 Peak Elev=344.30' Inflow=0.22 cfs 0.019 af
12.0" Round Culvert n=0.012 L=8.0' S=0.0338 '/' Outflow=0.22 cfs 0.019 af

Pond 12P: INFIL. A Peak Elev=344.38' Storage=0.006 af Inflow=0.38 cfs 0.030 af
Discarded=0.10 cfs 0.030 af Secondary=0.00 cfs 0.000 af Outflow=0.10 cfs 0.030 af

Pond 15P: CB-3 Peak Elev=348.63' Inflow=0.86 cfs 0.070 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.86 cfs 0.070 af

Pond 16P: CB-4 Peak Elev=348.44' Inflow=0.39 cfs 0.029 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.39 cfs 0.029 af

Pond 17P: DP4 Peak Elev=348.68' Inflow=2.80 cfs 0.213 af
15.0" Round Culvert n=0.012 L=43.0' S=0.0100 '/' Outflow=2.80 cfs 0.213 af

Pond 18P: CB-6 Peak Elev=357.21' Inflow=0.33 cfs 0.024 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.33 cfs 0.024 af

Pond 19P: CB-5 Peak Elev=357.56' Inflow=1.22 cfs 0.090 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=1.22 cfs 0.090 af

Pond 20P: DP7 Peak Elev=357.27' Inflow=1.55 cfs 0.114 af
12.0" Round Culvert n=0.012 L=159.0' S=0.0547 '/' Outflow=1.55 cfs 0.114 af

Pond 27P: CB-10 Peak Elev=362.63' Inflow=1.23 cfs 0.097 af
12.0" Round Culvert n=0.012 L=89.0' S=0.0300 '/' Outflow=1.23 cfs 0.097 af

Pond 28P: CB-9 Peak Elev=360.80' Inflow=0.64 cfs 0.047 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=0.64 cfs 0.047 af

Pond 29P: DP13 Peak Elev=361.06' Inflow=4.09 cfs 0.297 af
18.0" Round Culvert n=0.012 L=64.0' S=0.0100 '/' Outflow=4.09 cfs 0.297 af

Pond 30P: CB-8 Peak Elev=361.22' Inflow=1.88 cfs 0.137 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=1.88 cfs 0.137 af

Pond 31P: CB-8 Peak Elev=361.11' Inflow=1.57 cfs 0.114 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=1.57 cfs 0.114 af

Link 1L: DP-A Inflow=0.05 cfs 0.008 af
Primary=0.05 cfs 0.008 af

Link 2L: DP-B Inflow=1.16 cfs 0.142 af
Primary=1.16 cfs 0.142 af

Total Runoff Area = 4.323 ac Runoff Volume = 0.706 af Average Runoff Depth = 1.96"
72.72% Pervious = 3.144 ac 27.28% Impervious = 1.179 ac

Summary for Subcatchment 2S: POST-B1

Runoff = 0.27 cfs @ 12.17 hrs, Volume= 0.043 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
3,550	98	Roofs, HSG A
22,530	39	>75% Grass cover, Good, HSG A
9,750	30	Woods, Good, HSG A
35,830	42	Weighted Average
32,280		90.09% Pervious Area
3,550		9.91% Impervious Area

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

Summary for Subcatchment 5S: POST A1

Runoff = 0.05 cfs @ 12.17 hrs, Volume= 0.008 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
5,531	39	>75% Grass cover, Good, HSG A
457	30	Woods, Good, HSG A
388	98	Paved parking, HSG A
6,376	42	Weighted Average
5,988		93.91% Pervious Area
388		6.09% Impervious Area

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

Summary for Subcatchment 6S: POST A2

Runoff = 0.11 cfs @ 12.17 hrs, Volume= 0.018 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Adj	Description
11,475	39		>75% Grass cover, Good, HSG A
1,064	30		Woods, Good, HSG A
1,938	98		Unconnected roofs, HSG A
14,477	46	42	Weighted Average, UI Adjusted
12,539			86.61% Pervious Area
1,938			13.39% Impervious Area
1,938			100.00% Unconnected

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

Summary for Subcatchment 7S: POST A3

Runoff = 0.15 cfs @ 12.09 hrs, Volume= 0.011 af, Depth= 3.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
588	39	>75% Grass cover, Good, HSG A
1,068	98	Paved parking, HSG A
1,656	77	Weighted Average
588		35.51% Pervious Area
1,068		64.49% Impervious Area

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

Summary for Subcatchment 9S: POST A4

Runoff = 0.22 cfs @ 12.11 hrs, Volume= 0.019 af, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
6,040	39	>75% Grass cover, Good, HSG A
1,625	98	Paved parking, HSG A
7,665	52	Weighted Average
6,040		78.80% Pervious Area
1,625		21.20% Impervious Area

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

Summary for Subcatchment 13S: POST A5

Runoff = 0.39 cfs @ 12.10 hrs, Volume= 0.029 af, Depth= 2.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
2,644	39	>75% Grass cover, Good, HSG A
2,168	98	Paved parking, HSG A
661	98	Unconnected roofs, HSG A
5,473	69	Weighted Average
2,644		48.31% Pervious Area
2,829		51.69% Impervious Area
661		23.37% Unconnected

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

Summary for Subcatchment 14S: POST A6

Runoff = 0.86 cfs @ 12.10 hrs, Volume= 0.070 af, Depth= 1.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
2,408	98	Paved parking, HSG A
9,904	39	>75% Grass cover, Good, HSG A
920	80	>75% Grass cover, Good, HSG D
4,110	30	Woods, Good, HSG A
6,262	77	Woods, Good, HSG D
23,604	55	Weighted Average
21,196		89.80% Pervious Area
2,408		10.20% Impervious Area

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

Summary for Subcatchment 21S: POST A8

Runoff = 1.22 cfs @ 12.09 hrs, Volume= 0.090 af, Depth= 4.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
1,428	39	>75% Grass cover, Good, HSG A
3,960	80	>75% Grass cover, Good, HSG D
3,753	98	Paved parking, HSG A
656	98	Unconnected roofs, HSG A
1,294	98	Unconnected roofs, HSG D
11,091	84	Weighted Average
5,388		48.58% Pervious Area
5,703		51.42% Impervious Area
1,950		34.19% Unconnected

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

Summary for Subcatchment 22S: POST A7

Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.024 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
1,014	39	>75% Grass cover, Good, HSG A
2,273	98	Paved parking, HSG A
3,287	80	Weighted Average
1,014		30.85% Pervious Area
2,273		69.15% Impervious Area

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

Summary for Subcatchment 23S: POST-B2

Runoff = 1.88 cfs @ 12.09 hrs, Volume= 0.137 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
9,971	39	>75% Grass cover, Good, HSG A
247	30	Woods, Good, HSG A
6,536	98	Paved parking, HSG A
6,784	98	Roofs, HSG A
23,538	72	Weighted Average
10,218		43.41% Pervious Area
13,320		56.59% Impervious Area

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

Summary for Subcatchment 24S: POST-B4

Runoff = 0.64 cfs @ 12.09 hrs, Volume= 0.047 af, Depth= 2.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
1,793	39	>75% Grass cover, Good, HSG A
4,921	80	>75% Grass cover, Good, HSG D
138	30	Woods, Good, HSG A
830	77	Woods, Good, HSG D
650	98	Roofs, HSG A
8,332	71	Weighted Average
7,682		92.20% Pervious Area
650		7.80% Impervious Area

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

Summary for Subcatchment 25S: POST-B3

Runoff = 1.57 cfs @ 12.09 hrs, Volume= 0.114 af, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
5,059	39	>75% Grass cover, Good, HSG A
3,462	80	>75% Grass cover, Good, HSG D
177	30	Woods, Good, HSG A
422	77	Woods, Good, HSG D
6,064	98	Paved parking, HSG A
2,160	98	Roofs, HSG A
17,344	76	Weighted Average
9,120		52.58% Pervious Area
8,224		47.42% Impervious Area

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

Summary for Subcatchment 26S: POST-B5

Runoff = 1.23 cfs @ 12.10 hrs, Volume= 0.097 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.05"

Area (sf)	CN	Description
15,074	39	>75% Grass cover, Good, HSG A
915	80	>75% Grass cover, Good, HSG D
3,920	30	Woods, Good, HSG A
2,348	77	Woods, Good, HSG D
2,439	98	Paved parking, HSG A
4,954	98	Roofs, HSG A
29,650	57	Weighted Average
22,257		75.07% Pervious Area
7,393		24.93% Impervious Area

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

Summary for Pond 3P: DETENTION BASIN

Inflow Area = 1.330 ac, 26.15% Impervious, Inflow Depth = 2.08" for 25-year event
Inflow = 2.89 cfs @ 12.10 hrs, Volume= 0.230 af
Outflow = 0.70 cfs @ 12.53 hrs, Volume= 0.230 af, Atten= 76%, Lag= 26.1 min
Discarded = 0.70 cfs @ 12.53 hrs, Volume= 0.230 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 346.99' @ 12.53 hrs Surf.Area= 2,843 sf Storage= 2,460 cf

Plug-Flow detention time= 25.4 min calculated for 0.230 af (100% of inflow)
Center-of-Mass det. time= 25.4 min (866.5 - 841.1)

Volume	Invert	Avail.Storage	Storage Description
#1	346.00'	14,542 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)
346.00	2,163	220.0	0	0	2,163
347.00	2,853	239.0	2,500	2,500	2,894
348.00	3,600	258.0	3,219	5,719	3,685
349.00	4,404	277.0	3,995	9,715	4,537
350.00	5,264	296.0	4,828	14,542	5,450

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 343.00'
#2	Primary	349.00'	**20.0' long x 16.0' 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 @ 12.53 hrs HW=346.99' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.70 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=346.00' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: INFIL. B

Inflow Area = 1.810 ac, 37.52% Impervious, Inflow Depth = 2.61" for 25-year event
Inflow = 5.32 cfs @ 12.10 hrs, Volume= 0.394 af
Outflow = 1.56 cfs @ 12.47 hrs, Volume= 0.394 af, Atten= 71%, Lag= 22.5 min
Discarded = 0.61 cfs @ 12.47 hrs, Volume= 0.295 af
Primary = 0.95 cfs @ 12.47 hrs, Volume= 0.099 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 359.29' @ 12.47 hrs Surf.Area= 0.039 ac Storage= 0.108 af
Flood Elev= 364.70' Surf.Area= 0.039 ac Storage= 0.152 af

Plug-Flow detention time= 36.6 min calculated for 0.394 af (100% of inflow)
Center-of-Mass det. time= 36.6 min (876.5 - 839.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	355.00'	0.069 af	**39.50'W x 43.37'L x 6.50'H Field A** 0.256 af Overall - 0.082 af Embedded = 0.173 af x 40.0% Voids
#2A	356.50'	0.082 af	**Cultec R-902HD** x 55 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 55 Chambers in 5 Rows Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
		0.152 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	355.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 350.00'
#2	Device 4	360.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	357.00'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	356.00'	**12.0" Round Culvert** L= 139.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.00' / 355.00' S= 0.0072 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Discarded OutFlow Max=0.61 cfs @ 12.47 hrs HW=359.28' (Free Discharge)
└**1=Exfiltration** (Controls 0.61 cfs)

Primary OutFlow Max=0.95 cfs @ 12.47 hrs HW=359.28' (Free Discharge)
└**4=Culvert** (Passes 0.95 cfs of 4.56 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)
  └**3=Orifice/Grate** (Orifice Controls 0.95 cfs @ 6.93 fps)

Pond 6P: INFIL. B - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

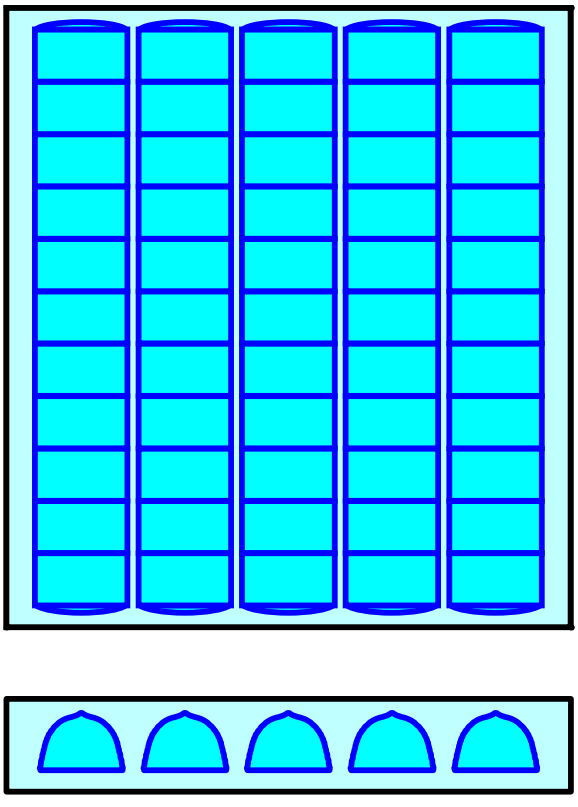
11 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 41.37' Row Length +12.0" End Stone x 2 = 43.37' Base Length
5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 24.0" Side Stone x 2 = 39.50' Base Width
18.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 6.50' Field Height

55 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 5 Rows = 3,588.0 cf Chamber Storage

11,134.4 cf Field - 3,588.0 cf Chambers = 7,546.4 cf Stone x 40.0% Voids = 3,018.5 cf Stone Storage

Chamber Storage + Stone Storage = 6,606.6 cf = 0.152 af
Overall Storage Efficiency = 59.3%
Overall System Size = 43.37' x 39.50' x 6.50'

55 Chambers
412.4 cy Field
279.5 cy Stone



Summary for Pond 8P: CB-2

Inflow Area = 0.038 ac, 64.49% Impervious, Inflow Depth = 3.52" for 25-year event
Inflow = 0.15 cfs @ 12.09 hrs, Volume= 0.011 af
Outflow = 0.15 cfs @ 12.09 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min
Primary = 0.15 cfs @ 12.09 hrs, Volume= 0.011 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.25' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 12.09 hrs HW=344.25' (Free Discharge)
1=Culvert (Inlet Controls 0.15 cfs @ 1.24 fps)

Summary for Pond 10P: CB-1

Inflow Area = 0.176 ac, 21.20% Impervious, Inflow Depth = 1.32" for 25-year event
Inflow = 0.22 cfs @ 12.11 hrs, Volume= 0.019 af
Outflow = 0.22 cfs @ 12.11 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.11 hrs, Volume= 0.019 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.30' @ 12.11 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0338 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.22 cfs @ 12.11 hrs HW=344.30' (Free Discharge)
1=Culvert (Inlet Controls 0.22 cfs @ 1.37 fps)

Summary for Pond 12P: INFIL. A

Inflow Area = 0.214 ac, 28.89% Impervious, Inflow Depth = 1.71" for 25-year event
Inflow = 0.38 cfs @ 12.10 hrs, Volume= 0.030 af
Outflow = 0.10 cfs @ 12.53 hrs, Volume= 0.030 af, Atten= 73%, Lag= 25.4 min
Discarded = 0.10 cfs @ 12.53 hrs, Volume= 0.030 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 344.38' @ 12.53 hrs Surf.Area= 0.009 ac Storage= 0.006 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 15.9 min (878.3 - 862.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	343.27'	0.007 af	**11.50'W x 34.65'L x 2.71'H Field A** 0.025 af Overall - 0.008 af Embedded = 0.017 af x 40.0% Voids
#2A	343.77'	0.008 af	**Cultec R-180** x 15 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 3 rows
		0.015 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	343.27'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 340.00'
#2	Secondary	346.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.00' S= 0.0500 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Discarded OutFlow Max=0.10 cfs @ 12.53 hrs HW=344.38' (Free Discharge)
└**1=Exfiltration** (Controls 0.10 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=343.27' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)

Pond 12P: INFIL. A - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger® 180HD)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 3 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

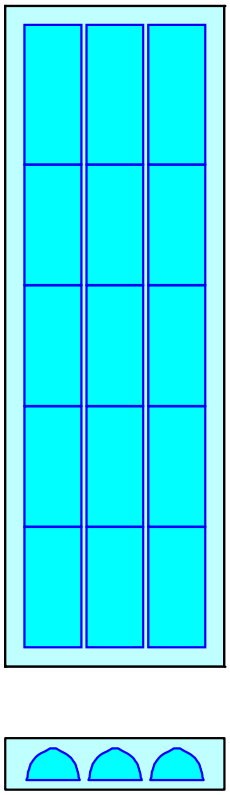
5 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 32.65' Row Length +12.0" End Stone x 2 = 34.65' Base Length
3 Rows x 36.0" Wide + 3.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.50' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

15 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 3 Rows = 336.9 cf Chamber Storage

1,079.2 cf Field - 336.9 cf Chambers = 742.3 cf Stone x 40.0% Voids = 296.9 cf Stone Storage

Chamber Storage + Stone Storage = 633.8 cf = 0.015 af
Overall Storage Efficiency = 58.7%
Overall System Size = 34.65' x 11.50' x 2.71'

15 Chambers
40.0 cy Field
27.5 cy Stone



Summary for Pond 15P: CB-3

Inflow Area = 0.542 ac, 10.20% Impervious, Inflow Depth = 1.55" for 25-year event
Inflow = 0.86 cfs @ 12.10 hrs, Volume= 0.070 af
Outflow = 0.86 cfs @ 12.10 hrs, Volume= 0.070 af, Atten= 0%, Lag= 0.0 min
Primary = 0.86 cfs @ 12.10 hrs, Volume= 0.070 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.63' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.85 cfs @ 12.10 hrs HW=348.63' (Free Discharge)
↑**1=Culvert** (Inlet Controls 0.85 cfs @ 1.97 fps)

Summary for Pond 16P: CB-4

Inflow Area = 0.126 ac, 51.69% Impervious, Inflow Depth = 2.75" for 25-year event
Inflow = 0.39 cfs @ 12.10 hrs, Volume= 0.029 af
Outflow = 0.39 cfs @ 12.10 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.10 hrs, Volume= 0.029 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.44' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.39 cfs @ 12.10 hrs HW=348.44' (Free Discharge)
1=Culvert (Inlet Controls 0.39 cfs @ 1.59 fps)

Summary for Pond 17P: DP4

Inflow Area = 0.998 ac, 30.41% Impervious, Inflow Depth = 2.56" for 25-year event
Inflow = 2.80 cfs @ 12.10 hrs, Volume= 0.213 af
Outflow = 2.80 cfs @ 12.10 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min
Primary = 2.80 cfs @ 12.10 hrs, Volume= 0.213 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.68' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	347.69'	**15.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.69' / 347.26' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=2.77 cfs @ 12.10 hrs HW=348.68' (Free Discharge)
1=Culvert (Inlet Controls 2.77 cfs @ 2.67 fps)

Summary for Pond 18P: CB-6

Inflow Area = 0.075 ac, 69.15% Impervious, Inflow Depth = 3.83" for 25-year event
Inflow = 0.33 cfs @ 12.09 hrs, Volume= 0.024 af
Outflow = 0.33 cfs @ 12.09 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.0 min
Primary = 0.33 cfs @ 12.09 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.21' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.32 cfs @ 12.09 hrs HW=357.21' (Free Discharge)
1=Culvert (Inlet Controls 0.32 cfs @ 1.51 fps)

Summary for Pond 19P: CB-5

Inflow Area = 0.255 ac, 51.42% Impervious, Inflow Depth = 4.24" for 25-year event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.090 af
Outflow = 1.22 cfs @ 12.09 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min
Primary = 1.22 cfs @ 12.09 hrs, Volume= 0.090 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.56' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.09 hrs HW=357.55' (Free Discharge)
1=Culvert (Inlet Controls 1.19 cfs @ 2.18 fps)

Summary for Pond 20P: DP7

Inflow Area = 0.330 ac, 55.47% Impervious, Inflow Depth = 4.15" for 25-year event
Inflow = 1.55 cfs @ 12.09 hrs, Volume= 0.114 af
Outflow = 1.55 cfs @ 12.09 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min
Primary = 1.55 cfs @ 12.09 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.27' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.49'	**12.0" Round Culvert** L= 159.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.49' / 347.79' S= 0.0547 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.52 cfs @ 12.09 hrs HW=357.25' (Free Discharge)
1=Culvert (Inlet Controls 1.52 cfs @ 2.35 fps)

Summary for Pond 27P: CB-10

Inflow Area = 0.681 ac, 24.93% Impervious, Inflow Depth = 1.71" for 25-year event
Inflow = 1.23 cfs @ 12.10 hrs, Volume= 0.097 af
Outflow = 1.23 cfs @ 12.10 hrs, Volume= 0.097 af, Atten= 0%, Lag= 0.0 min
Primary = 1.23 cfs @ 12.10 hrs, Volume= 0.097 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.63' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	361.96'	**12.0" Round Culvert** L= 89.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 361.96' / 359.29' S= 0.0300 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.22 cfs @ 12.10 hrs HW=362.63' (Free Discharge)
1=Culvert (Inlet Controls 1.22 cfs @ 2.19 fps)

Summary for Pond 28P: CB-9

Inflow Area = 0.191 ac, 7.80% Impervious, Inflow Depth = 2.94" for 25-year event
Inflow = 0.64 cfs @ 12.09 hrs, Volume= 0.047 af
Outflow = 0.64 cfs @ 12.09 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min
Primary = 0.64 cfs @ 12.09 hrs, Volume= 0.047 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.80' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.34'	**12.0" Round Culvert** L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.34' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.09 hrs HW=360.80' (Free Discharge)
1=Culvert (Inlet Controls 0.64 cfs @ 1.82 fps)

Summary for Pond 29P: DP13

Inflow Area = 1.130 ac, 45.10% Impervious, Inflow Depth = 3.16" for 25-year event
Inflow = 4.09 cfs @ 12.09 hrs, Volume= 0.297 af
Outflow = 4.09 cfs @ 12.09 hrs, Volume= 0.297 af, Atten= 0%, Lag= 0.0 min
Primary = 4.09 cfs @ 12.09 hrs, Volume= 0.297 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.06' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	359.93'	**18.0" Round Culvert** L= 64.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 359.93' / 359.29' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.03 cfs @ 12.09 hrs HW=361.05' (Free Discharge)
1=Culvert (Inlet Controls 4.03 cfs @ 2.84 fps)

Summary for Pond 30P: CB-8

Inflow Area = 0.540 ac, 56.59% Impervious, Inflow Depth = 3.03" for 25-year event
Inflow = 1.88 cfs @ 12.09 hrs, Volume= 0.137 af
Outflow = 1.88 cfs @ 12.09 hrs, Volume= 0.137 af, Atten= 0%, Lag= 0.0 min
Primary = 1.88 cfs @ 12.09 hrs, Volume= 0.137 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.22' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.85 cfs @ 12.09 hrs HW=361.21' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.85 cfs @ 2.53 fps)

Summary for Pond 31P: CB-8

Inflow Area = 0.398 ac, 47.42% Impervious, Inflow Depth = 3.42" for 25-year event
Inflow = 1.57 cfs @ 12.09 hrs, Volume= 0.114 af
Outflow = 1.57 cfs @ 12.09 hrs, Volume= 0.114 af, Atten= 0%, Lag= 0.0 min
Primary = 1.57 cfs @ 12.09 hrs, Volume= 0.114 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.11' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.09 hrs HW=361.10' (Free Discharge)
↑**1=Culvert** (Inlet Controls 1.54 cfs @ 2.36 fps)

Summary for Link 1L: DP-A

Inflow Area = 1.476 ac, 24.16% Impervious, Inflow Depth = 0.06" for 25-year event
Inflow = 0.05 cfs @ 12.17 hrs, Volume= 0.008 af
Primary = 0.05 cfs @ 12.17 hrs, Volume= 0.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 2.633 ac, 28.89% Impervious, Inflow Depth = 0.65" for 25-year event
Inflow = 1.16 cfs @ 12.38 hrs, Volume= 0.142 af
Primary = 1.16 cfs @ 12.38 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Time span=0.00-72.00 hrs, dt=0.05 hrs, 1441 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment2S: POST-B1 Runoff Area=35,830 sf 9.91% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=42 Runoff=0.91 cfs 0.089 af

Subcatchment5S: POST A1 Runoff Area=6,376 sf 6.09% Impervious Runoff Depth=1.31"
Tc=6.0 min CN=42 Runoff=0.16 cfs 0.016 af

Subcatchment6S: POST A2 Runoff Area=14,477 sf 13.39% Impervious Runoff Depth=1.31"
Tc=6.0 min UI Adjusted CN=42 Runoff=0.37 cfs 0.036 af

Subcatchment7S: POST A3 Runoff Area=1,656 sf 64.49% Impervious Runoff Depth=5.01"
Tc=6.0 min CN=77 Runoff=0.22 cfs 0.016 af

Subcatchment9S: POST A4 Runoff Area=7,665 sf 21.20% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=52 Runoff=0.43 cfs 0.033 af

Subcatchment13S: POST A5 Runoff Area=5,473 sf 51.69% Impervious Runoff Depth=4.10"
Tc=6.0 min CN=69 Runoff=0.59 cfs 0.043 af

Subcatchment14S: POST A6 Runoff Area=23,604 sf 10.20% Impervious Runoff Depth=2.59"
Tc=6.0 min CN=55 Runoff=1.54 cfs 0.117 af

Subcatchment21S: POST A8 Runoff Area=11,091 sf 51.42% Impervious Runoff Depth=5.82"
Tc=6.0 min CN=84 Runoff=1.65 cfs 0.123 af

Subcatchment22S: POST A7 Runoff Area=3,287 sf 69.15% Impervious Runoff Depth=5.35"
Tc=6.0 min CN=80 Runoff=0.46 cfs 0.034 af

Subcatchment23S: POST-B2 Runoff Area=23,538 sf 56.59% Impervious Runoff Depth=4.44"
Tc=6.0 min CN=72 Runoff=2.76 cfs 0.200 af

Subcatchment24S: POST-B4 Runoff Area=8,332 sf 7.80% Impervious Runoff Depth=4.33"
Tc=6.0 min CN=71 Runoff=0.95 cfs 0.069 af

Subcatchment25S: POST-B3 Runoff Area=17,344 sf 47.42% Impervious Runoff Depth=4.89"
Tc=6.0 min CN=76 Runoff=2.23 cfs 0.162 af

Subcatchment26S: POST-B5 Runoff Area=29,650 sf 24.93% Impervious Runoff Depth=2.80"
Tc=6.0 min CN=57 Runoff=2.12 cfs 0.159 af

Pond 3P: DETENTION BASIN Peak Elev=347.65' Storage=4,494 cf Inflow=4.59 cfs 0.353 af
Discarded=0.91 cfs 0.353 af Primary=0.00 cfs 0.000 af Outflow=0.91 cfs 0.353 af

Pond 6P: INFIL. B Peak Elev=360.85' Storage=0.141 af Inflow=8.05 cfs 0.590 af
Discarded=0.71 cfs 0.377 af Primary=3.95 cfs 0.213 af Outflow=4.66 cfs 0.590 af

Pond 8P: CB-2 Peak Elev=344.30' Inflow=0.22 cfs 0.016 af
12.0" Round Culvert n=0.012 L=27.0' S=0.0100 '/' Outflow=0.22 cfs 0.016 af

Pond 10P: CB-1 Peak Elev=344.41' Inflow=0.43 cfs 0.033 af
12.0" Round Culvert n=0.012 L=8.0' S=0.0338 '/' Outflow=0.43 cfs 0.033 af

Pond 12P: INFIL. A Peak Elev=345.70' Storage=0.014 af Inflow=0.65 cfs 0.049 af
Discarded=0.13 cfs 0.049 af Secondary=0.00 cfs 0.000 af Outflow=0.13 cfs 0.049 af

Pond 15P: CB-3 Peak Elev=348.86' Inflow=1.54 cfs 0.117 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=1.54 cfs 0.117 af

Pond 16P: CB-4 Peak Elev=348.53' Inflow=0.59 cfs 0.043 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.59 cfs 0.043 af

Pond 17P: DP4 Peak Elev=349.14' Inflow=4.24 cfs 0.317 af
15.0" Round Culvert n=0.012 L=43.0' S=0.0100 '/' Outflow=4.24 cfs 0.317 af

Pond 18P: CB-6 Peak Elev=357.27' Inflow=0.46 cfs 0.034 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=0.46 cfs 0.034 af

Pond 19P: CB-5 Peak Elev=357.70' Inflow=1.65 cfs 0.123 af
12.0" Round Culvert n=0.012 L=15.0' S=0.0200 '/' Outflow=1.65 cfs 0.123 af

Pond 20P: DP7 Peak Elev=357.48' Inflow=2.11 cfs 0.157 af
12.0" Round Culvert n=0.012 L=159.0' S=0.0547 '/' Outflow=2.11 cfs 0.157 af

Pond 27P: CB-10 Peak Elev=362.97' Inflow=2.12 cfs 0.159 af
12.0" Round Culvert n=0.012 L=89.0' S=0.0300 '/' Outflow=2.12 cfs 0.159 af

Pond 28P: CB-9 Peak Elev=360.91' Inflow=0.95 cfs 0.069 af
12.0" Round Culvert n=0.012 L=31.0' S=0.0100 '/' Outflow=0.95 cfs 0.069 af

Pond 29P: DP13 Peak Elev=361.46' Inflow=5.93 cfs 0.431 af
18.0" Round Culvert n=0.012 L=64.0' S=0.0100 '/' Outflow=5.93 cfs 0.431 af

Pond 30P: CB-8 Peak Elev=361.68' Inflow=2.76 cfs 0.200 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=2.76 cfs 0.200 af

Pond 31P: CB-8 Peak Elev=361.38' Inflow=2.23 cfs 0.162 af
12.0" Round Culvert n=0.012 L=30.0' S=0.0100 '/' Outflow=2.23 cfs 0.162 af

Link 1L: DP-A Inflow=0.16 cfs 0.016 af
Primary=0.16 cfs 0.016 af

Link 2L: DP-B Inflow=4.60 cfs 0.303 af
Primary=4.60 cfs 0.303 af

Total Runoff Area = 4.323 ac Runoff Volume = 1.098 af Average Runoff Depth = 3.05"
72.72% Pervious = 3.144 ac 27.28% Impervious = 1.179 ac

Summary for Subcatchment 2S: POST-B1

Runoff = 0.91 cfs @ 12.12 hrs, Volume= 0.089 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
3,550	98	Roofs, HSG A
22,530	39	>75% Grass cover, Good, HSG A
9,750	30	Woods, Good, HSG A
35,830	42	Weighted Average
32,280		90.09% Pervious Area
3,550		9.91% Impervious Area

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

Summary for Subcatchment 5S: POST A1

Runoff = 0.16 cfs @ 12.12 hrs, Volume= 0.016 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
5,531	39	>75% Grass cover, Good, HSG A
457	30	Woods, Good, HSG A
388	98	Paved parking, HSG A
6,376	42	Weighted Average
5,988		93.91% Pervious Area
388		6.09% Impervious Area

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

Summary for Subcatchment 6S: POST A2

Runoff = 0.37 cfs @ 12.12 hrs, Volume= 0.036 af, Depth= 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Adj	Description
11,475	39		>75% Grass cover, Good, HSG A
1,064	30		Woods, Good, HSG A
1,938	98		Unconnected roofs, HSG A
14,477	46	42	Weighted Average, UI Adjusted
12,539			86.61% Pervious Area
1,938			13.39% Impervious Area
1,938			100.00% Unconnected

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

Summary for Subcatchment 7S: POST A3

Runoff = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Depth= 5.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
588	39	>75% Grass cover, Good, HSG A
1,068	98	Paved parking, HSG A
1,656	77	Weighted Average
588		35.51% Pervious Area
1,068		64.49% Impervious Area

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

Summary for Subcatchment 9S: POST A4

Runoff = 0.43 cfs @ 12.10 hrs, Volume= 0.033 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
6,040	39	>75% Grass cover, Good, HSG A
1,625	98	Paved parking, HSG A
7,665	52	Weighted Average
6,040		78.80% Pervious Area
1,625		21.20% Impervious Area

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

Summary for Subcatchment 13S: POST A5

Runoff = 0.59 cfs @ 12.09 hrs, Volume= 0.043 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
2,644	39	>75% Grass cover, Good, HSG A
2,168	98	Paved parking, HSG A
661	98	Unconnected roofs, HSG A
5,473	69	Weighted Average
2,644		48.31% Pervious Area
2,829		51.69% Impervious Area
661		23.37% Unconnected

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

Summary for Subcatchment 14S: POST A6

Runoff = 1.54 cfs @ 12.10 hrs, Volume= 0.117 af, Depth= 2.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
2,408	98	Paved parking, HSG A
9,904	39	>75% Grass cover, Good, HSG A
920	80	>75% Grass cover, Good, HSG D
4,110	30	Woods, Good, HSG A
6,262	77	Woods, Good, HSG D
23,604	55	Weighted Average
21,196		89.80% Pervious Area
2,408		10.20% Impervious Area

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

Summary for Subcatchment 21S: POST A8

Runoff = 1.65 cfs @ 12.09 hrs, Volume= 0.123 af, Depth= 5.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
1,428	39	>75% Grass cover, Good, HSG A
3,960	80	>75% Grass cover, Good, HSG D
3,753	98	Paved parking, HSG A
656	98	Unconnected roofs, HSG A
1,294	98	Unconnected roofs, HSG D
11,091	84	Weighted Average
5,388		48.58% Pervious Area
5,703		51.42% Impervious Area
1,950		34.19% Unconnected

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

Summary for Subcatchment 22S: POST A7

Runoff = 0.46 cfs @ 12.09 hrs, Volume= 0.034 af, Depth= 5.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
1,014	39	>75% Grass cover, Good, HSG A
2,273	98	Paved parking, HSG A
3,287	80	Weighted Average
1,014		30.85% Pervious Area
2,273		69.15% Impervious Area

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

Summary for Subcatchment 23S: POST-B2

Runoff = 2.76 cfs @ 12.09 hrs, Volume= 0.200 af, Depth= 4.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
9,971	39	>75% Grass cover, Good, HSG A
247	30	Woods, Good, HSG A
6,536	98	Paved parking, HSG A
6,784	98	Roofs, HSG A
23,538	72	Weighted Average
10,218		43.41% Pervious Area
13,320		56.59% Impervious Area

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

Summary for Subcatchment 24S: POST-B4

Runoff = 0.95 cfs @ 12.09 hrs, Volume= 0.069 af, Depth= 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
1,793	39	>75% Grass cover, Good, HSG A
4,921	80	>75% Grass cover, Good, HSG D
138	30	Woods, Good, HSG A
830	77	Woods, Good, HSG D
650	98	Roofs, HSG A
8,332	71	Weighted Average
7,682		92.20% Pervious Area
650		7.80% Impervious Area

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

Summary for Subcatchment 25S: POST-B3

Runoff = 2.23 cfs @ 12.09 hrs, Volume= 0.162 af, Depth= 4.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
5,059	39	>75% Grass cover, Good, HSG A
3,462	80	>75% Grass cover, Good, HSG D
177	30	Woods, Good, HSG A
422	77	Woods, Good, HSG D
6,064	98	Paved parking, HSG A
2,160	98	Roofs, HSG A
17,344	76	Weighted Average
9,120		52.58% Pervious Area
8,224		47.42% Impervious Area

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

Summary for Subcatchment 26S: POST-B5

Runoff = 2.12 cfs @ 12.10 hrs, Volume= 0.159 af, Depth= 2.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=7.71"

Area (sf)	CN	Description
15,074	39	>75% Grass cover, Good, HSG A
915	80	>75% Grass cover, Good, HSG D
3,920	30	Woods, Good, HSG A
2,348	77	Woods, Good, HSG D
2,439	98	Paved parking, HSG A
4,954	98	Roofs, HSG A
29,650	57	Weighted Average
22,257		75.07% Pervious Area
7,393		24.93% Impervious Area

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

Summary for Pond 3P: DETENTION BASIN

Inflow Area = 1.330 ac, 26.15% Impervious, Inflow Depth = 3.19" for 100-year event
Inflow = 4.59 cfs @ 12.10 hrs, Volume= 0.353 af
Outflow = 0.91 cfs @ 12.57 hrs, Volume= 0.353 af, Atten= 80%, Lag= 28.2 min
Discarded = 0.91 cfs @ 12.57 hrs, Volume= 0.353 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 347.65' @ 12.57 hrs Surf.Area= 3,326 sf Storage= 4,494 cf

Plug-Flow detention time= 41.3 min calculated for 0.353 af (100% of inflow)
Center-of-Mass det. time= 41.2 min (873.4 - 832.2)

Volume	Invert	Avail.Storage	Storage Description
#1	346.00'	14,542 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)
346.00	2,163	220.0	0	0	2,163
347.00	2,853	239.0	2,500	2,500	2,894
348.00	3,600	258.0	3,219	5,719	3,685
349.00	4,404	277.0	3,995	9,715	4,537
350.00	5,264	296.0	4,828	14,542	5,450

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 343.00'
#2	Primary	349.00'	**20.0' long x 16.0' 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=0.91 cfs @ 12.57 hrs HW=347.64' (Free Discharge)
↑**1=Exfiltration** (Controls 0.91 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=346.00' (Free Discharge)
↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 6P: INFIL. B

Inflow Area = 1.810 ac, 37.52% Impervious, Inflow Depth = 3.91" for 100-year event
Inflow = 8.05 cfs @ 12.09 hrs, Volume= 0.590 af
Outflow = 4.66 cfs @ 12.24 hrs, Volume= 0.590 af, Atten= 42%, Lag= 8.8 min
Discarded = 0.71 cfs @ 12.24 hrs, Volume= 0.377 af
Primary = 3.95 cfs @ 12.24 hrs, Volume= 0.213 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.85' @ 12.24 hrs Surf.Area= 0.039 ac Storage= 0.141 af
Flood Elev= 364.70' Surf.Area= 0.039 ac Storage= 0.152 af

Plug-Flow detention time= 36.5 min calculated for 0.590 af (100% of inflow)
Center-of-Mass det. time= 36.5 min (865.4 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	355.00'	0.069 af	**39.50'W x 43.37'L x 6.50'H Field A** 0.256 af Overall - 0.082 af Embedded = 0.173 af x 40.0% Voids
#2A	356.50'	0.082 af	**Cultec R-902HD** x 55 Inside #1 Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap 55 Chambers in 5 Rows Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf
		0.152 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	355.00'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 350.00'
#2	Device 4	360.50'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#3	Device 4	357.00'	**5.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	356.00'	**12.0" Round Culvert** L= 139.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.00' / 355.00' S= 0.0072 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Discarded OutFlow Max=0.71 cfs @ 12.24 hrs HW=360.84' (Free Discharge)
└**1=Exfiltration** (Controls 0.71 cfs)

Primary OutFlow Max=3.84 cfs @ 12.24 hrs HW=360.84' (Free Discharge)
└**4=Culvert** (Passes 3.84 cfs of 5.54 cfs potential flow)
  ├**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.59 cfs @ 1.92 fps)
  └**3=Orifice/Grate** (Orifice Controls 1.25 cfs @ 9.18 fps)

Pond 6P: INFIL. B - Chamber Wizard Field A

Chamber Model = Cultec R-902HD (Cultec Recharger® 902HD)
Effective Size= 69.8"W x 48.0"H => 17.65 sf x 3.67'L = 64.7 cf
Overall Size= 78.0"W x 48.0"H x 4.10'L with 0.44' Overlap
Cap Storage= +2.8 cf x 2 x 5 rows = 27.6 cf

78.0" Wide + 9.0" Spacing = 87.0" C-C Row Spacing

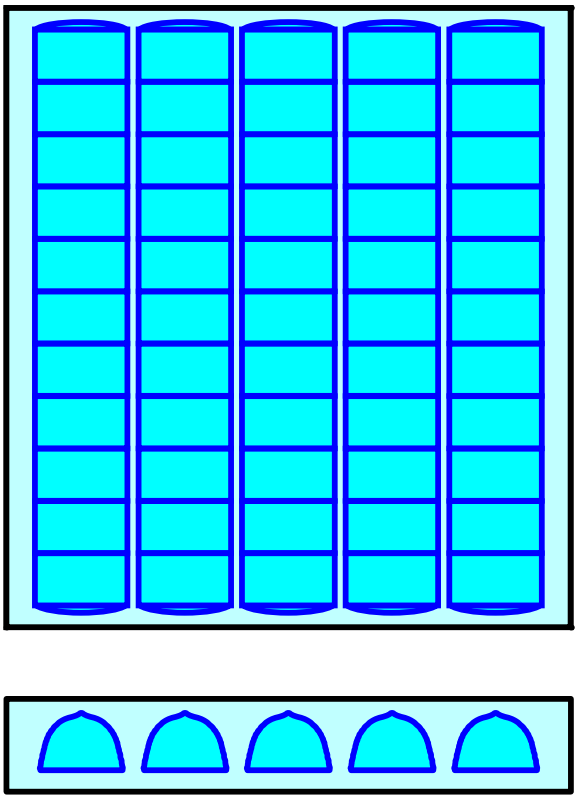
11 Chambers/Row x 3.67' Long +0.52' Cap Length x 2 = 41.37' Row Length +12.0" End Stone x 2 = 43.37' Base Length
5 Rows x 78.0" Wide + 9.0" Spacing x 4 + 24.0" Side Stone x 2 = 39.50' Base Width
18.0" Stone Base + 48.0" Chamber Height + 12.0" Stone Cover = 6.50' Field Height

55 Chambers x 64.7 cf + 2.8 cf Cap Volume x 2 x 5 Rows = 3,588.0 cf Chamber Storage

11,134.4 cf Field - 3,588.0 cf Chambers = 7,546.4 cf Stone x 40.0% Voids = 3,018.5 cf Stone Storage

Chamber Storage + Stone Storage = 6,606.6 cf = 0.152 af
Overall Storage Efficiency = 59.3%
Overall System Size = 43.37' x 39.50' x 6.50'

55 Chambers
412.4 cy Field
279.5 cy Stone



Summary for Pond 8P: CB-2

Inflow Area = 0.038 ac, 64.49% Impervious, Inflow Depth = 5.01" for 100-year event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af
Outflow = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min
Primary = 0.22 cfs @ 12.09 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 27.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.21 cfs @ 12.09 hrs HW=344.29' (Free Discharge)
1=Culvert (Inlet Controls 0.21 cfs @ 1.35 fps)

Summary for Pond 10P: CB-1

Inflow Area = 0.176 ac, 21.20% Impervious, Inflow Depth = 2.28" for 100-year event
Inflow = 0.43 cfs @ 12.10 hrs, Volume= 0.033 af
Outflow = 0.43 cfs @ 12.10 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.10 hrs, Volume= 0.033 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 344.41' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	344.04'	**12.0" Round Culvert** L= 8.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 344.04' / 343.77' S= 0.0338 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.43 cfs @ 12.10 hrs HW=344.41' (Free Discharge)
1=Culvert (Inlet Controls 0.43 cfs @ 1.63 fps)

Summary for Pond 12P: INFIL. A

Inflow Area = 0.214 ac, 28.89% Impervious, Inflow Depth = 2.76" for 100-year event
Inflow = 0.65 cfs @ 12.10 hrs, Volume= 0.049 af
Outflow = 0.13 cfs @ 12.57 hrs, Volume= 0.049 af, Atten= 79%, Lag= 28.3 min
Discarded = 0.13 cfs @ 12.57 hrs, Volume= 0.049 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 345.70' @ 12.57 hrs Surf.Area= 0.009 ac Storage= 0.014 af

Plug-Flow detention time= 35.1 min calculated for 0.049 af (100% of inflow)
Center-of-Mass det. time= 35.0 min (884.6 - 849.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	343.27'	0.007 af	**11.50'W x 34.65'L x 2.71'H Field A** 0.025 af Overall - 0.008 af Embedded = 0.017 af x 40.0% Voids
#2A	343.77'	0.008 af	**Cultec R-180** x 15 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 3 rows
		0.015 af	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	343.27'	**8.270 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 340.00'
#2	Secondary	346.00'	**12.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 346.00' / 345.00' S= 0.0500 '/' Cc= 0.900 n= 0.130, Flow Area= 0.79 sf

Discarded OutFlow Max=0.13 cfs @ 12.57 hrs HW=345.70' (Free Discharge)
1=Exfiltration (Controls 0.13 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=343.27' (Free Discharge)
2=Culvert (Controls 0.00 cfs)

Pond 12P: INFIL. A - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger® 180HD)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 3 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

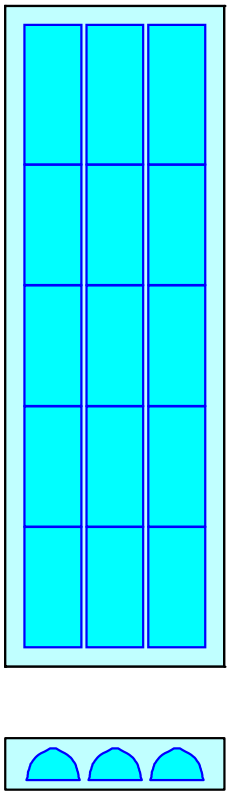
5 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 32.65' Row Length +12.0" End Stone x 2 = 34.65' Base Length
3 Rows x 36.0" Wide + 3.0" Spacing x 2 + 12.0" Side Stone x 2 = 11.50' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

15 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 3 Rows = 336.9 cf Chamber Storage

1,079.2 cf Field - 336.9 cf Chambers = 742.3 cf Stone x 40.0% Voids = 296.9 cf Stone Storage

Chamber Storage + Stone Storage = 633.8 cf = 0.015 af
Overall Storage Efficiency = 58.7%
Overall System Size = 34.65' x 11.50' x 2.71'

15 Chambers
40.0 cy Field
27.5 cy Stone



Summary for Pond 15P: CB-3

Inflow Area = 0.542 ac, 10.20% Impervious, Inflow Depth = 2.59" for 100-year event
Inflow = 1.54 cfs @ 12.10 hrs, Volume= 0.117 af
Outflow = 1.54 cfs @ 12.10 hrs, Volume= 0.117 af, Atten= 0%, Lag= 0.0 min
Primary = 1.54 cfs @ 12.10 hrs, Volume= 0.117 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.86' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.54 cfs @ 12.10 hrs HW=348.86' (Free Discharge)
1=Culvert (Inlet Controls 1.54 cfs @ 2.36 fps)

Summary for Pond 16P: CB-4

Inflow Area = 0.126 ac, 51.69% Impervious, Inflow Depth = 4.10" for 100-year event
Inflow = 0.59 cfs @ 12.09 hrs, Volume= 0.043 af
Outflow = 0.59 cfs @ 12.09 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min
Primary = 0.59 cfs @ 12.09 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 348.53' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	348.09'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 348.09' / 347.79' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.58 cfs @ 12.09 hrs HW=348.53' (Free Discharge)
1=Culvert (Inlet Controls 0.58 cfs @ 1.77 fps)

Summary for Pond 17P: DP4

Inflow Area = 0.998 ac, 30.41% Impervious, Inflow Depth = 3.81" for 100-year event
Inflow = 4.24 cfs @ 12.09 hrs, Volume= 0.317 af
Outflow = 4.24 cfs @ 12.09 hrs, Volume= 0.317 af, Atten= 0%, Lag= 0.0 min
Primary = 4.24 cfs @ 12.09 hrs, Volume= 0.317 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 349.14' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	347.69'	**15.0" Round Culvert** L= 43.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 347.69' / 347.26' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf

Primary OutFlow Max=4.17 cfs @ 12.09 hrs HW=349.11' (Free Discharge)
↑**1=Culvert** (Inlet Controls 4.17 cfs @ 3.40 fps)

Summary for Pond 18P: CB-6

Inflow Area = 0.075 ac, 69.15% Impervious, Inflow Depth = 5.35" for 100-year event
Inflow = 0.46 cfs @ 12.09 hrs, Volume= 0.034 af
Outflow = 0.46 cfs @ 12.09 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min
Primary = 0.46 cfs @ 12.09 hrs, Volume= 0.034 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.27' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.45 cfs @ 12.09 hrs HW=357.27' (Free Discharge)
1=Culvert (Inlet Controls 0.45 cfs @ 1.65 fps)

Summary for Pond 19P: CB-5

Inflow Area = 0.255 ac, 51.42% Impervious, Inflow Depth = 5.82" for 100-year event
Inflow = 1.65 cfs @ 12.09 hrs, Volume= 0.123 af
Outflow = 1.65 cfs @ 12.09 hrs, Volume= 0.123 af, Atten= 0%, Lag= 0.0 min
Primary = 1.65 cfs @ 12.09 hrs, Volume= 0.123 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.70' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.89'	**12.0" Round Culvert** L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.89' / 356.59' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=1.61 cfs @ 12.09 hrs HW=357.69' (Free Discharge)
1=Culvert (Inlet Controls 1.61 cfs @ 2.40 fps)

Summary for Pond 20P: DP7

Inflow Area = 0.330 ac, 55.47% Impervious, Inflow Depth = 5.71" for 100-year event
Inflow = 2.11 cfs @ 12.09 hrs, Volume= 0.157 af
Outflow = 2.11 cfs @ 12.09 hrs, Volume= 0.157 af, Atten= 0%, Lag= 0.0 min
Primary = 2.11 cfs @ 12.09 hrs, Volume= 0.157 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 357.48' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	356.49'	**12.0" Round Culvert** L= 159.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 356.49' / 347.79' S= 0.0547 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.06 cfs @ 12.09 hrs HW=357.46' (Free Discharge)
1=Culvert (Inlet Controls 2.06 cfs @ 2.65 fps)

Summary for Pond 27P: CB-10

Inflow Area = 0.681 ac, 24.93% Impervious, Inflow Depth = 2.80" for 100-year event
Inflow = 2.12 cfs @ 12.10 hrs, Volume= 0.159 af
Outflow = 2.12 cfs @ 12.10 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min
Primary = 2.12 cfs @ 12.10 hrs, Volume= 0.159 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 362.97' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	361.96'	**12.0" Round Culvert** L= 89.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 361.96' / 359.29' S= 0.0300 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.11 cfs @ 12.10 hrs HW=362.96' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.11 cfs @ 2.69 fps)

Summary for Pond 28P: CB-9

Inflow Area = 0.191 ac, 7.80% Impervious, Inflow Depth = 4.33" for 100-year event
Inflow = 0.95 cfs @ 12.09 hrs, Volume= 0.069 af
Outflow = 0.95 cfs @ 12.09 hrs, Volume= 0.069 af, Atten= 0%, Lag= 0.0 min
Primary = 0.95 cfs @ 12.09 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 360.91' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.34'	**12.0" Round Culvert** L= 31.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.34' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.93 cfs @ 12.09 hrs HW=360.91' (Free Discharge)
1=Culvert (Inlet Controls 0.93 cfs @ 2.03 fps)

Summary for Pond 29P: DP13

Inflow Area = 1.130 ac, 45.10% Impervious, Inflow Depth = 4.58" for 100-year event
Inflow = 5.93 cfs @ 12.09 hrs, Volume= 0.431 af
Outflow = 5.93 cfs @ 12.09 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.0 min
Primary = 5.93 cfs @ 12.09 hrs, Volume= 0.431 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.46' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	359.93'	**18.0" Round Culvert** L= 64.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 359.93' / 359.29' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.82 cfs @ 12.09 hrs HW=361.43' (Free Discharge)
1=Culvert (Inlet Controls 5.82 cfs @ 3.29 fps)

Summary for Pond 30P: CB-8

Inflow Area = 0.540 ac, 56.59% Impervious, Inflow Depth = 4.44" for 100-year event
Inflow = 2.76 cfs @ 12.09 hrs, Volume= 0.200 af
Outflow = 2.76 cfs @ 12.09 hrs, Volume= 0.200 af, Atten= 0%, Lag= 0.0 min
Primary = 2.76 cfs @ 12.09 hrs, Volume= 0.200 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.68' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.71 cfs @ 12.09 hrs HW=361.65' (Free Discharge)
1=Culvert (Inlet Controls 2.71 cfs @ 3.45 fps)

Summary for Pond 31P: CB-8

Inflow Area = 0.398 ac, 47.42% Impervious, Inflow Depth = 4.89" for 100-year event
Inflow = 2.23 cfs @ 12.09 hrs, Volume= 0.162 af
Outflow = 2.23 cfs @ 12.09 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min
Primary = 2.23 cfs @ 12.09 hrs, Volume= 0.162 af

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs
Peak Elev= 361.38' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	360.33'	**12.0" Round Culvert** L= 30.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 360.33' / 360.03' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=2.18 cfs @ 12.09 hrs HW=361.36' (Free Discharge)
↑**1=Culvert** (Inlet Controls 2.18 cfs @ 2.77 fps)

Summary for Link 1L: DP-A

Inflow Area = 1.476 ac, 24.16% Impervious, Inflow Depth = 0.13" for 100-year event
Inflow = 0.16 cfs @ 12.12 hrs, Volume= 0.016 af
Primary = 0.16 cfs @ 12.12 hrs, Volume= 0.016 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

Summary for Link 2L: DP-B

Inflow Area = 2.633 ac, 28.89% Impervious, Inflow Depth = 1.38" for 100-year event
Inflow = 4.60 cfs @ 12.24 hrs, Volume= 0.303 af
Primary = 4.60 cfs @ 12.24 hrs, Volume= 0.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.05 hrs

APPENDIX F

Recharge / WQV / TSS Calculations

Morin - Mallard Lane
Bolton, MA

February 28, 2022
5293-M

Sub-surface Infiltration Area A

Stormwater Recharge Calculations

CALCULATIONS

Recharge Volume, Rv:

$R_v = A_C x F$

Hydrologic Soil Group	Impervious Area (Ac) [1]	Target Depth (F)	Recharge Volume (Rv) Ac-feet
A	0.062	0.6	0.003
Total	**0.062**		**0.003**

See INFIL. A subcatchment

Total Recharge Volume Required = 0.003 Ac-ft
Total Recharge Volume Required (Rv) = 135 C.ft
Recharge Vol. Provided (from Infil. Area 1) = 653.0 C.ft
Recharge Vol. is the reported volume below the outlet invert

Required Sediment Forebay vol, Fv:

$F_v = A_C(cu.ft) x 0.1 inch$ of impervious area

[1] Imp. area captured by Infil A, Ap = 0.062 Ac
Required Sediment Forebay vol, Fv= 22 C.ft

Sediment Forebay Volume Provided = 112 C.ft (Chamber volume in isolator row)

REFERENCES

Table 2.3.2: Recharge Target Depth by Hydrologic Soil Group

NRCS Hydrologic Soil Group	Approx. Soil Texture	Target Depth Factor (F)
A	sand	0.6 inch
B	loam	0.35 inch
C	silty loam	0.25 inch
D	clay	0.1 inch

Drawdown Calculations

CALCULATIONS

Proposed Infiltration Area Calculations:

$$Drawdown = \frac{R_V}{(Rawls\ Rate)(Bottom\ Area)}$$

Drawdown Calculations:

Soil Texture: 1 Sand

Bottom Surface Area (A): 398 SF
Rawls Rate: 8.27 in/hr
Total Recharge Volume Required = 135 C.ft
Drawdown: 0.49 hr
Drawdown is less than 72 Hours as Required

REFERENCES

Table 2.3.3: 1982 Rawls Rates

Texture Class	NRCS Hydrologic Soil Group	Infiltration Rate
1 Sand	A	8.27 in/hr
2 Loamy Sand	A	2.41 in/hr
3 Sandy Loam	B	1.02 in/hr
4 Loam	B	0.52 in/hr
5 Silt Loam	C	0.27 in/hr
6 Sandy Clay Loam	C	0.17 in/hr
7 Clay Loam	D	0.09 in/hr
8 Silty Clay Loam	D	0.06 in/hr
9 Sandy Clay	D	0.05 in/hr
10 Silty Clay	D	0.04 in/hr
11 Clay	D	0.02 in/hr

NOTES:

[1] = Refer to Proposed Conditions HydroCAD modeling report

Morin - Mallard Lane
Bolton, MA

February 28, 2022
5293-M

Sub-surface Infiltration Area A

Stormwater Recharge Calculations

CALCULATIONS

Recharge Volume, Rv:

$R_v = A_C x F$

Hydrologic Soil Group	Impervious Area (Ac) [1]	Target Depth (F)	Recharge Volume (Rv) Ac-feet
A	0.318	0.6	0.016
D	0.030	0.1	0.000
Total	**0.348**		**0.016**

See INFIL. A subcatchment

Total Recharge Volume Required = 0.016 Ac-ft
Total Recharge Volume Required (Rv) = 704 C.ft
Recharge Vol. Provided (from Infil. Area 1) = 4,494.0 C.ft
Recharge Vol. is the reported volume below the outlet invert

Required Sediment Forebay vol, Fv:

$F_v = A_C(cu.ft) x 0.1 inch$ of impervious area

[1] Imp. area captured by Infil Basin, Ap = 0.348 Ac
Required Sediment Forebay vol, Fv= 126 C.ft

Sediment Forebay Volume Provided = 251 C.ft

REFERENCES

Table 2.3.2: Recharge Target Depth by Hydrologic Soil Group

NRCS Hydrologic Soil Group	Approx. Soil Texture	Target Depth Factor (F)
A	sand	0.6 inch
B	loam	0.35 inch
C	silty loam	0.25 inch
D	clay	0.1 inch

Drawdown Calculations

CALCULATIONS

Proposed Infiltration Area Calculations:

$$Drawdown = \frac{R_V}{(Rawls\ Rate)(Bottom\ Area)}$$

Drawdown Calculations:

Soil Texture: 1 Sand

Bottom Surface Area (A): 2,163 SF
Rawls Rate: 8.27 in/hr
Total Recharge Volume Required = 704 C.ft
Drawdown: 0.47 hr
Drawdown is less than 72 Hours as Required

REFERENCES

Table 2.3.3: 1982 Rawls Rates

Texture Class	NRCS Hydrologic Soil Group	Infiltration Rate
1 Sand	A	8.27 in/hr
2 Loamy Sand	A	2.41 in/hr
3 Sandy Loam	B	1.02 in/hr
4 Loam	B	0.52 in/hr
5 Silt Loam	C	0.27 in/hr
6 Sandy Clay Loam	C	0.17 in/hr
7 Clay Loam	D	0.09 in/hr
8 Silty Clay Loam	D	0.06 in/hr
9 Sandy Clay	D	0.05 in/hr
10 Silty Clay	D	0.04 in/hr
11 Clay	D	0.02 in/hr

NOTES:

[1] = Refer to Proposed Conditions HydroCAD modeling report

Morin - Mallard Lane
Bolton, MA

February 28, 2022
5293-M

Sub-surface Infiltration Area B

Stormwater Recharge Calculations

CALCULATIONS

Recharge Volume, Rv:

$R_v = A_C x F$

Hydrologic Soil Group	Impervious Area (Ac) [1]	Target Depth (F)	Recharge Volume (Rv) Ac-feet
A	0.630	0.6	0.031
D	0.050	0.1	0.000
Total	**0.679**		**0.032**

*See INFIL. B subcatchment

Total Recharge Volume Required = 0.032 Ac-ft
Total Recharge Volume Required (Rv) = 1,389 C.ft
Recharge Vol. Provided (from Infil. Area 1) = 1,698.0 **C.ft (Storage voume below oriface)**
Recharge Vol. is the reported volume below the outlet invert

Required Sediment Forebay vol, Fv:

$F_v = A_C(cu.ft) x 0.1 inch$ of impervious area

[1] Imp. area captured by ponds, Ap = 0.679 Ac
Required Sediment Forebay vol, Fv= 247 C.ft

Sediment Forebay Volume Provided = 718 **C.ft (Chamber volume in isolator row)**

REFERENCES

Table 2.3.2: Recharge Target Depth by Hydrologic Soil Group

NRCS Hydrologic Soil Group	Approx. Soil Texture	Target Depth Factor (F)
A	sand	0.6 inch
B	loam	0.35 inch
C	silty loam	0.25 inch
D	clay	0.1 inch

Drawdown Calculations

CALCULATIONS

Proposed Infiltration Area Calculations:

$$Drawdown = \frac{R_V}{(Rawls\ Rate)(Bottom\ Area)}$$

Drawdown Calculations:

Soil Texture: 1 Sand

Bottom Surface Area (A): 1,713 SF
Rawls Rate: 8.27 in/hr
Total Recharge Volume Required = 1,389 C.ft
Drawdown: 1.18 hr
Drawdown is less than 72 Hours as Required

REFERENCES

Table 2.3.3: 1982 Rawls Rates

Texture Class	NRCS Hydrologic Soil Group	Infiltration Rate
1 Sand	A	8.27 in/hr
2 Loamy Sand	A	2.41 in/hr
3 Sandy Loam	B	1.02 in/hr
4 Loam	B	0.52 in/hr
5 Silt Loam	C	0.27 in/hr
6 Sandy Clay Loam	C	0.17 in/hr
7 Clay Loam	D	0.09 in/hr
8 Silty Clay Loam	D	0.06 in/hr
9 Sandy Clay	D	0.05 in/hr
10 Silty Clay	D	0.04 in/hr
11 Clay	D	0.02 in/hr

NOTES:

[1] = Refer to Proposed Conditions HydroCAD modeling report

Morin - Mallard Lane
Bolton, MA

February 28, 2022
5293-M

Adjusted Recharge/WQV Calcs

Stormwater Recharge Calculations

Capture Area Adjustment, Rvadj:

$$R_v adj = \frac{A_t}{A_p} x R_v$$

Imp. area captured by ponds, Ap =	1.0875	Ac
Total impervious area on site, AT =	1.18	Ac
Recharge volume required, Rv =	2,565	C.ft
Capture Rate=	**92%**	OK
Capture Area Adjustment Factor=	**1.08**	
Adjusted Recharge Volume Required Rvadj =	**2,779**	**C.ft**
Total Recharge Volume Provided =	8,799.0	**C.ft**

NOTES:

Water Quality Calculations

CALCULATIONS

Water Quality Calculation:

$$V_{WQ} = D_{WQ}(ft) x\ A_T(ft^2)$$

Water Quality Depth =	1	in
Water Quality Depth , DwQ =	**0.08**	**ft.**
Total impervious area on site, AT =	1.178	Ac.
AT =	**51,309**	**ft^2**
Required Water Quality Volume, VwQ =	**4,276**	**C.ft.**

REFERENCES

1 inch depth
Zone II discharges
IWPA discharges
Critical Area
Runoff from LUHPPL
Infiltration rate >2.4 inches/hour
1/2 inch depth
Discharge to other ares
8 inch
9 inch
10 inch
11 inch

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Total TSS Removal

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Infiltration Basin	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**

Total TSS Removal = 85%

Project: **Mallard Lane**
Prepared By: **RPV**
Date: **1-Dec-21**

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Total TSS Removal

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Subsurface Infiltration Structure	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**
	0.00	**0.15**	**0.00**	**0.15**

Total TSS Removal = **85%**

Project: **Mallard Lane**
Prepared By: **RPV**
Date: **1-Dec-21**

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Pre-Treatment

TSS Removal Calculation Worksheet

B BMP[1]	C TSS Removal Rate[1]	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Sediment Forebay	**0.25**	**0.75**	**0.19**	**0.56**
	0.00	**0.56**	**0.00**	**0.56**
	0.00	**0.56**	**0.00**	**0.56**
	0.00	**0.56**	**0.00**	**0.56**

Total TSS Removal = 44%

Project: **Mallard Lane**
Prepared By: **RPV**
Date: **1-Dec-21**

*Equals remaining load from previous BMP (E) which enters the BMP

APPENDIX G

Stormwater Operation & Maintenance Manual

STORMWATER OPERATION & MAINTENANCE MANUAL

Mallard Lane

BOLTON, MASSACHUSETTS

Prepared For: JAMES MORIN
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BOLTON, MA

Prepared By: DILLIS & ROY CIVIL DESIGN GROUP, INC
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LUNENBURG, MA 01462

February 28, 2022
December 1st, 2021
5293

TABLE OF CONTENTS:

1.0 Project Narrative

1.1 Proposed Stormwater Management System

Runoff from the proposed development will be conveyed and treated through a combination of Best Management Practices (BMP's). The following is a brief discussion of each conveyance and treatment BMP proposed.

Deep Sump Hooded Catch Basins

Deep sump hooded catch basins are proposed to convey the runoff from the proposed roadway to the subsurface infiltration system. These catch basins will discharge to manholes and conventional storm drains.

Infiltration Basin

An infiltration basin is proposed at the of the site. The basin which will be equipped with a sediment forebay, will collect the runoff from the roofs and pavement after pretreatment in the deep sump hooded catch basins. The infiltration basin will recharge the runoff from the 100-year storm which an emergency overflow weir for larger storm events.

Subsurface Infiltration System

Subsurface infiltration systems are included at the entrance of the site and under the cul-de-sac. Cultec prefabricated chambers, models R-180HD and R-902HD, will be installed to collect the runoff from the roofs and pavement after pretreatment in the deep sump hooded catch basins. The infiltration systems will provide groundwater recharge as well.

1.2 Operation & Maintenance Tasks

The following activities should be performed routinely to allow for proper functioning of the stormwater system. The following are guidelines referring to each major component of the stormwater management system.

1.2.1 *Street Sweeping*

Street sweeping should be preformed at least semiannually. For most effective results, sweeping should be preformed by a vacuum style truck in the early spring before spring rain events can wash silt and sediment into the stormwater system. Silt and sediment should be disposed of in accordance with local, state and federal guidelines for hazardous waste.

1.2.2 *Drain Manholes*

Manholes shall be inspected semi-annually for signs of wear, settling, cracking or other fatigue. Manhole casting should be inspected for signs of root intrusion, or significant water infiltration. Weirs shall be inspected for signs of cracking or other fatigue. Manhole sumps should be checked for silt /sediment buildup and cleaned as necessary. Cleaning should be performed by a vacuum truck. Manholes should be resealed as required and outlets should be inspected incidentally with all structure inspections.

1.2.3 *Storm Drain Lines*

Storm drainage inlets and outlets should be inspected incidentally with all structure inspections. Evidence of debris intrusion or excessive siltation or sedimentation could result in the need to clean a storm drain line. Flushing or jetting should be performed as required. All flushing and jetting should be performed in the direction away from any outlet devices. A vacuum truck should be used at the opposite end of the flushing or jetting to remove any silt or sediment that is cleaned from the storm drain.

1.2.4 *Deep Sump Catch Basins*

Deep sump catch basins shall be inspected at least semi-annually for signs of wear, settling, cracking or other fatigue. Catch basin castings should be inspected for signs of root intrusion, or significant water infiltration. Catch basin sump should be check for silt/sediment buildup and cleaned as necessary. Cleaning should be performed by a vacuum truck. Catch basins should be resealed as required and outlets should be inspected incidentally with all structure inspections.

1.2.5 *Subsurface Infiltration Systems*

The subsurface infiltration systems should be monitored and maintained regularly to ensure no obstructions in the systems are present. Any depressions noticed in the areas could indicate that the system has collapsed and should be inspected immediately. The systems are equipped with inspection ports to monitor the buildup of sedimentation. If the depth of sedimentation is in excess of the manufacturer's guidelines, the systems will need to be cleaned out with high pressure water. The high-pressure water should be used on one end and a vacuum truck will be used on the opposite end to remove any silt or sediment that is cleaned from the chamber. Other maintenance will include checking the inlets and outlet for debris, survey the surrounding area for depressions and confirm no unauthorized modifications have been performed to the system. See Appendix A for the Cultec Operation and Maintenance Guidelines.

1.2.6 *Infiltration Basin*

The infiltration basis should be monitored and maintained regularly to ensure its proper functionality. Debris should be removed, and the bottom and insides slopes of the basin mowed per the schedule in the next section. The stone riprap inlet and emergency overflow weir should be inspected for signs of scour, erosion or settling. Excessive silt should be removed form the stone and any areas that have settled should be repaired.

The sediment forebay should be inspected yearly. The silt should be removed once the silt has been deposited such that the capacity of the forebay has been reduced by 1.3.

1.3 O&M Schedule

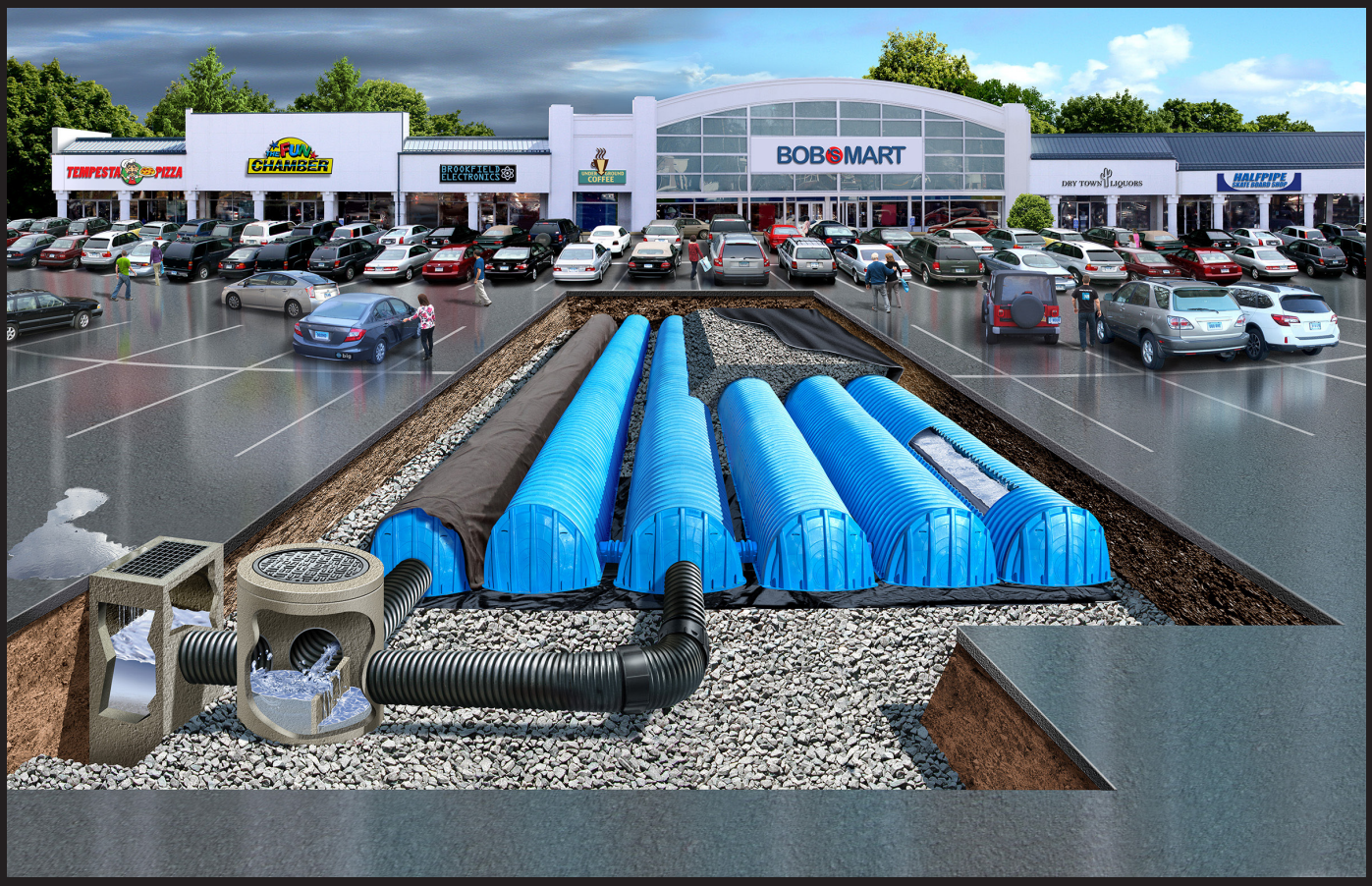
	O&M Task	Monthly	Quarterly	Spring	Fall	2-years	As-required
1.	**Street Sweeping**			**x**	**x**		
2.	**Drain Manholes**						
	Inspect Rims			**x**	**x**		
	Inspect inside/inlet and outlet pipes			**x**	**x**		
	Remove sediment						**x**
3.	**Storm drain Lines**						
	Inspection			**x**	**x**		
	Clean						**x**
4.	**Catch Basins**						
	Inspect Rims			**x**	**x**		
	Inspect inside/inlet and outlet pipes			**x**	**x**		
	Remove sediment						**x**
5.	**Subsurface Infiltration Systems**	Inspected twice per year per the MSH (Refer to Appendix A & E)					
6.	**Infiltration Basin**						
	Inspect			**x**			
	Remove Debris			**x**			**x**
	Mow bottom and inside slopes			**x**	**x**		
	Remove Silt from forebay						**x**
	Repair riprap						**x**

APPENDIX A

Cultec Operation & Maintenance Manual

CONTACTOR® & RECHARGER®

STORMWATER MANAGEMENT SOLUTIONS



OPERATION & MAINTENANCE GUIDELINES

FOR CULTEC STORMWATER MANAGEMENT SYSTEMS

CULTEC®

Published by
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The drawings, photographs and illustrations shown in this document are for illustrative purposes only and are not necessarily to scale.
Actual designs may vary.

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U.S. Patents 6,129,482; 6,322,288; 6,854,925; 7,226,241; 7,806,627; 8,366,346; 8,425,148; U.S. Designs D613,819; D638,095; D668,318; Canadian Patent 2,450,565; 2,591,255; Canadian Designs 129144; 135983; 159073; 160977; and/or other U.S. or Foreign Patent(s) or Patent(s) Pending.

Contact Information:
For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 202, or e-mail us at custservice@cultec.com.

For technical support, please call (203)775-4416 ext. 203 or e-mail tech@cultec.com.

Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

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January 2020

These instructions are for single-layer traffic applications only. For multi-layer applications, contact CULTEC.
All illustrations and photos shown herein are examples of typical situations. Be sure to follow the engineer's drawings.
Actual designs may vary.

This manual contains guidelines recommended by CULTEC, Inc. and may be used in conjunction with, but not to supersede, local regulations or regulatory authorities. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Introduction

The CULTEC Subsurface Stormwater Management System is a high-density polyethylene (HDPE) chamber system arranged in parallel rows surrounded by washed stone. The CULTEC chambers create arch-shaped voids within the washed stone to provide stormwater detention, retention, infiltration, and reclamation. Filter fabric is placed between the native soil and stone interface to prevent the intrusion of fines into the system. In order to minimize the amount of sediment which may enter the CULTEC system, a sediment collection device (stormwater pretreatment device) is recommended upstream from the CULTEC chamber system. Examples of pretreatment devices include, but are not limited to, an appropriately sized catch basin with sump, pretreatment catchment device, oil grit separator, or baffled distribution box. Manufactured pretreatment devices may also be used in accordance with CULTEC chambers. Installation, operation, and maintenance of these devices shall be in accordance with manufacturer's recommendations. Almost all of the sediment entering the stormwater management system will be collected within the pretreatment device.

Best Management Practices allow for the maintenance of the preliminary collection systems prior to feeding the CULTEC chambers. The pretreatment structures shall be inspected for any debris that will restrict inlet flow rates. Outfall structures, if any, such as outlet control must also be inspected for any obstructions that would restrict outlet flow rates. OSHA Guidelines must be followed when inspecting or cleaning any structure.

Operation and Maintenance Requirements

I. Operation

CULTEC stormwater management systems shall be operated to receive only stormwater run-off in accordance with applicable local regulations. CULTEC subsurface stormwater management chambers operate at peak performance when installed in series with pretreatment. Pretreatment of suspended solids is superior to treatment of solids once they have been introduced into the system. The use of pretreatment is adequate as long as the structure is maintained and the site remains stable with finished impervious surfaces such as parking lots, walkways, and pervious areas are properly maintained. If there is to be an unstable condition, such as improvements to buildings or parking areas, all proper silt control measures shall be implemented according to local regulations.

II. Inspection and Maintenance Options

A. The CULTEC system may be equipped with an inspection port located on the inlet row. The inspection port is a circular cast box placed in a rectangular concrete collar. When the lid is removed, a 6-inch (150 mm) pipe with a screw-in plug will be exposed. Remove the plug. This will provide access to the CULTEC Chamber row below. From the surface, through this access, the sediment may be measured at this location. A stadia rod may be used to measure the depth of sediment if any in this row. If the depth of sediment is in excess of 3 inches (76 mm), then this row should be cleaned with high pressure water through a culvert cleaning nozzle. This would be carried out through an upstream manhole or through the CULTEC StormFilter Unit (or other pretreatment device). CCTV inspection of this row can be deployed through this access port to deter mine if any sediment has accumulated in the inlet row.

B. If the CULTEC bed is not equipped with an inspection port, then access to the inlet row will be through an upstream manhole or the CULTEC StormFilter.

1. Manhole Access
This inspection should only be carried out by persons trained in confined space entry and sewer inspection services. After the manhole cover has been removed a gas detector must be lowered into the manhole to ensure that there are not high concentrations of toxic gases present. The inspector should be lowered into the manhole with the proper safety equipment as per OSHA requirements. The inspector may be able to observe sediment from this location. If this is not possible, the inspector will need to deploy a CCTV robot to permit viewing of the sediment.

2. StormFilter Access
Remove the manhole cover to allow access to the unit. Typically a 30-inch (750 mm) pipe is used as a riser from the StormFilter to the surface. As in the case with manhole access, this access point requires a technician trained in confined space entry with proper gas detection equipment. This individual must be equipped with the proper safety equipment for entry into the StormFilter. The technician will be lowered onto the StormFilter unit. The hatch on the unit must be removed. Inside the unit are two filters which may be removed according to StormFilter maintenance guidelines. Once these filters are removed the inspector can enter the StormFilter unit to launch the CCTV camera robot.

C. The inlet row of the CULTEC system is placed on a polyethylene liner to prevent scouring of the washed stone beneath this row. This also facilitates the flushing of this row with high pressure water through a culvert cleaning nozzle. The nozzle is deployed through a manhole or the StormFilter and extended to the end of the row. The water is turned on and the inlet row is back-flushed into the manhole or StormFilter. This water is to be removed from the manhole or StormFilter using a vacuum truck.

III. Maintenance Guidelines

The following guidelines shall be adhered to for the operation and maintenance of the CULTEC stormwater management system:

A. The owner shall keep a maintenance log which shall include details of any events which would have an effect on the system's operational capacity.

B. The operation and maintenance procedure shall be reviewed periodically and changed to meet site conditions.

C. Maintenance of the stormwater management system shall be performed by qualified workers and shall follow applicable occupational health and safety requirements.

D. Debris removed from the stormwater management system shall be disposed of in accordance with applicable laws and regulations.

IV. Suggested Maintenance Schedules

A. Minor Maintenance
The following suggested schedule shall be followed for routine maintenance during the regular operation of the stormwater system:

Frequency	Action
Monthly in first year	Check inlets and outlets for clogging and remove any debris, as required.
Spring and Fall	Check inlets and outlets for clogging and remove any debris, as required.
One year after commissioning and every third year following	Check inlets and outlets for clogging and remove any debris, as required.

B. Major Maintenance
The following suggested maintenance schedule shall be followed to maintain the performance of the CULTEC stormwater management chambers. Additional work may be necessary due to insufficient performance and other issues that might be found during the inspection of the stormwater management chambers. (See table on next page)

	Frequency	Action
Inlets and Outlets	Every 3 years	• Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
	Spring and Fall	• Check inlet and outlets for clogging and remove any debris as required.
CULTEC Stormwater Chambers	2 years after commissioning	• Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
	9 years after commissioning every 9 years following	• Clean stormwater management chambers and feed connectors of any debris. • Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. • Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
	45 years after commissioning	• Clean stormwater management chambers and feed connectors of any debris. • Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. • Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. • Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. • Attain the appropriate approvals as required. • Establish a new operation and maintenance schedule.
Surrounding Site	Monthly in 1st year	• Check for depressions in areas over and surrounding the stormwater management system.
	Spring and Fall	• Check for depressions in areas over and surrounding the stormwater management system.
	Yearly	• Confirm that no unauthorized modifications have been performed to the site.

For additional information concerning the maintenance of CULTEC Subsurface Stormwater Management Chambers, please contact CULTEC, Inc. at 1-800-428-5832.

WQMP
Operation & Maintenance (O&M) Plan

Project Name:_____

Prepared for:

Project Name: _____

Address:_____

City, State Zip:_____

Prepared on:

Date:_____

This O&M Plan describes the designated responsible party for implementation of this WQMP, including: operation and maintenance of all the structural BMP(s), conducting the training/educational program and duties, and any other necessary activities. The O&M Plan includes detailed inspection and maintenance requirements for all structural BMPs, including copies of any maintenance contract agreements, manufacturer's maintenance requirements, permits, etc.

8.1.1 Project Information

Project name	
Address	
City, State Zip	
Site size	
List of structural BMPs, number of each	
Other notes	

8.1.2 Responsible Party

The responsible party for implementation of this WQMP is:

Name of Person or HOA Property Manager	
Address	
City, State Zip	
Phone number	
24-Hour Emergency Contact number	
Email	

8.1.3 Record Keeping

Parties responsible for the O&M plan shall retain records for at least 5 years.

All training and educational activities and BMP operation and maintenance shall be documented to verify compliance with this O&M Plan. A sample Training Log and Inspection and Maintenance Log are included in this document.

8.1.4 Electronic Data Submittal

This document along with the Site Plan and Attachments shall be provided in PDF format. AutoCAD files and/or GIS coordinates of BMPs shall also be submitted to the City.

Appendix ____

BMP SITE PLAN

Site plan is preferred on minimum 11” by 17” colored sheets, as long as legible.

BMP OPERATION & MAINTENANCE LOG

Project Name: _____

Today's Date: _____

Name of Person Performing Activity (Printed): _____

Signature: _____

BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Minor Maintenance

Frequency		Action
Monthly in first year		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Month 1	Date:	
□ Month 2	Date:	
□ Month 3	Date:	
□ Month 4	Date	
□ Month 5	Date:	
□ Month 6	Date:	
□ Month 7	Date:	
□ Month 8	Date:	
□ Month 9	Date:	
□ Month 10	Date:	
□ Month 11	Date:	
□ Month 12	Date:	
Spring and Fall		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
□ Spring	Date:	
□ Fall	Date:	
One year after commissioning and every third year following		Check inlets and outlets for clogging and remove any debris, as required.
		Notes
□ Year 1	Date:	
□ Year 4	Date:	
□ Year 7	Date:	
□ Year 10	Date:	
□ Year 13	Date:	
□ Year 16	Date:	
□ Year 19	Date:	
□ Year 22	Date:	

Major Maintenance

	Frequency		Action
Inlets and Outlets	**Every 3 years**		Obtain documentation that the inlets, outlets and vents have been cleaned and will function as intended.
			Notes
	□ Year 1	Date:	
	□ Year 4	Date:	
	□ Year 7	Date:	
	□ Year 10	Date:	
	□ Year 13	Date:	
	□ Year 16	Date:	
	□ Year 19	Date:	
	□ Year 22	Date:	
	Spring and Fall		Check inlet and outlets for clogging and remove any debris, as required.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
CULTEC Stormwater Chambers	**2 years after commissioning**		□ Inspect the interior of the stormwater management chambers through inspection port for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors will function as anticipated.
			Notes
	□ Year 2	Date:	

Major Maintenance

	Frequency		Action
CULTEC Stormwater Chambers	**9 years after commissioning every 9 years following**		□ Clean stormwater management chambers and feed connectors of any debris. □ Inspect the interior of the stormwater management structures for deficiencies using CCTV or comparable technique. □ Obtain documentation that the stormwater management chambers and feed connectors have been cleaned and will function as intended.
			Notes
	□ Year 9	Date:	
	□ Year 18	Date:	
	□ Year 27	Date:	
	□ Year 36	Date:	
	45 years after commissioning		□ Clean stormwater management chambers and feed connectors of any debris. □ Determine the remaining life expectancy of the stormwater management chambers and recommended schedule and actions to rehabilitate the stormwater management chambers as required. □ Inspect the interior of the stormwater management chambers for deficiencies using CCTV or comparable technique. □ Replace or restore the stormwater management chambers in accordance with the schedule determined at the 45-year inspection. □ Attain the appropriate approvals as required. □ Establish a new operation and maintenance schedule.
			Notes
	□ Year 45	Date:	

Major Maintenance

	Frequency		Action
Surrounding Site	**Monthly in 1st year**		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Month 1	Date:	
	□ Month 2	Date:	
	□ Month 3	Date:	
	□ Month 4	Date:	
	□ Month 5	Date:	
	□ Month 6	Date:	
	□ Month 7	Date:	
	□ Month 8	Date:	
	□ Month 9	Date:	
	□ Month 10	Date:	
	□ Month 11	Date:	
	□ Month 12	Date:	
	Spring and Fall		□ Check for depressions in areas over and surrounding the stormwater management system.
			Notes
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	□ Spring	Date:	
	□ Fall	Date:	
	Yearly		□ Confirm that no unauthorized modifications have been performed to the site.
			Notes
	□ Year 1	Date:	
	□ Year 2	Date:	
	□ Year 3	Date:	
	□ Year 4	Date:	
	□ Year 5	Date:	
	□ Year 6	Date:	
	□ Year 7	Date:	

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RETENTION • DETENTION • INFILTRATION • WATER QUALITY

APPENDIX B

Stormwater Management System Owners/Operators

1.	Stormwater Management System Owners:	To be determined
2.	Current and future operators:	To be determined
3.	Emergency contact information:	To be determined
4.	Change of trustee:	To be determined
5.	Financial Responsible Party:	To be determined
6.	Routine Maintenance:	To be determined
7.	O&M activities:	To be determined
8.	Record keeping	To be determined

APPENDIX H

Long Term Pollution Prevention Plan

LONG-TERM POLLUTION PREVENTION PLAN

Mallard Lane

BOLTON, MASSACHUSETTS

Prepared For: JAMES MORIN
307 CENTRAL STREET, APT. 331
BOLTON, MA

Prepared By: DILLIS & ROY CIVIL DESIGN GROUP, INC
1 MAIN STREET, SUITE 1
LUNENBURG, MA 01462

Rev. February 28, 2022
December 1st, 2021
5293

1.0 Summary

This Long-Term Pollution Prevention Plan (LTPPP) has been prepared by Dillis & Roy Civil Design Group, Inc. pursuant to the Massachusetts Stormwater Regulations. The proposed project includes the development of 11 age restricted homes with an associated road and cul-de-sac. The work will reduce the stormwater runoff and improve stormwater treatment through the installation of stormwater BMP's.

Care has been taken to lay out the proposed site in a manner that works with the existing topography. The stormwater management system has been designed in accordance with the Massachusetts Stormwater Regulations to provide pretreatment of the stormwater prior to discharge.

2.0 Spill Prevention Plan

No hazardous materials other than normal cleaning items are expected to be stored on site after the construction period has ended.

It is expected that normal DEP notification procedures would be triggered for major spills such as heating oil or propane and natural gas leaks.

3.0 Stormwater System O&M

A Stormwater Operation & Maintenance plan has been prepared for the proposed stormwater management system. Refer to this document for details pertaining to the required inspections, routine maintenance and operation details including erosion stabilization.

4.0 Fertilizers, herbicides and pesticides

Application of fertilizer, herbicides and pesticides shall be performed in a manner consistent with the industry standards for the application.

No application of chemicals is to be performed within the stormwater management areas on the site.

5.0 Snow/Salt Management

5.1 Snow Plowing

It is expected that the site will be plowed by town or private personnel. Snow storage will be as far from the wetland resource area to the maximum extent practical.

5.2 Salt/Sand Usage

It is expected that sanding and salting will be performed on an infrequent basis during times when unusually icy conditions persist for periods of time.

5.3 Street Sweeping

The Stormwater Operation & Maintenance Plan calls for the proposed road to be swept in the spring, after the threat of winter precipitation has passed, and in the fall.

6.0 Waste Management

6.1 Solid Waste

A dumpster will be located on the site during construction. Each house will have their own trash containers post construction. These areas will be the primary area for the on-site storage of solid waste prior to pick-up by a waste management company.