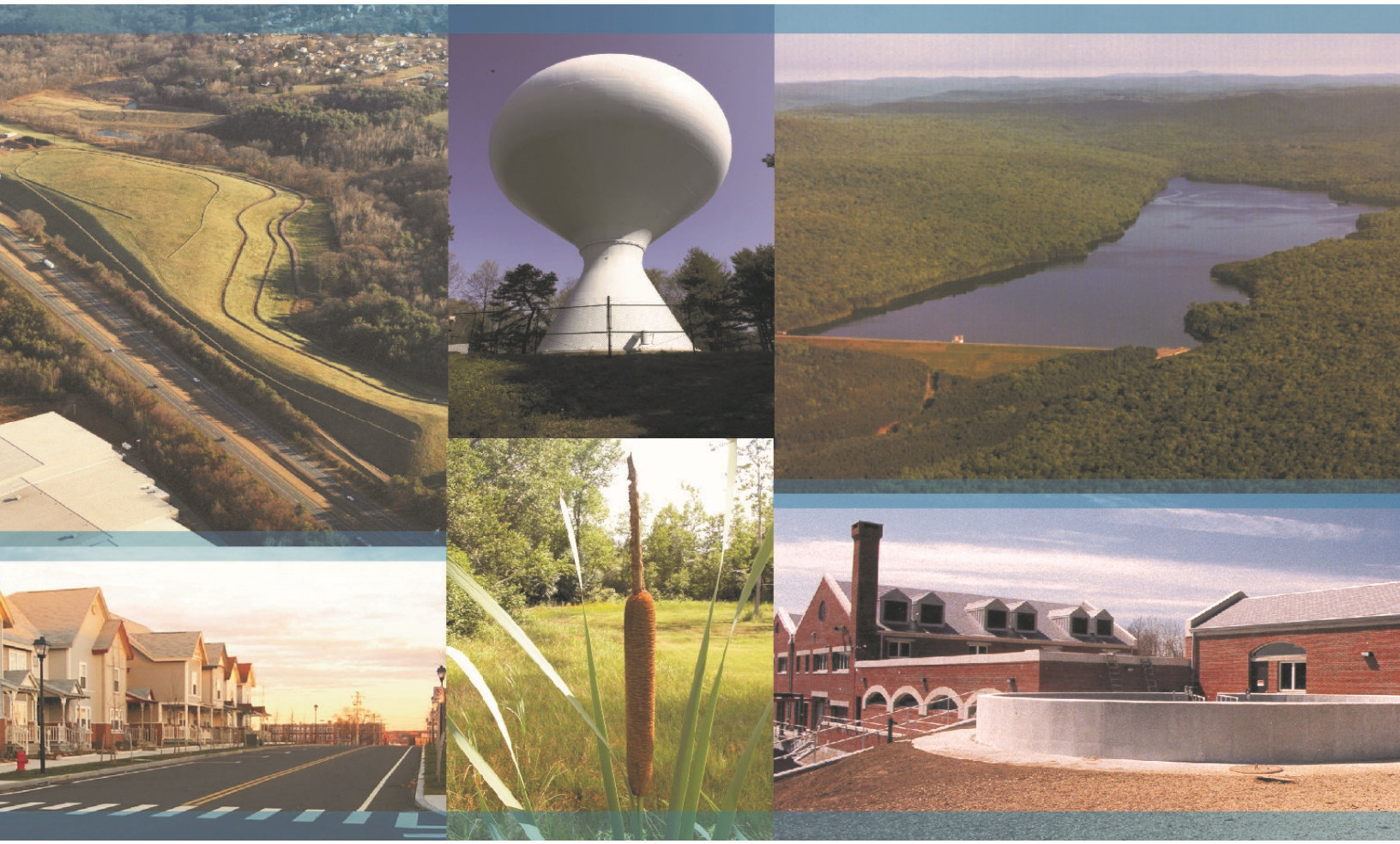

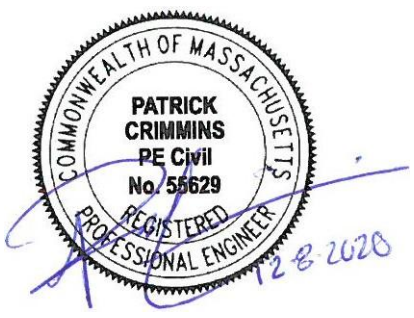

Shingle Mill Multi-Family Development
75 - 79 Pond Street
Rockland, Massachusetts 02370

STORMWATER MANAGEMENT REPORT

Jones Street Residential
100 High Street, Suite 2500
Boston, Massachusetts 02110

July 13, 2020

Last Revised: December 8, 2020

List of Figures

Appendices

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

Checklist for Stormwater Report

A. Introduction

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

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

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

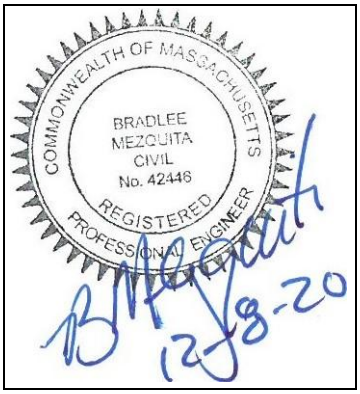
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Signature and Date

Checklist

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

☒ New development

☐ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic 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.

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[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.

Project Description

The proposed project is located on a parcel at 0 Pond Street in Rockland, Massachusetts. The existing site is mostly wetlands that nearly surround an undeveloped, partially cleared upland area.The proposed project is to construct two new apartment buildings with their associated parking lot, walkways, landscaping, utilities, and stormwater management system. This project is being filed under the Chapter 40B Comprehensive Permit Projects and will follow all Massachusetts Stormwater Management Standards.

The proposed development consists of two apartment buildings, a community building, and recreational open space areas. In addition to these new structures, associated access drives, parking areas, walkways, utilities, and drainage systems will be installed throughout the site. These changes increase the overall impervious area found at the site. However, the proposed drainage system has been designed to capture the previously uncontrolled stormwater runoff and direct flows to storage and infiltration facilities, which results in a reduction of the peak rate of runoff. Furthermore, with the addition of the deep sump catch basins with oil/gas hoods, gravel wetland and an infiltration facility the runoff from the impervious areas will be treated appropriately prior to discharge.

Section 1
Compliance with Stormwater Management Standards

The proposed project is located on a parcel at 75 - 79 Pond Street in Rockland, Massachusetts. The existing site is mostly wetlands that nearly surround an undeveloped, partially cleared upland area. As part of this drainage analysis, an in-depth review of the subject site for conformance with the Massachusetts Department of Environmental Protection's Stormwater Management Standards has been performed. The project is not considered a redevelopment project (as defined in Standard 7) and is therefore required to meet all of the Massachusetts Stormwater Management Standards. The following is a summary of our findings relative to our review of each of the standards.

Standard 1: No New Untreated Discharges

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

The stormwater shall be treated prior to release with deep sump catch basins with hoods, gravel wetland, and an infiltration facility with proprietary separators for pre-treatment. The deep sump will provide an area for sediment to settle out and the hood will provide oil and gas separation. Stormwater being directed to the infiltration system flows through a proprietary separator for pre-treatment prior to infiltrating. Outlets of the infiltration facilities have been designed to reduce erosion and eliminate scouring within the wetland areas. The gravel wetland is designed with a wetland soil mix and will be vegetated to clean stormwater prior to being discharged. A rip rap apron shall be installed at each discharge point. The rip rap apron slows down the velocity and therefore reduces scour.

Standard 2: Peak Rate Attenuation

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

The existing and proposed site conditions were analyzed for the 2, 10, 25 and 100-year 24-hour storm events using the methodology discussed in Section 2. Due to the introduction of stormwater being captured, controlled, attenuated, and infiltrated there is no increase in peak discharge rates for all storm events analyzed (refer to Table 1.2), even though there is an increase in the overall impervious area on site.

To analyze the pre- and post-development conditions a single discharge point of analysis (PA-1) was determined. The pre- and post-development watersheds, the point of analysis, and longest flow paths are depicted on the plans entitled "Pre-Development Watershed Plan" (Sheet C-801) and "Post- Development Watershed Plan" (Sheet C-802). The following table summarizes and compares the pre- and post-development peak runoff rates for the 2-year, 10-year, 25-year and 100-year storm events at the point of analysis.

Table 1.2 – Comparison of Peak Flow Rates & Total Volume						
	Existing Conditions		Proposed Conditions		Net Change	
Storm Frequency	Peak Runoff (CFS)	Total Volume (CF)	Peak Runoff (CFS)	Total Volume (CF)	Peak Runoff (CFS)	Total Volume (CF)
2-Year	16.06	143,234	14.12	142,229	-1.94	-1,005
10-Year	32.35	280,070	29.06	279,409	-3.29	-661
25-Year	45.95	395,550	41.02	394,368	-4.93	-1,182
100-Year	74.10	640,341	66.19	637,014	-7.91	-3,327

As depicted in above table, the post-development peak runoff rates are less than the pre-development rates. The overall time span used for the calculations is 5 - 48 hours to demonstrate that the overall runoff volumes are not increased and that the Gravel Wetland is fully drained within 48 hours.

The closed drainage system was sized using the 25-year storm event and as designed can handle the design flow as calculated, as well as maintaining a design velocity of between 2.0 feet per second (fps) and 10.0 fps. Two feet per second is considered "self-cleansing velocity" and will prevent the pipes from accumulating sediment. Ten feet per second is considered a safe maximum velocity, to reduce scouring of the pipes.

Standard 3: Recharge

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

Standard 3 requires that a certain volume of water be recharged to the site depending on existing soil types and square feet of total impervious area over each soil type. The on-site infiltration system must be designed with a minimum infiltration capacity of 2,260 cubic feet. The proposed design directs 53% of the proposed impervious on site to recharge facilities. The resulting adjustment factor and increases the required recharge volume to 4,246 cf. Soils in the proposed area of the infiltration facility are adequate for infiltration, which was confirmed with onsite soil evaluation. Additionally, the bottom of the infiltration facility was placed 4 feet above seasonal high groundwater as determined by the soil evaluation. Please refer to Appendix A for the test pit soil logs.

The infiltration facility proposed for the site will provide a total recharge volume of 7,932 cubic feet, which exceeds the required recharge volume. It should be noted that the proposed Infiltration BMPs do not adversely impact nearby wetland resource areas.

Table 1.3 - Recharge Volume					
STORMWATER MANAGEMENT STANDARD 3 - RECHARGE VOLUME					
	Hydrologic Soil Group				Total
	A	B	C	D	
Impervious Area	270 SF	0 SF	0 SF	269,587 SF	269,857 SF
Inches of Runoff to be Recharged	0.6	0.35	0.25	0.1	
Required Recharge Volume	14 CF	0 CF	0 CF	2,247 CF	2,260 CF
CAPTURE AREA ADJUSTMENT - ADJUSTED MINIMUM REQUIRED RECHARGE VOLUME					
Total Impervious Area		269,857 SF			
65% Impervious Area, Required to be Infiltrated		175,407 SF			
Impervious Area Draining to BMP		143,648 SF	53%	Percent Directed to Recharge BMP	
Ratio of Total Impervious Area to Impervious Area Draining to Recharge BMP		1.88			
Adjusted Required Recharge Volume		4,246 CF			
Proposed Recharge Volume		7,932 CF			

Standard 4: Water Quality

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).

The proposed stormwater management system will achieve the 80% TSS removal requirement for all surface water entering the system. Table 1.4 includes a TSS removal summary for each treatment practice. The Long-term Operations and Maintenance Plan has been developed as part of the analysis and can be found in Section 3.

Treatment of Suspended Solids

Catch basins will be equipped with hoods and four-foot sumps to limit sediment, oils, and grease from being discharged to the drainage system. The proprietary separators will further reduce total suspended solids (TSS) entering the infiltration facility, achieving 44% TSS removal pretreatment required to achieve the 80% removal rate within the infiltration facility. All other proposed impervious areas will be collected in the closed drainage system which is routed through a sedimentation forebay and gravel wetland.

Table 1.4 – Total Suspended Solids Removal				
Subsurface Infiltration Chambers				
BMP	TSS Removal Rate	Starting TSS Load	TSS Removed	Remaining TSS Load
Deep Sump Catchbasin w/Hood	0.25	1.00	0.25	0.75
Proprietary Separator	0.52	0.75	0.39	0.36
Subsurface Chambers	0.80	0.36	0.29	0.07
	Total Suspended Solids Removed:			**93%**
Gravel Wetland				
Deep Sump Catchbasin w/Hood	0.25	1.00	0.25	0.75
Gravel Wetland	0.80	0.75	0.60	0.15
	Total Suspended Solids Removed:			**85%**

Water Quality Volume

See Section 2.5.3 for required water quality volume calculations based on impervious area. The equation is as follows:

Water Quality Volume = Total impervious area of post-development project x 1 inch as required by the Stormwater Standards.

Water Quality Volume = 269,857 SF impervious area x 1.0 inches/12 inches per foot = 22,488 cubic feet.

The three onsite drainage components provide 23,322 CF of treatment volume, which is in excess of the required 22,488 CF.

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

For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.

The proposed project does not qualify as a land use with higher potential pollutant loads, thus is not required to meet the requirements of standard 5. However, as stated above the proposed Operations and Maintenance Plan & Long-Term Pollution Prevention Plan includes measures to help increase the water quality of stormwater runoff.

Standard 6: Critical Areas

Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures.

The project site discharges into an Outstanding Resource Water protection area. Due to these site conditions the proposed discharge is subject to greater stormwater discharge standards. The site is not within or discharge near or to any other critical areas. See Figure 5, Critical Areas.

Due to the project site discharging into an Outstanding Resource Water protection area the use of BMPs are limited to those approved by MassDEP for that protection area. In addition, the Stormwater Standards requires at least 44% TSS pretreatment prior to discharging into an infiltration facility. The primary source of pollution for the site will be the roadway, which is a necessary and integral part of the overall project. The stormwater treatment trains have been designed to meet all DEP stormwater standards.

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

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

The project involves new development of an undeveloped site, and therefore is required to fully meet all the Stormwater Management Standards.

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

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

A Stormwater Pollution Prevention Plan (SWPPP) will be prepared before the disturbance of any earth commences on the project site. The SWPPP will be prepared by others per EPA NPDES NOI guidelines and submitted under a separate cover.

Standard 9: Operation and Maintenance Plan

A Long -Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Please refer to Section 3 for the Operation and Maintenance Plan for the proposed Stormwater Management System.

Standard 10: Prohibition of Illicit Discharges

All illicit discharges to the stormwater management system are prohibited.

There are no known or suspected illicit discharges to the stormwater management system at the redevelopment project site.

Illicit Discharge Compliance Statement: Based on visual observations prior to construction no illicit discharges to the stormwater management system exist within the project area.

Section 2
Drainage Analysis

2.1 Calculation Methods

The design storms analyzed in this study are the 2-year, 10-year, 25-year and 100-year, 24-hour duration storm events. The stormwater modeling system, HydroCAD 10.0, was utilized to predict the peak runoff rates and total volume from these storm events. The peak discharge rates were determined by analyzing Type III, 24-hour storm events. The rainfall data for these storm events was obtained from the data published by the Northeast Regional Climate Center at Cornell University.

The time of concentration was computed using the TR-55 Method, which provides a means of determining the time for an entire watershed to contribute runoff to a specific location via sheet flows, shallow concentrated flow and channel flow. Runoff curve numbers were calculated by determining the coverage areas and then summing the curve number for the coverage area as a percent of the entire watershed.

References:

1. HydroCAD Stormwater Modeling System, by HydroCAD Software Solutions LLC, Chocorua, New Hampshire.
2. "Extreme Precipitation in New York & New England." Extreme Precipitation in New York & New England by Northeast Regional Climate Center (NRCC).

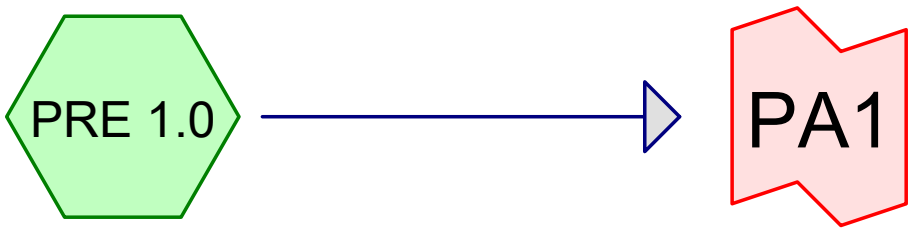
2.2 Pre-Development Conditions

The site is located on the southwest side of Pond Street in Rockland, Massachusetts. The property is mostly wetlands that nearly surround an undeveloped upland area. The upland area is mostly wooded but also has some cleared and brush areas brush. There are access paths that connect the two major upland areas separating the wetland areas. There are existing culverts providing a hydraulic connection between the wetlands beneath the upland access paths. Topography generally slopes from the upland area to the surrounding wetlands. The wetlands generally slope from the northeast discharging flows along southwestern edge of the property. Grades range from approximately 0.5 to 8 percent.

In order to analyze the pre-development condition, one (1) watershed area was modeled at one (1) point of analysis. This point of analysis and watershed area is depicted on the plan entitled "Pre-Development Drainage Plan", Sheet C-801.

2.2.1 Pre-Development Calculations

2.2.2 Pre-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for J5019-002_PRE-Rev-1
Prepared by Tighe & Bond, Printed 8/31/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
6,761	30	Brush, Good, HSG A (PRE 1.0)
1,173	48	Brush, Good, HSG B (PRE 1.0)
32,809	73	Brush, Good, HSG D (PRE 1.0)
74,635	89	Dirt roads, HSG D (PRE 1.0)
1,363	91	Gravel roads, HSG D (PRE 1.0)
192	98	Paved roads w/curbs & sewers, HSG A (PRE 1.0)
5,469	98	Paved roads w/curbs & sewers, HSG D (PRE 1.0)
173	78	Wetlands, HSG A (PRE 1.0)
720,013	78	Wetlands, HSG D (PRE 1.0)
14,765	30	Woods, Good, HSG A (PRE 1.0)
501	55	Woods, Good, HSG B (PRE 1.0)
444,183	77	Woods, Good, HSG D (PRE 1.0)
1,302,037	**77**	**TOTAL AREA**

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=1,302,037 sf 0.43% Impervious Runoff Depth=1.32"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=16.06 cfs 143,234 cf

Link PA1: Inflow=16.06 cfs 143,234 cf
Primary=16.06 cfs 143,234 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 143,234 cf Average Runoff Depth = 1.32"
99.57% Pervious = 1,296,376 sf 0.43% Impervious = 5,661 sf

Summary for Subcatchment PRE 1.0:

Runoff = 16.06 cfs @ 12.97 hrs, Volume= 143,234 cf, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	1,173	48	Brush, Good, HSG B
	32,809	73	Brush, Good, HSG D
	74,635	89	Dirt roads, HSG D
	1,363	91	Gravel roads, HSG D
	192	98	Paved roads w/curbs & sewers, HSG A
	5,469	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,765	30	Woods, Good, HSG A
	501	55	Woods, Good, HSG B
	444,183	77	Woods, Good, HSG D
	1,302,037	77	Weighted Average
	1,296,376		99.57% Pervious Area
	5,661		0.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 0.43% Impervious, Inflow Depth = 1.32" for 2-year event
Inflow = 16.06 cfs @ 12.97 hrs, Volume= 143,234 cf
Primary = 16.06 cfs @ 12.97 hrs, Volume= 143,234 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=1,302,037 sf 0.43% Impervious Runoff Depth=2.58"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=32.35 cfs 280,070 cf

Link PA1: Inflow=32.35 cfs 280,070 cf
Primary=32.35 cfs 280,070 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 280,070 cf Average Runoff Depth = 2.58"
99.57% Pervious = 1,296,376 sf 0.43% Impervious = 5,661 sf

Summary for Subcatchment PRE 1.0:

Runoff = 32.35 cfs @ 12.93 hrs, Volume= 280,070 cf, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	1,173	48	Brush, Good, HSG B
	32,809	73	Brush, Good, HSG D
	74,635	89	Dirt roads, HSG D
	1,363	91	Gravel roads, HSG D
	192	98	Paved roads w/curbs & sewers, HSG A
	5,469	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,765	30	Woods, Good, HSG A
	501	55	Woods, Good, HSG B
	444,183	77	Woods, Good, HSG D
	1,302,037	77	Weighted Average
	1,296,376		99.57% Pervious Area
	5,661		0.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 0.43% Impervious, Inflow Depth = 2.58" for 10-year event
Inflow = 32.35 cfs @ 12.93 hrs, Volume= 280,070 cf
Primary = 32.35 cfs @ 12.93 hrs, Volume= 280,070 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=1,302,037 sf 0.43% Impervious Runoff Depth=3.65"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=45.95 cfs 395,550 cf

Link PA1: Inflow=45.95 cfs 395,550 cf
Primary=45.95 cfs 395,550 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 395,550 cf Average Runoff Depth = 3.65"
99.57% Pervious = 1,296,376 sf 0.43% Impervious = 5,661 sf

Summary for Subcatchment PRE 1.0:

Runoff = 45.95 cfs @ 12.92 hrs, Volume= 395,550 cf, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	1,173	48	Brush, Good, HSG B
	32,809	73	Brush, Good, HSG D
	74,635	89	Dirt roads, HSG D
	1,363	91	Gravel roads, HSG D
	192	98	Paved roads w/curbs & sewers, HSG A
	5,469	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,765	30	Woods, Good, HSG A
	501	55	Woods, Good, HSG B
	444,183	77	Woods, Good, HSG D
	1,302,037	77	Weighted Average
	1,296,376		99.57% Pervious Area
	5,661		0.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 0.43% Impervious, Inflow Depth = 3.65" for 25-year event
Inflow = 45.95 cfs @ 12.92 hrs, Volume= 395,550 cf
Primary = 45.95 cfs @ 12.92 hrs, Volume= 395,550 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

SubcatchmentPRE 1.0: Runoff Area=1,302,037 sf 0.43% Impervious Runoff Depth=5.90"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=74.10 cfs 640,341 cf

Link PA1: Inflow=74.10 cfs 640,341 cf
Primary=74.10 cfs 640,341 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 640,341 cf Average Runoff Depth = 5.90"
99.57% Pervious = 1,296,376 sf 0.43% Impervious = 5,661 sf

Summary for Subcatchment PRE 1.0:

Runoff = 74.10 cfs @ 12.91 hrs, Volume= 640,341 cf, Depth= 5.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	1,173	48	Brush, Good, HSG B
	32,809	73	Brush, Good, HSG D
	74,635	89	Dirt roads, HSG D
	1,363	91	Gravel roads, HSG D
	192	98	Paved roads w/curbs & sewers, HSG A
	5,469	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,765	30	Woods, Good, HSG A
	501	55	Woods, Good, HSG B
	444,183	77	Woods, Good, HSG D
	1,302,037	77	Weighted Average
	1,296,376		99.57% Pervious Area
	5,661		0.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 0.43% Impervious, Inflow Depth = 5.90" for 100-year event
Inflow = 74.10 cfs @ 12.91 hrs, Volume= 640,341 cf
Primary = 74.10 cfs @ 12.91 hrs, Volume= 640,341 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

655A
HSG B/D

626B
HSG A

23A
HSG A/D

PRE
1.0

52A
HSG B/D

23A
HSG A/D

PA-1

FRIGHT STREET
(previously 30' wide)

CURRY STREET
(public--40' wide)

WILSON STREET
(private--40' wide)

STONE STREET
(private--30' wide)

COLBY STREET
(public--40' wide)

LEGEND

- PRE-DEVELOPMENT WATERSHED BOUNDARY
- WEB SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- PRE 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- PRE POND 1 — PRE-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS

Tighe&Bond

N

SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Shinglemill Multi-Family Development

Jones Street Residential

Pond Street
Rockland,
Massachusetts

MARK	DATE	DESCRIPTION
A	7/13/2020	Submitted for Special ZBA Permit

PROJECT NO:	J5019-002
DATE:	7/13/2020
FILE:	J5019-002-C-WSHD.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

PRE-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-801

Last Save Date: July 13, 2020 17:22 PM By: NAHANSEN
Plot Date: Monday, July 13, 2020 5:22:27 PM By: Neil A. Hansen
T&B File Location: J:\J5019 Jones Street\002 Pond St, Rockland\Drawings_Figures\AutoCAD\Sheet\J5019-002-C-WSHD.DWG Layout Tab: Pre

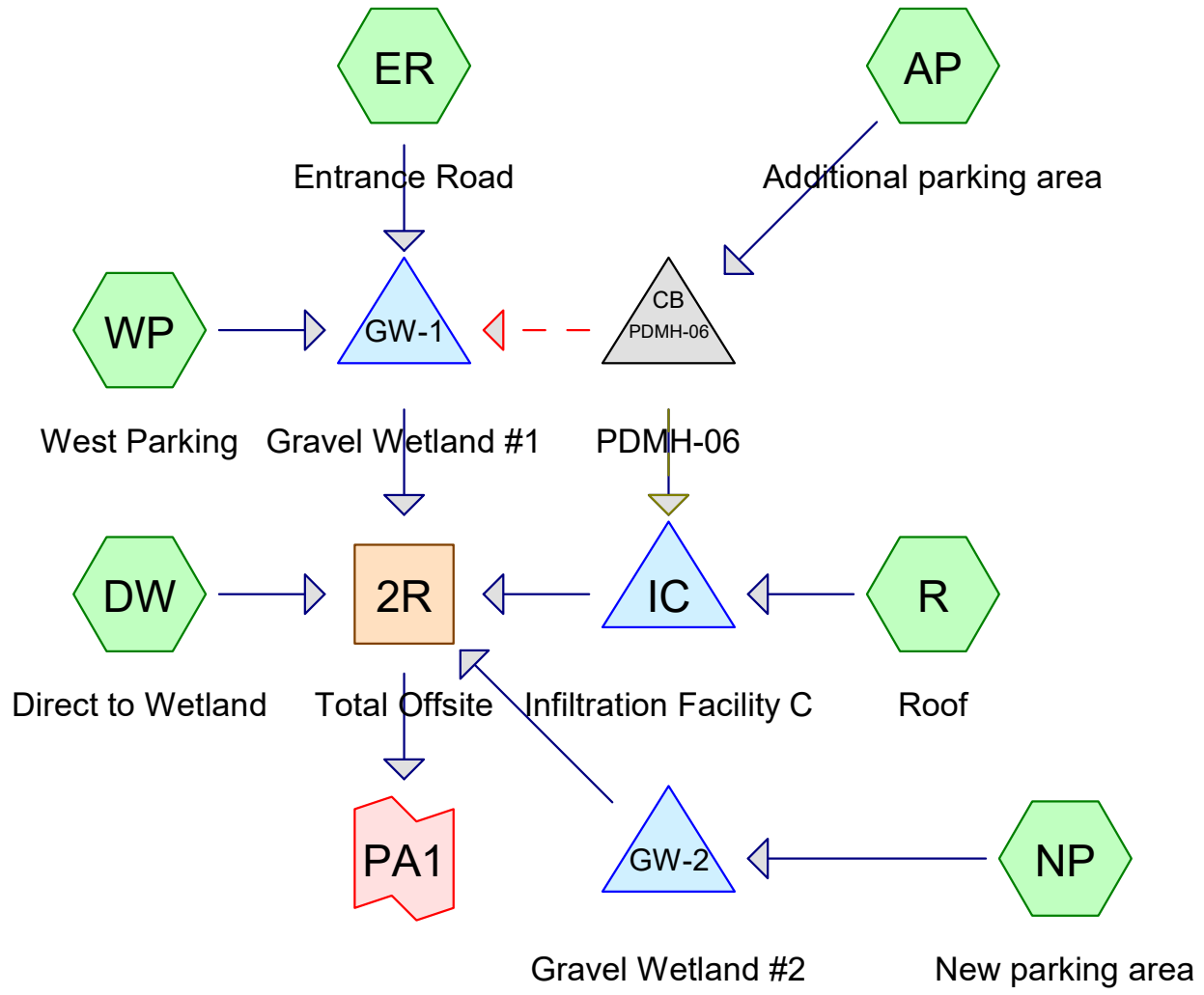
2.3 Post Development Conditions

The post-development condition consists of the two apartment buildings, a community building, and recreational open space areas. In addition to these new structures, associated access drives, parking areas, walkways, utilities, and drainage systems will be installed throughout the site. These changes increase the overall impervious area found at the site. However, the proposed drainage system has been designed to capture the previously uncontrolled stormwater runoff and direct flows to storage and infiltration facilities, which results in a reduction of the peak rate and total volume of runoff. Furthermore, with the addition of the deep sump catch basins with oil/gas hoods, proprietary separators, gravel wetland and an infiltration facility the runoff from the impervious areas will be cleaned appropriately prior to discharge.

The post-development condition was analyzed by dividing the site into six (6) watershed areas. Stormwater runoff from these areas flow mostly by underground drainage to the gravel wetland or subsurface chamber system prior to being discharged into the onsite wetlands. Flows from these sub-catchment areas are modeled at the same point of analysis that was modeled in the pre-development analysis, PA-1. This point of analysis and sub-catchment areas are depicted on the plan entitled "Post-Development Drainage Plan", Sheet C-802.

2.3.1 Post-Development Calculations

2.3.2 Post-Development Watershed Plans



Subcat Reach Pond Link

Routing Diagram for J5019-002_Post_Rev-2
Prepared by Tighe & Bond, Printed 12/4/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
596	61	>75% Grass cover, Good, HSG B (DW)
70,994	80	>75% Grass cover, Good, HSG D (AP, DW, ER, NP, WP)
6,761	30	Brush, Good, HSG A (DW)
878	48	Brush, Good, HSG B (DW)
15,473	73	Brush, Good, HSG D (DW)
13,695	89	Dirt roads, HSG D (DW)
1,434	91	Gravel roads, HSG D (DW)
134,164	98	Paved parking, HSG D (AP, NP)
270	98	Paved roads w/curbs & sewers, HSG A (DW)
52,265	98	Paved roads w/curbs & sewers, HSG D (DW, ER, WP)
59,482	98	Roofs, HSG D (AP, R)
7,000	98	Unconnected pavement, HSG D (DW)
1,547	98	Unconnected roofs, HSG D (DW)
173	78	Wetlands, HSG A (DW)
720,013	78	Wetlands, HSG D (DW)
14,687	30	Woods, Good, HSG A (DW)
200	55	Woods, Good, HSG B (DW)
202,405	77	Woods, Good, HSG D (DW)
1,302,037	**81**	**TOTAL AREA**

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment AP: Additional parking Runoff Area=122,014 sf 96.13% Impervious Runoff Depth>2.97"
Tc=6.0 min CN=97 Runoff=8.78 cfs 30,205 cf

Subcatchment DW: Direct to Wetland Runoff Area=1,029,991 sf 1.13% Impervious Runoff Depth=1.32"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=12.71 cfs 113,307 cf

Subcatchment ER: Entrance Road Runoff Area=23,348 sf 98.74% Impervious Runoff Depth>3.06"
Tc=6.0 min CN=98 Runoff=1.70 cfs 5,949 cf

Subcatchment NP: New parking area Runoff Area=54,700 sf 91.41% Impervious Runoff Depth>2.88"
Tc=6.0 min CN=96 Runoff=3.87 cfs 13,116 cf

Subcatchment R: Roof Runoff Area=26,352 sf 100.00% Impervious Runoff Depth>3.06"
Tc=6.0 min CN=98 Runoff=1.92 cfs 6,715 cf

Subcatchment WP: West Parking Runoff Area=45,632 sf 57.82% Impervious Runoff Depth=2.31"
Tc=6.0 min CN=90 Runoff=2.74 cfs 8,776 cf

Reach 2R: Total Offsite Inflow=14.12 cfs 142,229 cf
Outflow=14.12 cfs 142,229 cf

Pond GW-1: Gravel Wetland #1 Peak Elev=136.68' Storage=13,260 cf Inflow=8.54 cfs 17,965 cf
Outflow=0.19 cfs 12,932 cf

Pond GW-2: Gravel Wetland #2 Peak Elev=135.38' Storage=4,207 cf Inflow=3.87 cfs 13,116 cf
Outflow=3.15 cfs 11,348 cf

Pond IC: Infiltration Facility C Peak Elev=138.43' Storage=10,615 cf Inflow=6.61 cfs 33,680 cf
Discarded=0.62 cfs 29,039 cf Primary=1.13 cfs 4,643 cf Outflow=1.75 cfs 33,681 cf

Pond PDMH-06: PDMH-06 Peak Elev=139.53' Inflow=8.78 cfs 30,205 cf
Primary=4.69 cfs 26,965 cf Secondary=4.10 cfs 3,240 cf Outflow=8.78 cfs 30,205 cf

Link PA1: Inflow=14.12 cfs 142,229 cf
Primary=14.12 cfs 142,229 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 178,068 cf Average Runoff Depth = 1.64"
80.44% Pervious = 1,047,309 sf 19.56% Impervious = 254,728 sf

Summary for Subcatchment AP: Additional parking area

Runoff = 8.78 cfs @ 12.09 hrs, Volume= 30,205 cf, Depth> 2.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

Area (sf)	CN	Description
4,720	80	>75% Grass cover, Good, HSG D
84,164	98	Paved parking, HSG D
33,130	98	Roofs, HSG D
122,014	97	Weighted Average
4,720		3.87% Pervious Area
117,294		96.13% Impervious Area

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

Summary for Subcatchment DW: Direct to Wetland

Runoff = 12.71 cfs @ 12.97 hrs, Volume= 113,307 cf, Depth= 1.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	878	48	Brush, Good, HSG B
	15,473	73	Brush, Good, HSG D
	13,695	89	Dirt roads, HSG D
	1,434	91	Gravel roads, HSG D
	270	98	Paved roads w/curbs & sewers, HSG A
	2,827	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,687	30	Woods, Good, HSG A
	200	55	Woods, Good, HSG B
	202,405	77	Woods, Good, HSG D
	596	61	>75% Grass cover, Good, HSG B
	42,032	80	>75% Grass cover, Good, HSG D
	1,547	98	Unconnected roofs, HSG D
	7,000	98	Unconnected pavement, HSG D
	1,029,991	77	Weighted Average
	1,018,347		98.87% Pervious Area
	11,644		1.13% Impervious Area
	8,547		73.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Subcatchment ER: Entrance Road

Runoff = 1.70 cfs @ 12.09 hrs, Volume= 5,949 cf, Depth> 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

Area (sf)	CN	Description
295	80	>75% Grass cover, Good, HSG D
23,053	98	Paved roads w/curbs & sewers, HSG D
23,348	98	Weighted Average
295		1.26% Pervious Area
23,053		98.74% Impervious Area

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

Summary for Subcatchment NP: New parking area

Runoff = 3.87 cfs @ 12.09 hrs, Volume= 13,116 cf, Depth> 2.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

Area (sf)	CN	Description
4,700	80	>75% Grass cover, Good, HSG D
50,000	98	Paved parking, HSG D
54,700	96	Weighted Average
4,700		8.59% Pervious Area
50,000		91.41% Impervious Area

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

Summary for Subcatchment R: Roof

Runoff = 1.92 cfs @ 12.09 hrs, Volume= 6,715 cf, Depth> 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

Area (sf)	CN	Description
26,352	98	Roofs, HSG D
26,352		100.00% Impervious Area

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

Summary for Subcatchment WP: West Parking

Runoff = 2.74 cfs @ 12.09 hrs, Volume= 8,776 cf, Depth= 2.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-year Rainfall=3.35"

Area (sf)	CN	Description
19,247	80	>75% Grass cover, Good, HSG D
26,385	98	Paved roads w/curbs & sewers, HSG D
45,632	90	Weighted Average
19,247		42.18% Pervious Area
26,385		57.82% Impervious Area

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

Summary for Reach 2R: Total Offsite

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 1.31" for 2-year event
Inflow = 14.12 cfs @ 12.93 hrs, Volume= 142,229 cf
Outflow = 14.12 cfs @ 12.93 hrs, Volume= 142,229 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area = 68,980 sf, 71.67% Impervious, Inflow Depth > 3.13" for 2-year event
Inflow = 8.54 cfs @ 12.09 hrs, Volume= 17,965 cf
Outflow = 0.19 cfs @ 15.03 hrs, Volume= 12,932 cf, Atten= 98%, Lag= 176.5 min
Primary = 0.19 cfs @ 15.03 hrs, Volume= 12,932 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 136.68' @ 15.03 hrs Surf.Area= 7,907 sf Storage= 13,260 cf
Flood Elev= 139.50' Surf.Area= 13,553 sf Storage= 43,583 cf

Plug-Flow detention time= 645.4 min calculated for 12,916 cf (72% of inflow)
Center-of-Mass det. time= 568.5 min (1,346.4 - 777.8)

Volume	Invert	Avail.Storage	Storage Description
#1	132.50'	43,583 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.50	5,152	0.0	0	0
134.85	5,152	40.0	4,843	4,843
135.50	5,836	10.0	357	5,200
136.00	6,681	100.0	3,129	8,329
137.00	8,494	100.0	7,588	15,917
138.00	10,525	100.0	9,510	25,426
139.00	12,675	100.0	11,600	37,026
139.50	13,553	100.0	6,557	43,583

Device	Routing	Invert	Outlet Devices
#1	Primary	135.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.20' / 135.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	135.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	137.25'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	138.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.19 cfs @ 15.03 hrs HW=136.68' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.19 cfs of 7.07 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 5.64 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-1: Gravel Wetland #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.50	5,152	0
132.60	5,152	206
132.70	5,152	412
132.80	5,152	618
132.90	5,152	824
133.00	5,152	1,030
133.10	5,152	1,236
133.20	5,152	1,443
133.30	5,152	1,649
133.40	5,152	1,855
133.50	5,152	2,061
133.60	5,152	2,267
133.70	5,152	2,473
133.80	5,152	2,679
133.90	5,152	2,885
134.00	5,152	3,091
134.10	5,152	3,297
134.20	5,152	3,503
134.30	5,152	3,709
134.40	5,152	3,916
134.50	5,152	4,122
134.60	5,152	4,328
134.70	5,152	4,534
134.80	5,152	4,740
134.90	5,205	4,869
135.00	5,310	4,921
135.10	5,415	4,975
135.20	5,520	5,030
135.30	5,626	5,085
135.40	5,731	5,142
135.50	5,836	5,200
135.60	6,005	5,792
135.70	6,174	6,401
135.80	6,343	7,027
135.90	6,512	7,670
136.00	6,681	8,329
136.10	6,862	9,006
136.20	7,044	9,702
136.30	7,225	10,415
136.40	7,406	11,147
136.50	7,588	11,896
136.60	7,769	12,664
136.70	7,950	13,450
136.80	8,131	14,254
136.90	8,313	15,076
137.00	8,494	15,917
137.10	8,697	16,776
137.20	8,900	17,656
137.30	9,103	18,556
137.40	9,306	19,477
137.50	9,510	20,418
137.60	9,713	21,379
137.70	9,916	22,360
137.80	10,119	23,362
137.90	10,322	24,384
138.00	10,525	25,426
138.10	10,740	26,489
138.20	10,955	27,574
138.30	11,170	28,680
138.40	11,385	29,808
138.50	11,600	30,957
138.60	11,815	32,128
138.70	12,030	33,320
138.80	12,245	34,534
138.90	12,460	35,769
139.00	12,675	37,026
139.10	12,851	38,303
139.20	13,026	39,596
139.30	13,202	40,908
139.40	13,377	42,237
139.50	**13,553**	**43,583**

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area = 54,700 sf, 91.41% Impervious, Inflow Depth > 2.88" for 2-year event
Inflow = 3.87 cfs @ 12.09 hrs, Volume= 13,116 cf
Outflow = 3.15 cfs @ 12.15 hrs, Volume= 11,348 cf, Atten= 19%, Lag= 3.8 min
Primary = 3.15 cfs @ 12.15 hrs, Volume= 11,348 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 135.38' @ 12.15 hrs Surf.Area= 3,277 sf Storage= 4,207 cf
Flood Elev= 137.00' Surf.Area= 5,615 sf Storage= 11,376 cf

Plug-Flow detention time= 160.9 min calculated for 11,346 cf (87% of inflow)
Center-of-Mass det. time= 100.6 min (876.9 - 776.3)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	11,376 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
131.50	1,810	0.0	0	0
133.85	1,810	40.0	1,701	1,701
134.50	2,175	10.0	130	1,831
135.00	2,765	100.0	1,235	3,066
136.00	4,120	100.0	3,443	6,508
137.00	5,615	100.0	4,868	11,376

Device	Routing	Invert	Outlet Devices
#1	Primary	134.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.20' / 134.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	134.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	135.00'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	136.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.14 cfs @ 12.15 hrs HW=135.38' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.14 cfs of 4.74 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.17 cfs @ 4.99 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.97 cfs @ 2.01 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-2: Gravel Wetland #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
131.50	1,810	0
131.60	1,810	72
131.70	1,810	145
131.80	1,810	217
131.90	1,810	290
132.00	1,810	362
132.10	1,810	434
132.20	1,810	507
132.30	1,810	579
132.40	1,810	652
132.50	1,810	724
132.60	1,810	796
132.70	1,810	869
132.80	1,810	941
132.90	1,810	1,014
133.00	1,810	1,086
133.10	1,810	1,158
133.20	1,810	1,231
133.30	1,810	1,303
133.40	1,810	1,376
133.50	1,810	1,448
133.60	1,810	1,520
133.70	1,810	1,593
133.80	1,810	1,665
133.90	1,838	1,711
134.00	1,894	1,729
134.10	1,950	1,748
134.20	2,007	1,768
134.30	2,063	1,789
134.40	2,119	1,809
134.50	2,175	1,831
134.60	2,293	2,054
134.70	2,411	2,290
134.80	2,529	2,537
134.90	2,647	2,795
135.00	2,765	3,066
135.10	2,900	3,349
135.20	3,036	3,646
135.30	3,172	3,956
135.40	3,307	4,280
135.50	3,443	4,618
135.60	3,578	4,969
135.70	3,713	5,333
135.80	3,849	5,712
135.90	3,985	6,103
136.00	4,120	6,508
136.10	4,269	6,928
136.20	4,419	7,362
136.30	4,569	7,812
136.40	4,718	8,276
136.50	4,868	8,755
136.60	5,017	9,250
136.70	5,166	9,759
136.80	5,316	10,283
136.90	5,466	10,822
137.00	**5,615**	**11,376**

Summary for Pond IC: Infiltration Facility C

Inflow Area = 148,366 sf, 96.82% Impervious, Inflow Depth > 2.72" for 2-year event
Inflow = 6.61 cfs @ 12.09 hrs, Volume= 33,680 cf
Outflow = 1.75 cfs @ 12.56 hrs, Volume= 33,681 cf, Atten= 74%, Lag= 28.5 min
Discarded = 0.62 cfs @ 11.10 hrs, Volume= 29,039 cf
Primary = 1.13 cfs @ 12.56 hrs, Volume= 4,643 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 138.43' @ 12.56 hrs Surf.Area= 11,888 sf Storage= 10,615 cf
Flood Elev= 139.33' Surf.Area= 11,888 sf Storage= 15,325 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 93.5 min (867.9 - 774.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	137.00'	8,265 cf	**54.83'W x 216.80'L x 2.33'H Field A** 27,738 cf Overall - 7,076 cf Embedded = 20,662 cf x 40.0% Voids
#2A	137.50'	7,076 cf	**ADS_StormTech SC-310 +Cap** x 480 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 16 Rows of 30 Chambers
		15,341 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	**24.0" Round Culvert** L= 130.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 136.00' S= 0.0154 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	137.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.62 cfs @ 11.10 hrs HW=137.04' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.62 cfs)

Primary OutFlow Max=1.13 cfs @ 12.56 hrs HW=138.43' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.13 cfs @ 2.24 fps)

Pond IC: Infiltration Facility C - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

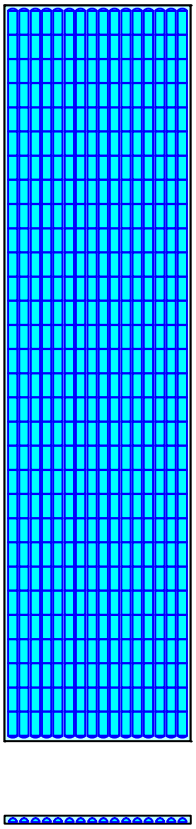
30 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 214.80' Row Length +12.0" End Stone x 2 = 216.80' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

480 Chambers x 14.7 cf = 7,076.1 cf Chamber Storage

27,738.4 cf Field - 7,076.1 cf Chambers = 20,662.2 cf Stone x 40.0% Voids = 8,264.9 cf Stone Storage

Chamber Storage + Stone Storage = 15,341.0 cf = 0.352 af
Overall Storage Efficiency = 55.3%
Overall System Size = 216.80' x 54.83' x 2.33'

480 Chambers
1,027.3 cy Field
765.3 cy Stone



Stage-Area-Storage for Pond IC: Infiltration Facility C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
137.00	**11,888**	0
137.05	11,888	238
137.10	11,888	476
137.15	11,888	713
137.20	11,888	951
137.25	11,888	1,189
137.30	11,888	1,427
137.35	11,888	1,664
137.40	11,888	1,902
137.45	11,888	2,140
137.50	11,888	2,378
137.55	11,888	2,862
137.60	11,888	3,345
137.65	11,888	3,824
137.70	11,888	4,301
137.75	11,888	4,773
137.80	11,888	5,241
137.85	11,888	5,704
137.90	11,888	6,162
137.95	11,888	6,614
138.00	11,888	7,059
138.05	11,888	7,499
138.10	11,888	7,932
138.15	11,888	8,358
138.20	11,888	8,777
138.25	11,888	9,187
138.30	11,888	9,588
138.35	11,888	9,979
138.40	11,888	10,358
138.45	11,888	10,726
138.50	11,888	11,079
138.55	11,888	11,414
138.60	11,888	11,725
138.65	11,888	12,016
138.70	11,888	12,289
138.75	11,888	12,551
138.80	11,888	12,802
138.85	11,888	13,043
138.90	11,888	13,280
138.95	11,888	13,518
139.00	11,888	13,756
139.05	11,888	13,994
139.10	11,888	14,231
139.15	11,888	14,469
139.20	11,888	14,707
139.25	11,888	14,945
139.30	11,888	**15,183**
139.35	11,888	**15,341**
139.40	11,888	15,341
139.45	11,888	15,341
139.50	11,888	15,341
139.55	11,888	15,341
139.60	11,888	15,341
139.65	11,888	15,341
139.70	11,888	15,341
139.75	11,888	15,341
139.80	11,888	15,341
139.85	11,888	15,341
139.90	11,888	15,341
139.95	11,888	15,341
140.00	11,888	15,341

Summary for Pond PDMH-06: PDMH-06

Inflow Area = 122,014 sf, 96.13% Impervious, Inflow Depth > 2.97" for 2-year event
Inflow = 8.78 cfs @ 12.09 hrs, Volume= 30,205 cf
Outflow = 8.78 cfs @ 12.09 hrs, Volume= 30,205 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.69 cfs @ 12.08 hrs, Volume= 26,965 cf
Secondary = 4.10 cfs @ 12.09 hrs, Volume= 3,240 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 139.53' @ 12.09 hrs
Flood Elev= 143.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	**12.0" Round Culvert** L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	138.55'	**18.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.55' / 137.50' S= 0.0420 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.63 cfs @ 12.08 hrs HW=139.50' TW=137.90' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.63 cfs @ 5.89 fps)

Secondary OutFlow Max=3.92 cfs @ 12.09 hrs HW=139.50' TW=135.84' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 3.92 cfs @ 3.32 fps)

Stage-Area-Storage for Pond PDMH-06: PDMH-06

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
137.50	**0**	142.70	0
137.60	0	142.80	0
137.70	0	142.90	0
137.80	0	143.00	0
137.90	0	143.10	0
138.00	0	143.20	0
138.10	0	143.30	0
138.20	0	143.40	0
138.30	0	143.50	0
138.40	0	143.60	0
138.50	0	143.70	0
138.60	0	143.80	0
138.70	0	143.90	0
138.80	0		
138.90	0		
139.00	0		
139.10	0		
139.20	0		
139.30	0		
139.40	0		
139.50	0		
139.60	0		
139.70	0		
139.80	0		
139.90	0		
140.00	0		
140.10	0		
140.20	0		
140.30	0		
140.40	0		
140.50	0		
140.60	0		
140.70	0		
140.80	0		
140.90	0		
141.00	0		
141.10	0		
141.20	0		
141.30	0		
141.40	0		
141.50	0		
141.60	0		
141.70	0		
141.80	0		
141.90	0		
142.00	0		
142.10	0		
142.20	0		
142.30	0		
142.40	0		
142.50	0		
142.60	0		

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 1.31" for 2-year event
Inflow = 14.12 cfs @ 12.93 hrs, Volume= 142,229 cf
Primary = 14.12 cfs @ 12.93 hrs, Volume= 142,229 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment AP: Additional parking Runoff Area=122,014 sf 96.13% Impervious Runoff Depth>4.51"
Tc=6.0 min CN=97 Runoff=13.15 cfs 45,876 cf

Subcatchment DW: Direct to Wetland Runoff Area=1,029,991 sf 1.13% Impervious Runoff Depth=2.58"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=25.59 cfs 221,552 cf

Subcatchment ER: Entrance Road Runoff Area=23,348 sf 98.74% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=98 Runoff=2.53 cfs 8,931 cf

Subcatchment NP: New parking area Runoff Area=54,700 sf 91.41% Impervious Runoff Depth>4.42"
Tc=6.0 min CN=96 Runoff=5.84 cfs 20,165 cf

Subcatchment R: Roof Runoff Area=26,352 sf 100.00% Impervious Runoff Depth>4.59"
Tc=6.0 min CN=98 Runoff=2.86 cfs 10,080 cf

Subcatchment WP: West Parking Runoff Area=45,632 sf 57.82% Impervious Runoff Depth>3.83"
Tc=6.0 min CN=90 Runoff=4.44 cfs 14,549 cf

Reach 2R: Total Offsite Inflow=29.06 cfs 279,409 cf
Outflow=29.06 cfs 279,409 cf

Pond GW-1: Gravel Wetland #1 Peak Elev=137.57' Storage=21,090 cf Inflow=14.89 cfs 32,194 cf
Outflow=2.58 cfs 27,156 cf

Pond GW-2: Gravel Wetland #2 Peak Elev=135.52' Storage=4,676 cf Inflow=5.84 cfs 20,165 cf
Outflow=4.91 cfs 18,397 cf

Pond IC: Infiltration Facility C Peak Elev=138.74' Storage=12,516 cf Inflow=8.10 cfs 47,241 cf
Discarded=0.62 cfs 34,956 cf Primary=3.12 cfs 12,304 cf Outflow=3.74 cfs 47,260 cf

Pond PDMH-06: PDMH-06 Peak Elev=140.16' Inflow=13.15 cfs 45,876 cf
Primary=5.24 cfs 37,161 cf Secondary=7.92 cfs 8,715 cf Outflow=13.15 cfs 45,876 cf

Link PA1: Inflow=29.06 cfs 279,409 cf
Primary=29.06 cfs 279,409 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 321,153 cf Average Runoff Depth = 2.96"
80.44% Pervious = 1,047,309 sf 19.56% Impervious = 254,728 sf

Summary for Subcatchment AP: Additional parking area

Runoff = 13.15 cfs @ 12.09 hrs, Volume= 45,876 cf, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

Area (sf)	CN	Description
4,720	80	>75% Grass cover, Good, HSG D
84,164	98	Paved parking, HSG D
33,130	98	Roofs, HSG D
122,014	97	Weighted Average
4,720		3.87% Pervious Area
117,294		96.13% Impervious Area

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

Summary for Subcatchment DW: Direct to Wetland

Runoff = 25.59 cfs @ 12.93 hrs, Volume= 221,552 cf, Depth= 2.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	878	48	Brush, Good, HSG B
	15,473	73	Brush, Good, HSG D
	13,695	89	Dirt roads, HSG D
	1,434	91	Gravel roads, HSG D
	270	98	Paved roads w/curbs & sewers, HSG A
	2,827	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,687	30	Woods, Good, HSG A
	200	55	Woods, Good, HSG B
	202,405	77	Woods, Good, HSG D
	596	61	>75% Grass cover, Good, HSG B
	42,032	80	>75% Grass cover, Good, HSG D
	1,547	98	Unconnected roofs, HSG D
	7,000	98	Unconnected pavement, HSG D
	1,029,991	77	Weighted Average
	1,018,347		98.87% Pervious Area
	11,644		1.13% Impervious Area
	8,547		73.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Subcatchment ER: Entrance Road

Runoff = 2.53 cfs @ 12.09 hrs, Volume= 8,931 cf, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

Area (sf)	CN	Description
295	80	>75% Grass cover, Good, HSG D
23,053	98	Paved roads w/curbs & sewers, HSG D
23,348	98	Weighted Average
295		1.26% Pervious Area
23,053		98.74% Impervious Area

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

Summary for Subcatchment NP: New parking area

Runoff = 5.84 cfs @ 12.09 hrs, Volume= 20,165 cf, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

Area (sf)	CN	Description
4,700	80	>75% Grass cover, Good, HSG D
50,000	98	Paved parking, HSG D
54,700	96	Weighted Average
4,700		8.59% Pervious Area
50,000		91.41% Impervious Area

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

Summary for Subcatchment R: Roof

Runoff = 2.86 cfs @ 12.09 hrs, Volume= 10,080 cf, Depth> 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

Area (sf)	CN	Description
26,352	98	Roofs, HSG D
26,352		100.00% Impervious Area

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

Summary for Subcatchment WP: West Parking

Runoff = 4.44 cfs @ 12.09 hrs, Volume= 14,549 cf, Depth> 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-year Rainfall=4.95"

Area (sf)	CN	Description
19,247	80	>75% Grass cover, Good, HSG D
26,385	98	Paved roads w/curbs & sewers, HSG D
45,632	90	Weighted Average
19,247		42.18% Pervious Area
26,385		57.82% Impervious Area

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

Summary for Reach 2R: Total Offsite

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 2.58" for 10-year event
Inflow = 29.06 cfs @ 12.90 hrs, Volume= 279,409 cf
Outflow = 29.06 cfs @ 12.90 hrs, Volume= 279,409 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area = 68,980 sf, 71.67% Impervious, Inflow Depth > 5.60" for 10-year event
Inflow = 14.89 cfs @ 12.09 hrs, Volume= 32,194 cf
Outflow = 2.58 cfs @ 12.49 hrs, Volume= 27,156 cf, Atten= 83%, Lag= 24.1 min
Primary = 2.58 cfs @ 12.49 hrs, Volume= 27,156 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 137.57' @ 12.49 hrs Surf.Area= 9,652 sf Storage= 21,090 cf
Flood Elev= 139.50' Surf.Area= 13,553 sf Storage= 43,583 cf

Plug-Flow detention time= 604.2 min calculated for 27,153 cf (84% of inflow)
Center-of-Mass det. time= 548.2 min (1,314.6 - 766.3)

Volume	Invert	Avail.Storage	Storage Description
#1	132.50'	43,583 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.50	5,152	0.0	0	0
134.85	5,152	40.0	4,843	4,843
135.50	5,836	10.0	357	5,200
136.00	6,681	100.0	3,129	8,329
137.00	8,494	100.0	7,588	15,917
138.00	10,525	100.0	9,510	25,426
139.00	12,675	100.0	11,600	37,026
139.50	13,553	100.0	6,557	43,583

Device	Routing	Invert	Outlet Devices
#1	Primary	135.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.20' / 135.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	135.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	137.25'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	138.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.57 cfs @ 12.49 hrs HW=137.57' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 2.57 cfs of 14.61 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.25 cfs @ 7.25 fps)
  ├─**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.32 cfs @ 1.85 fps)
  └─**4=Orifice/Grate** (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-1: Gravel Wetland #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.50	5,152	0
132.60	5,152	206
132.70	5,152	412
132.80	5,152	618
132.90	5,152	824
133.00	5,152	1,030
133.10	5,152	1,236
133.20	5,152	1,443
133.30	5,152	1,649
133.40	5,152	1,855
133.50	5,152	2,061
133.60	5,152	2,267
133.70	5,152	2,473
133.80	5,152	2,679
133.90	5,152	2,885
134.00	5,152	3,091
134.10	5,152	3,297
134.20	5,152	3,503
134.30	5,152	3,709
134.40	5,152	3,916
134.50	5,152	4,122
134.60	5,152	4,328
134.70	5,152	4,534
134.80	5,152	4,740
134.90	5,205	4,869
135.00	5,310	4,921
135.10	5,415	4,975
135.20	5,520	5,030
135.30	5,626	5,085
135.40	5,731	5,142
135.50	5,836	5,200
135.60	6,005	5,792
135.70	6,174	6,401
135.80	6,343	7,027
135.90	6,512	7,670
136.00	6,681	8,329
136.10	6,862	9,006
136.20	7,044	9,702
136.30	7,225	10,415
136.40	7,406	11,147
136.50	7,588	11,896
136.60	7,769	12,664
136.70	7,950	13,450
136.80	8,131	14,254
136.90	8,313	15,076
137.00	8,494	15,917
137.10	8,697	16,776
137.20	8,900	17,656
137.30	9,103	18,556
137.40	9,306	19,477
137.50	9,510	20,418
137.60	9,713	21,379
137.70	9,916	22,360
137.80	10,119	23,362
137.90	10,322	24,384
138.00	10,525	25,426
138.10	10,740	26,489
138.20	10,955	27,574
138.30	11,170	28,680
138.40	11,385	29,808
138.50	11,600	30,957
138.60	11,815	32,128
138.70	12,030	33,320
138.80	12,245	34,534
138.90	12,460	35,769
139.00	12,675	37,026
139.10	12,851	38,303
139.20	13,026	39,596
139.30	13,202	40,908
139.40	13,377	42,237
139.50	**13,553**	**43,583**

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area = 54,700 sf, 91.41% Impervious, Inflow Depth > 4.42" for 10-year event
Inflow = 5.84 cfs @ 12.09 hrs, Volume= 20,165 cf
Outflow = 4.91 cfs @ 12.14 hrs, Volume= 18,397 cf, Atten= 16%, Lag= 3.4 min
Primary = 4.91 cfs @ 12.14 hrs, Volume= 18,397 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 135.52' @ 12.14 hrs Surf.Area= 3,465 sf Storage= 4,676 cf
Flood Elev= 137.00' Surf.Area= 5,615 sf Storage= 11,376 cf

Plug-Flow detention time= 127.3 min calculated for 18,371 cf (91% of inflow)
Center-of-Mass det. time= 83.2 min (852.8 - 769.7)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	11,376 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
131.50	1,810	0.0	0	0
133.85	1,810	40.0	1,701	1,701
134.50	2,175	10.0	130	1,831
135.00	2,765	100.0	1,235	3,066
136.00	4,120	100.0	3,443	6,508
137.00	5,615	100.0	4,868	11,376

Device	Routing	Invert	Outlet Devices
#1	Primary	134.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.20' / 134.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	134.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	135.00'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	136.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.87 cfs @ 12.14 hrs HW=135.51' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 4.87 cfs of 5.77 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.18 cfs @ 5.29 fps)
3=Sharp-Crested Rectangular Weir (Weir Controls 4.69 cfs @ 2.34 fps)
4=Orifice/Grate (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-2: Gravel Wetland #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
131.50	1,810	0
131.60	1,810	72
131.70	1,810	145
131.80	1,810	217
131.90	1,810	290
132.00	1,810	362
132.10	1,810	434
132.20	1,810	507
132.30	1,810	579
132.40	1,810	652
132.50	1,810	724
132.60	1,810	796
132.70	1,810	869
132.80	1,810	941
132.90	1,810	1,014
133.00	1,810	1,086
133.10	1,810	1,158
133.20	1,810	1,231
133.30	1,810	1,303
133.40	1,810	1,376
133.50	1,810	1,448
133.60	1,810	1,520
133.70	1,810	1,593
133.80	1,810	1,665
133.90	1,838	1,711
134.00	1,894	1,729
134.10	1,950	1,748
134.20	2,007	1,768
134.30	2,063	1,789
134.40	2,119	1,809
134.50	2,175	1,831
134.60	2,293	2,054
134.70	2,411	2,290
134.80	2,529	2,537
134.90	2,647	2,795
135.00	2,765	3,066
135.10	2,900	3,349
135.20	3,036	3,646
135.30	3,172	3,956
135.40	3,307	4,280
135.50	3,443	4,618
135.60	3,578	4,969
135.70	3,713	5,333
135.80	3,849	5,712
135.90	3,985	6,103
136.00	4,120	6,508
136.10	4,269	6,928
136.20	4,419	7,362
136.30	4,569	7,812
136.40	4,718	8,276
136.50	4,868	8,755
136.60	5,017	9,250
136.70	5,166	9,759
136.80	5,316	10,283
136.90	5,466	10,822
137.00	**5,615**	**11,376**

Summary for Pond IC: Infiltration Facility C

Inflow Area = 148,366 sf, 96.82% Impervious, Inflow Depth > 3.82" for 10-year event
Inflow = 8.10 cfs @ 12.08 hrs, Volume= 47,241 cf
Outflow = 3.74 cfs @ 12.33 hrs, Volume= 47,260 cf, Atten= 54%, Lag= 15.1 min
Discarded = 0.62 cfs @ 9.95 hrs, Volume= 34,956 cf
Primary = 3.12 cfs @ 12.33 hrs, Volume= 12,304 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 138.74' @ 12.33 hrs Surf.Area= 11,888 sf Storage= 12,516 cf
Flood Elev= 139.33' Surf.Area= 11,888 sf Storage= 15,325 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 90.1 min (862.3 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	137.00'	8,265 cf	**54.83'W x 216.80'L x 2.33'H Field A** 27,738 cf Overall - 7,076 cf Embedded = 20,662 cf x 40.0% Voids
#2A	137.50'	7,076 cf	**ADS_StormTech SC-310 +Cap** x 480 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 16 Rows of 30 Chambers
		15,341 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	**24.0" Round Culvert** L= 130.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 136.00' S= 0.0154 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	137.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.62 cfs @ 9.95 hrs HW=137.03' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.62 cfs)

Primary OutFlow Max=3.11 cfs @ 12.33 hrs HW=138.74' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 3.11 cfs @ 2.93 fps)

Pond IC: Infiltration Facility C - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

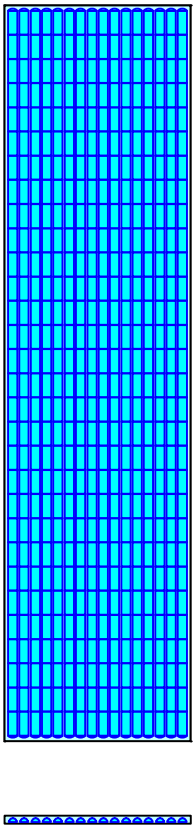
30 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 214.80' Row Length +12.0" End Stone x 2 = 216.80' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

480 Chambers x 14.7 cf = 7,076.1 cf Chamber Storage

27,738.4 cf Field - 7,076.1 cf Chambers = 20,662.2 cf Stone x 40.0% Voids = 8,264.9 cf Stone Storage

Chamber Storage + Stone Storage = 15,341.0 cf = 0.352 af
Overall Storage Efficiency = 55.3%
Overall System Size = 216.80' x 54.83' x 2.33'

480 Chambers
1,027.3 cy Field
765.3 cy Stone



Stage-Area-Storage for Pond IC: Infiltration Facility C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
137.00	**11,888**	0
137.05	11,888	238
137.10	11,888	476
137.15	11,888	713
137.20	11,888	951
137.25	11,888	1,189
137.30	11,888	1,427
137.35	11,888	1,664
137.40	11,888	1,902
137.45	11,888	2,140
137.50	11,888	2,378
137.55	11,888	2,862
137.60	11,888	3,345
137.65	11,888	3,824
137.70	11,888	4,301
137.75	11,888	4,773
137.80	11,888	5,241
137.85	11,888	5,704
137.90	11,888	6,162
137.95	11,888	6,614
138.00	11,888	7,059
138.05	11,888	7,499
138.10	11,888	7,932
138.15	11,888	8,358
138.20	11,888	8,777
138.25	11,888	9,187
138.30	11,888	9,588
138.35	11,888	9,979
138.40	11,888	10,358
138.45	11,888	10,726
138.50	11,888	11,079
138.55	11,888	11,414
138.60	11,888	11,725
138.65	11,888	12,016
138.70	11,888	12,289
138.75	11,888	12,551
138.80	11,888	12,802
138.85	11,888	13,043
138.90	11,888	13,280
138.95	11,888	13,518
139.00	11,888	13,756
139.05	11,888	13,994
139.10	11,888	14,231
139.15	11,888	14,469
139.20	11,888	14,707
139.25	11,888	14,945
139.30	11,888	**15,183**
139.35	11,888	**15,341**
139.40	11,888	15,341
139.45	11,888	15,341
139.50	11,888	15,341
139.55	11,888	15,341
139.60	11,888	15,341
139.65	11,888	15,341
139.70	11,888	15,341
139.75	11,888	15,341
139.80	11,888	15,341
139.85	11,888	15,341
139.90	11,888	15,341
139.95	11,888	15,341
140.00	11,888	15,341

Summary for Pond PDMH-06: PDMH-06

Inflow Area = 122,014 sf, 96.13% Impervious, Inflow Depth > 4.51" for 10-year event
Inflow = 13.15 cfs @ 12.09 hrs, Volume= 45,876 cf
Outflow = 13.15 cfs @ 12.09 hrs, Volume= 45,876 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.24 cfs @ 12.08 hrs, Volume= 37,161 cf
Secondary = 7.92 cfs @ 12.09 hrs, Volume= 8,715 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 140.16' @ 12.09 hrs
Flood Elev= 143.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	**12.0" Round Culvert** L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	138.55'	**18.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.55' / 137.50' S= 0.0420 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=4.94 cfs @ 12.08 hrs HW=140.08' TW=138.37' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 4.94 cfs @ 6.29 fps)

Secondary OutFlow Max=7.68 cfs @ 12.09 hrs HW=140.11' TW=136.68' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 7.68 cfs @ 4.35 fps)

Stage-Area-Storage for Pond PDMH-06: PDMH-06

Elevation (feet)	Storage (cubic-feet)
137.50	**0**
137.60	0
137.70	0
137.80	0
137.90	0
138.00	0
138.10	0
138.20	0
138.30	0
138.40	0
138.50	0
138.60	0
138.70	0
138.80	0
138.90	0
139.00	0
139.10	0
139.20	0
139.30	0
139.40	0
139.50	0
139.60	0
139.70	0
139.80	0
139.90	0
140.00	0
140.10	0
140.20	0
140.30	0
140.40	0
140.50	0
140.60	0
140.70	0
140.80	0
140.90	0
141.00	0
141.10	0
141.20	0
141.30	0
141.40	0
141.50	0
141.60	0
141.70	0
141.80	0
141.90	0
142.00	0
142.10	0
142.20	0
142.30	0
142.40	0
142.50	0
142.60	0
142.70	0
142.80	0
142.90	0
143.00	0
143.10	0
143.20	0
143.30	0
143.40	0
143.50	0
143.60	0
143.70	0
143.80	0
143.90	0

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 2.58" for 10-year event
Inflow = 29.06 cfs @ 12.90 hrs, Volume= 279,409 cf
Primary = 29.06 cfs @ 12.90 hrs, Volume= 279,409 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment AP: Additional parking Runoff Area=122,014 sf 96.13% Impervious Runoff Depth>5.70"
Tc=6.0 min CN=97 Runoff=16.52 cfs 57,971 cf

Subcatchment DW: Direct to Wetland Runoff Area=1,029,991 sf 1.13% Impervious Runoff Depth=3.65"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=36.35 cfs 312,904 cf

Subcatchment ER: Entrance Road Runoff Area=23,348 sf 98.74% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=98 Runoff=3.18 cfs 11,233 cf

Subcatchment NP: New parking area Runoff Area=54,700 sf 91.41% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=96 Runoff=7.36 cfs 25,610 cf

Subcatchment R: Roof Runoff Area=26,352 sf 100.00% Impervious Runoff Depth>5.77"
Tc=6.0 min CN=98 Runoff=3.58 cfs 12,678 cf

Subcatchment WP: West Parking Runoff Area=45,632 sf 57.82% Impervious Runoff Depth>5.02"
Tc=6.0 min CN=90 Runoff=5.74 cfs 19,088 cf

Reach 2R: Total Offsite Inflow=41.02 cfs 394,368 cf
Outflow=41.02 cfs 394,368 cf

Pond GW-1: Gravel Wetland #1 Peak Elev=137.90' Storage=24,416 cf Inflow=19.72 cfs 43,754 cf
Outflow=6.81 cfs 38,713 cf

Pond GW-2: Gravel Wetland #2 Peak Elev=135.61' Storage=5,009 cf Inflow=7.36 cfs 25,610 cf
Outflow=6.24 cfs 23,842 cf

Pond IC: Infiltration Facility C Peak Elev=138.99' Storage=13,718 cf Inflow=9.31 cfs 57,216 cf
Discarded=0.62 cfs 38,319 cf Primary=5.27 cfs 18,909 cf Outflow=5.89 cfs 57,228 cf

Pond PDMH-06: PDMH-06 Peak Elev=140.91' Inflow=16.52 cfs 57,971 cf
Primary=5.73 cfs 44,538 cf Secondary=10.80 cfs 13,433 cf Outflow=16.52 cfs 57,971 cf

Link PA1: Inflow=41.02 cfs 394,368 cf
Primary=41.02 cfs 394,368 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 439,484 cf Average Runoff Depth = 4.05"
80.44% Pervious = 1,047,309 sf 19.56% Impervious = 254,728 sf

Summary for Subcatchment AP: Additional parking area

Runoff = 16.52 cfs @ 12.09 hrs, Volume= 57,971 cf, Depth> 5.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
4,720	80	>75% Grass cover, Good, HSG D
84,164	98	Paved parking, HSG D
33,130	98	Roofs, HSG D
122,014	97	Weighted Average
4,720		3.87% Pervious Area
117,294		96.13% Impervious Area

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

Summary for Subcatchment DW: Direct to Wetland

Runoff = 36.35 cfs @ 12.92 hrs, Volume= 312,904 cf, Depth= 3.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	878	48	Brush, Good, HSG B
	15,473	73	Brush, Good, HSG D
	13,695	89	Dirt roads, HSG D
	1,434	91	Gravel roads, HSG D
	270	98	Paved roads w/curbs & sewers, HSG A
	2,827	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,687	30	Woods, Good, HSG A
	200	55	Woods, Good, HSG B
	202,405	77	Woods, Good, HSG D
	596	61	>75% Grass cover, Good, HSG B
	42,032	80	>75% Grass cover, Good, HSG D
	1,547	98	Unconnected roofs, HSG D
	7,000	98	Unconnected pavement, HSG D
	1,029,991	77	Weighted Average
	1,018,347		98.87% Pervious Area
	11,644		1.13% Impervious Area
	8,547		73.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Subcatchment ER: Entrance Road

Runoff = 3.18 cfs @ 12.09 hrs, Volume= 11,233 cf, Depth> 5.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
295	80	>75% Grass cover, Good, HSG D
23,053	98	Paved roads w/curbs & sewers, HSG D
23,348	98	Weighted Average
295		1.26% Pervious Area
23,053		98.74% Impervious Area

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

Summary for Subcatchment NP: New parking area

Runoff = 7.36 cfs @ 12.09 hrs, Volume= 25,610 cf, Depth> 5.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
4,700	80	>75% Grass cover, Good, HSG D
50,000	98	Paved parking, HSG D
54,700	96	Weighted Average
4,700		8.59% Pervious Area
50,000		91.41% Impervious Area

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

Summary for Subcatchment R: Roof

Runoff = 3.58 cfs @ 12.09 hrs, Volume= 12,678 cf, Depth> 5.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
26,352	98	Roofs, HSG D
26,352		100.00% Impervious Area

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

Summary for Subcatchment WP: West Parking

Runoff = 5.74 cfs @ 12.09 hrs, Volume= 19,088 cf, Depth> 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
19,247	80	>75% Grass cover, Good, HSG D
26,385	98	Paved roads w/curbs & sewers, HSG D
45,632	90	Weighted Average
19,247		42.18% Pervious Area
26,385		57.82% Impervious Area

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

Summary for Reach 2R: Total Offsite

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 3.63" for 25-year event
Inflow = 41.02 cfs @ 12.89 hrs, Volume= 394,368 cf
Outflow = 41.02 cfs @ 12.89 hrs, Volume= 394,368 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area = 68,980 sf, 71.67% Impervious, Inflow Depth > 7.61" for 25-year event
Inflow = 19.72 cfs @ 12.09 hrs, Volume= 43,754 cf
Outflow = 6.81 cfs @ 12.33 hrs, Volume= 38,713 cf, Atten= 65%, Lag= 14.8 min
Primary = 6.81 cfs @ 12.33 hrs, Volume= 38,713 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 137.90' @ 12.33 hrs Surf.Area= 10,328 sf Storage= 24,416 cf
Flood Elev= 139.50' Surf.Area= 13,553 sf Storage= 43,583 cf

Plug-Flow detention time= 463.2 min calculated for 38,708 cf (88% of inflow)
Center-of-Mass det. time= 416.9 min (1,178.5 - 761.6)

Volume	Invert	Avail.Storage	Storage Description
#1	132.50'	43,583 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.50	5,152	0.0	0	0
134.85	5,152	40.0	4,843	4,843
135.50	5,836	10.0	357	5,200
136.00	6,681	100.0	3,129	8,329
137.00	8,494	100.0	7,588	15,917
138.00	10,525	100.0	9,510	25,426
139.00	12,675	100.0	11,600	37,026
139.50	13,553	100.0	6,557	43,583

Device	Routing	Invert	Outlet Devices
#1	Primary	135.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.20' / 135.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	135.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	137.25'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	138.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.78 cfs @ 12.33 hrs HW=137.90' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 6.78 cfs of 16.58 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.26 cfs @ 7.76 fps)
  - **3=Sharp-Crested Rectangular Weir** (Orifice Controls 6.52 cfs @ 2.80 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-1: Gravel Wetland #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.50	5,152	0
132.60	5,152	206
132.70	5,152	412
132.80	5,152	618
132.90	5,152	824
133.00	5,152	1,030
133.10	5,152	1,236
133.20	5,152	1,443
133.30	5,152	1,649
133.40	5,152	1,855
133.50	5,152	2,061
133.60	5,152	2,267
133.70	5,152	2,473
133.80	5,152	2,679
133.90	5,152	2,885
134.00	5,152	3,091
134.10	5,152	3,297
134.20	5,152	3,503
134.30	5,152	3,709
134.40	5,152	3,916
134.50	5,152	4,122
134.60	5,152	4,328
134.70	5,152	4,534
134.80	5,152	4,740
134.90	5,205	4,869
135.00	5,310	4,921
135.10	5,415	4,975
135.20	5,520	5,030
135.30	5,626	5,085
135.40	5,731	5,142
135.50	5,836	5,200
135.60	6,005	5,792
135.70	6,174	6,401
135.80	6,343	7,027
135.90	6,512	7,670
136.00	6,681	8,329
136.10	6,862	9,006
136.20	7,044	9,702
136.30	7,225	10,415
136.40	7,406	11,147
136.50	7,588	11,896
136.60	7,769	12,664
136.70	7,950	13,450
136.80	8,131	14,254
136.90	8,313	15,076
137.00	8,494	15,917
137.10	8,697	16,776
137.20	8,900	17,656
137.30	9,103	18,556
137.40	9,306	19,477
137.50	9,510	20,418
137.60	9,713	21,379
137.70	9,916	22,360
137.80	10,119	23,362
137.90	10,322	24,384
138.00	10,525	25,426
138.10	10,740	26,489
138.20	10,955	27,574
138.30	11,170	28,680
138.40	11,385	29,808
138.50	11,600	30,957
138.60	11,815	32,128
138.70	12,030	33,320
138.80	12,245	34,534
138.90	12,460	35,769
139.00	12,675	37,026
139.10	12,851	38,303
139.20	13,026	39,596
139.30	13,202	40,908
139.40	13,377	42,237
139.50	**13,553**	**43,583**

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area = 54,700 sf, 91.41% Impervious, Inflow Depth > 5.62" for 25-year event
Inflow = 7.36 cfs @ 12.09 hrs, Volume= 25,610 cf
Outflow = 6.24 cfs @ 12.14 hrs, Volume= 23,842 cf, Atten= 15%, Lag= 3.3 min
Primary = 6.24 cfs @ 12.14 hrs, Volume= 23,842 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 135.61' @ 12.14 hrs Surf.Area= 3,593 sf Storage= 5,009 cf
Flood Elev= 137.00' Surf.Area= 5,615 sf Storage= 11,376 cf

Plug-Flow detention time= 112.3 min calculated for 23,835 cf (93% of inflow)
Center-of-Mass det. time= 74.2 min (841.1 - 766.8)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	11,376 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
131.50	1,810	0.0	0	0
133.85	1,810	40.0	1,701	1,701
134.50	2,175	10.0	130	1,831
135.00	2,765	100.0	1,235	3,066
136.00	4,120	100.0	3,443	6,508
137.00	5,615	100.0	4,868	11,376

Device	Routing	Invert	Outlet Devices
#1	Primary	134.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.20' / 134.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	134.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	135.00'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	136.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.17 cfs @ 12.14 hrs HW=135.61' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 6.17 cfs of 6.50 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 5.49 fps)
3=Sharp-Crested Rectangular Weir (Orifice Controls 5.98 cfs @ 2.57 fps)
4=Orifice/Grate (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-2: Gravel Wetland #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
131.50	1,810	0
131.60	1,810	72
131.70	1,810	145
131.80	1,810	217
131.90	1,810	290
132.00	1,810	362
132.10	1,810	434
132.20	1,810	507
132.30	1,810	579
132.40	1,810	652
132.50	1,810	724
132.60	1,810	796
132.70	1,810	869
132.80	1,810	941
132.90	1,810	1,014
133.00	1,810	1,086
133.10	1,810	1,158
133.20	1,810	1,231
133.30	1,810	1,303
133.40	1,810	1,376
133.50	1,810	1,448
133.60	1,810	1,520
133.70	1,810	1,593
133.80	1,810	1,665
133.90	1,838	1,711
134.00	1,894	1,729
134.10	1,950	1,748
134.20	2,007	1,768
134.30	2,063	1,789
134.40	2,119	1,809
134.50	2,175	1,831
134.60	2,293	2,054
134.70	2,411	2,290
134.80	2,529	2,537
134.90	2,647	2,795
135.00	2,765	3,066
135.10	2,900	3,349
135.20	3,036	3,646
135.30	3,172	3,956
135.40	3,307	4,280
135.50	3,443	4,618
135.60	3,578	4,969
135.70	3,713	5,333
135.80	3,849	5,712
135.90	3,985	6,103
136.00	4,120	6,508
136.10	4,269	6,928
136.20	4,419	7,362
136.30	4,569	7,812
136.40	4,718	8,276
136.50	4,868	8,755
136.60	5,017	9,250
136.70	5,166	9,759
136.80	5,316	10,283
136.90	5,466	10,822
137.00	**5,615**	**11,376**

Summary for Pond IC: Infiltration Facility C

Inflow Area = 148,366 sf, 96.82% Impervious, Inflow Depth > 4.63" for 25-year event
Inflow = 9.31 cfs @ 12.08 hrs, Volume= 57,216 cf
Outflow = 5.89 cfs @ 12.20 hrs, Volume= 57,228 cf, Atten= 37%, Lag= 6.9 min
Discarded = 0.62 cfs @ 9.15 hrs, Volume= 38,319 cf
Primary = 5.27 cfs @ 12.20 hrs, Volume= 18,909 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 138.99' @ 12.20 hrs Surf.Area= 11,888 sf Storage= 13,718 cf
Flood Elev= 139.33' Surf.Area= 11,888 sf Storage= 15,325 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 89.1 min (860.7 - 771.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	137.00'	8,265 cf	**54.83'W x 216.80'L x 2.33'H Field A** 27,738 cf Overall - 7,076 cf Embedded = 20,662 cf x 40.0% Voids
#2A	137.50'	7,076 cf	**ADS_StormTech SC-310 +Cap** x 480 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 16 Rows of 30 Chambers
		15,341 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	**24.0" Round Culvert** L= 130.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 136.00' S= 0.0154 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	137.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.62 cfs @ 9.15 hrs HW=137.03' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.62 cfs)

Primary OutFlow Max=5.27 cfs @ 12.20 hrs HW=138.99' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 5.27 cfs @ 3.39 fps)

Pond IC: Infiltration Facility C - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

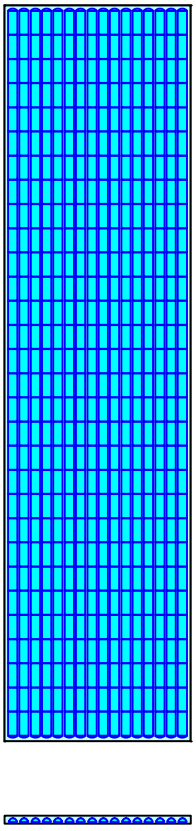
30 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 214.80' Row Length +12.0" End Stone x 2 = 216.80' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

480 Chambers x 14.7 cf = 7,076.1 cf Chamber Storage

27,738.4 cf Field - 7,076.1 cf Chambers = 20,662.2 cf Stone x 40.0% Voids = 8,264.9 cf Stone Storage

Chamber Storage + Stone Storage = 15,341.0 cf = 0.352 af
Overall Storage Efficiency = 55.3%
Overall System Size = 216.80' x 54.83' x 2.33'

480 Chambers
1,027.3 cy Field
765.3 cy Stone



Stage-Area-Storage for Pond IC: Infiltration Facility C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
137.00	**11,888**	0
137.05	11,888	238
137.10	11,888	476
137.15	11,888	713
137.20	11,888	951
137.25	11,888	1,189
137.30	11,888	1,427
137.35	11,888	1,664
137.40	11,888	1,902
137.45	11,888	2,140
137.50	11,888	2,378
137.55	11,888	2,862
137.60	11,888	3,345
137.65	11,888	3,824
137.70	11,888	4,301
137.75	11,888	4,773
137.80	11,888	5,241
137.85	11,888	5,704
137.90	11,888	6,162
137.95	11,888	6,614
138.00	11,888	7,059
138.05	11,888	7,499
138.10	11,888	7,932
138.15	11,888	8,358
138.20	11,888	8,777
138.25	11,888	9,187
138.30	11,888	9,588
138.35	11,888	9,979
138.40	11,888	10,358
138.45	11,888	10,726
138.50	11,888	11,079
138.55	11,888	11,414
138.60	11,888	11,725
138.65	11,888	12,016
138.70	11,888	12,289
138.75	11,888	12,551
138.80	11,888	12,802
138.85	11,888	13,043
138.90	11,888	13,280
138.95	11,888	13,518
139.00	11,888	13,756
139.05	11,888	13,994
139.10	11,888	14,231
139.15	11,888	14,469
139.20	11,888	14,707
139.25	11,888	14,945
139.30	11,888	**15,183**
139.35	11,888	**15,341**
139.40	11,888	15,341
139.45	11,888	15,341
139.50	11,888	15,341
139.55	11,888	15,341
139.60	11,888	15,341
139.65	11,888	15,341
139.70	11,888	15,341
139.75	11,888	15,341
139.80	11,888	15,341
139.85	11,888	15,341
139.90	11,888	15,341
139.95	11,888	15,341
140.00	11,888	15,341

Summary for Pond PDMH-06: PDMH-06

Inflow Area = 122,014 sf, 96.13% Impervious, Inflow Depth > 5.70" for 25-year event
Inflow = 16.52 cfs @ 12.09 hrs, Volume= 57,971 cf
Outflow = 16.52 cfs @ 12.09 hrs, Volume= 57,971 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.73 cfs @ 12.08 hrs, Volume= 44,538 cf
Secondary = 10.80 cfs @ 12.09 hrs, Volume= 13,433 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 140.91' @ 12.09 hrs
Flood Elev= 143.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	**12.0" Round Culvert** L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	138.55'	**18.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.55' / 137.50' S= 0.0420 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.36 cfs @ 12.08 hrs HW=140.79' TW=138.78' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 5.36 cfs @ 6.82 fps)

Secondary OutFlow Max=10.53 cfs @ 12.09 hrs HW=140.83' TW=137.26' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 10.53 cfs @ 5.96 fps)

Stage-Area-Storage for Pond PDMH-06: PDMH-06

Elevation (feet)	Storage (cubic-feet)
137.50	**0**
137.60	0
137.70	0
137.80	0
137.90	0
138.00	0
138.10	0
138.20	0
138.30	0
138.40	0
138.50	0
138.60	0
138.70	0
138.80	0
138.90	0
139.00	0
139.10	0
139.20	0
139.30	0
139.40	0
139.50	0
139.60	0
139.70	0
139.80	0
139.90	0
140.00	0
140.10	0
140.20	0
140.30	0
140.40	0
140.50	0
140.60	0
140.70	0
140.80	0
140.90	0
141.00	0
141.10	0
141.20	0
141.30	0
141.40	0
141.50	0
141.60	0
141.70	0
141.80	0
141.90	0
142.00	0
142.10	0
142.20	0
142.30	0
142.40	0
142.50	0
142.60	0
142.70	0
142.80	0
142.90	0
143.00	0
143.10	0
143.20	0
143.30	0
143.40	0
143.50	0
143.60	0
143.70	0
143.80	0
143.90	0

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 3.63" for 25-year event
Inflow = 41.02 cfs @ 12.89 hrs, Volume= 394,368 cf
Primary = 41.02 cfs @ 12.89 hrs, Volume= 394,368 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Time span=5.00-48.00 hrs, dt=0.05 hrs, 861 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment AP: Additional parking Runoff Area=122,014 sf 96.13% Impervious Runoff Depth>8.08"
Tc=6.0 min CN=97 Runoff=23.26 cfs 82,166 cf

Subcatchment DW: Direct to Wetland Runoff Area=1,029,991 sf 1.13% Impervious Runoff Depth=5.90"
Flow Length=2,362' Slope=0.0017 '/' Tc=69.5 min CN=77 Runoff=58.62 cfs 506,549 cf

Subcatchment ER: Entrance Road Runoff Area=23,348 sf 98.74% Impervious Runoff Depth>8.14"
Tc=6.0 min CN=98 Runoff=4.46 cfs 15,841 cf

Subcatchment NP: New parking area Runoff Area=54,700 sf 91.41% Impervious Runoff Depth>8.01"
Tc=6.0 min CN=96 Runoff=10.39 cfs 36,500 cf

Subcatchment R: Roof Runoff Area=26,352 sf 100.00% Impervious Runoff Depth>8.14"
Tc=6.0 min CN=98 Runoff=5.04 cfs 17,880 cf

Subcatchment WP: West Parking Runoff Area=45,632 sf 57.82% Impervious Runoff Depth>7.43"
Tc=6.0 min CN=90 Runoff=8.34 cfs 28,246 cf

Reach 2R: Total Offsite Inflow=66.19 cfs 637,014 cf
Outflow=66.19 cfs 637,014 cf

Pond GW-1: Gravel Wetland #1 Peak Elev=138.55' Storage=31,590 cf Inflow=28.73 cfs 67,462 cf
Outflow=16.39 cfs 62,415 cf

Pond GW-2: Gravel Wetland #2 Peak Elev=135.82' Storage=5,805 cf Inflow=10.39 cfs 36,500 cf
Outflow=8.32 cfs 34,732 cf

Pond IC: Infiltration Facility C Peak Elev=139.33' Storage=15,315 cf Inflow=12.37 cfs 76,671 cf
Discarded=0.62 cfs 43,402 cf Primary=8.69 cfs 33,318 cf Outflow=9.31 cfs 76,720 cf

Pond PDMH-06: PDMH-06 Peak Elev=142.79' Inflow=23.26 cfs 82,166 cf
Primary=7.34 cfs 58,791 cf Secondary=15.93 cfs 23,375 cf Outflow=23.26 cfs 82,166 cf

Link PA1: Inflow=66.19 cfs 637,014 cf
Primary=66.19 cfs 637,014 cf

Total Runoff Area = 1,302,037 sf Runoff Volume = 687,182 cf Average Runoff Depth = 6.33"
80.44% Pervious = 1,047,309 sf 19.56% Impervious = 254,728 sf

Summary for Subcatchment AP: Additional parking area

Runoff = 23.26 cfs @ 12.09 hrs, Volume= 82,166 cf, Depth> 8.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

Area (sf)	CN	Description
4,720	80	>75% Grass cover, Good, HSG D
84,164	98	Paved parking, HSG D
33,130	98	Roofs, HSG D
122,014	97	Weighted Average
4,720		3.87% Pervious Area
117,294		96.13% Impervious Area

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

Summary for Subcatchment DW: Direct to Wetland

Runoff = 58.62 cfs @ 12.91 hrs, Volume= 506,549 cf, Depth= 5.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

	Area (sf)	CN	Description
	6,761	30	Brush, Good, HSG A
	878	48	Brush, Good, HSG B
	15,473	73	Brush, Good, HSG D
	13,695	89	Dirt roads, HSG D
	1,434	91	Gravel roads, HSG D
	270	98	Paved roads w/curbs & sewers, HSG A
	2,827	98	Paved roads w/curbs & sewers, HSG D
*	173	78	Wetlands, HSG A
*	720,013	78	Wetlands, HSG D
	14,687	30	Woods, Good, HSG A
	200	55	Woods, Good, HSG B
	202,405	77	Woods, Good, HSG D
	596	61	>75% Grass cover, Good, HSG B
	42,032	80	>75% Grass cover, Good, HSG D
	1,547	98	Unconnected roofs, HSG D
	7,000	98	Unconnected pavement, HSG D
	1,029,991	77	Weighted Average
	1,018,347		98.87% Pervious Area
	11,644		1.13% Impervious Area
	8,547		73.40% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	5	0.0017	0.01		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.35"
3.6	45	0.0017	0.21		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.6	341	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
0.2	51	0.0017	3.51	11.02	**Pipe Channel,** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.011 Concrete pipe, straight & clean
48.2	1,920	0.0017	0.66		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
69.5	2,362	Total			

Summary for Subcatchment ER: Entrance Road

Runoff = 4.46 cfs @ 12.09 hrs, Volume= 15,841 cf, Depth> 8.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

Area (sf)	CN	Description
295	80	>75% Grass cover, Good, HSG D
23,053	98	Paved roads w/curbs & sewers, HSG D
23,348	98	Weighted Average
295		1.26% Pervious Area
23,053		98.74% Impervious Area

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

Summary for Subcatchment NP: New parking area

Runoff = 10.39 cfs @ 12.09 hrs, Volume= 36,500 cf, Depth> 8.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

Area (sf)	CN	Description
4,700	80	>75% Grass cover, Good, HSG D
50,000	98	Paved parking, HSG D
54,700	96	Weighted Average
4,700		8.59% Pervious Area
50,000		91.41% Impervious Area

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

Summary for Subcatchment R: Roof

Runoff = 5.04 cfs @ 12.09 hrs, Volume= 17,880 cf, Depth> 8.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

Area (sf)	CN	Description
26,352	98	Roofs, HSG D
26,352		100.00% Impervious Area

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

Summary for Subcatchment WP: West Parking

Runoff = 8.34 cfs @ 12.09 hrs, Volume= 28,246 cf, Depth> 7.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-year Rainfall=8.68"

Area (sf)	CN	Description
19,247	80	>75% Grass cover, Good, HSG D
26,385	98	Paved roads w/curbs & sewers, HSG D
45,632	90	Weighted Average
19,247		42.18% Pervious Area
26,385		57.82% Impervious Area

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

Summary for Reach 2R: Total Offsite

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 5.87" for 100-year event
Inflow = 66.19 cfs @ 12.84 hrs, Volume= 637,014 cf
Outflow = 66.19 cfs @ 12.84 hrs, Volume= 637,014 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Summary for Pond GW-1: Gravel Wetland #1

Inflow Area = 68,980 sf, 71.67% Impervious, Inflow Depth > 11.74" for 100-year event
Inflow = 28.73 cfs @ 12.09 hrs, Volume= 67,462 cf
Outflow = 16.39 cfs @ 12.22 hrs, Volume= 62,415 cf, Atten= 43%, Lag= 7.7 min
Primary = 16.39 cfs @ 12.22 hrs, Volume= 62,415 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 138.55' @ 12.22 hrs Surf.Area= 11,717 sf Storage= 31,590 cf
Flood Elev= 139.50' Surf.Area= 13,553 sf Storage= 43,583 cf

Plug-Flow detention time= 328.1 min calculated for 62,405 cf (93% of inflow)
Center-of-Mass det. time= 293.3 min (1,049.6 - 756.3)

Volume	Invert	Avail.Storage	Storage Description
#1	132.50'	43,583 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
132.50	5,152	0.0	0	0
134.85	5,152	40.0	4,843	4,843
135.50	5,836	10.0	357	5,200
136.00	6,681	100.0	3,129	8,329
137.00	8,494	100.0	7,588	15,917
138.00	10,525	100.0	9,510	25,426
139.00	12,675	100.0	11,600	37,026
139.50	13,553	100.0	6,557	43,583

Device	Routing	Invert	Outlet Devices
#1	Primary	135.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.20' / 135.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	135.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	137.25'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	138.50'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=15.72 cfs @ 12.22 hrs HW=138.54' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 15.72 cfs of 22.58 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 8.67 fps)
  - **3=Sharp-Crested Rectangular Weir** (Orifice Controls 11.33 cfs @ 4.87 fps)
  - **4=Orifice/Grate** (Weir Controls 4.09 cfs @ 0.68 fps)

Stage-Area-Storage for Pond GW-1: Gravel Wetland #1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
132.50	5,152	0
132.60	5,152	206
132.70	5,152	412
132.80	5,152	618
132.90	5,152	824
133.00	5,152	1,030
133.10	5,152	1,236
133.20	5,152	1,443
133.30	5,152	1,649
133.40	5,152	1,855
133.50	5,152	2,061
133.60	5,152	2,267
133.70	5,152	2,473
133.80	5,152	2,679
133.90	5,152	2,885
134.00	5,152	3,091
134.10	5,152	3,297
134.20	5,152	3,503
134.30	5,152	3,709
134.40	5,152	3,916
134.50	5,152	4,122
134.60	5,152	4,328
134.70	5,152	4,534
134.80	5,152	4,740
134.90	5,205	4,869
135.00	5,310	4,921
135.10	5,415	4,975
135.20	5,520	5,030
135.30	5,626	5,085
135.40	5,731	5,142
135.50	5,836	5,200
135.60	6,005	5,792
135.70	6,174	6,401
135.80	6,343	7,027
135.90	6,512	7,670
136.00	6,681	8,329
136.10	6,862	9,006
136.20	7,044	9,702
136.30	7,225	10,415
136.40	7,406	11,147
136.50	7,588	11,896
136.60	7,769	12,664
136.70	7,950	13,450
136.80	8,131	14,254
136.90	8,313	15,076
137.00	8,494	15,917
137.10	8,697	16,776
137.20	8,900	17,656
137.30	9,103	18,556
137.40	9,306	19,477
137.50	9,510	20,418
137.60	9,713	21,379
137.70	9,916	22,360
137.80	10,119	23,362
137.90	10,322	24,384
138.00	10,525	25,426
138.10	10,740	26,489
138.20	10,955	27,574
138.30	11,170	28,680
138.40	11,385	29,808
138.50	11,600	30,957
138.60	11,815	32,128
138.70	12,030	33,320
138.80	12,245	34,534
138.90	12,460	35,769
139.00	12,675	37,026
139.10	12,851	38,303
139.20	13,026	39,596
139.30	13,202	40,908
139.40	13,377	42,237
139.50	**13,553**	**43,583**

Summary for Pond GW-2: Gravel Wetland #2

Inflow Area = 54,700 sf, 91.41% Impervious, Inflow Depth > 8.01" for 100-year event
Inflow = 10.39 cfs @ 12.09 hrs, Volume= 36,500 cf
Outflow = 8.32 cfs @ 12.15 hrs, Volume= 34,732 cf, Atten= 20%, Lag= 3.8 min
Primary = 8.32 cfs @ 12.15 hrs, Volume= 34,732 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 135.82' @ 12.15 hrs Surf.Area= 3,882 sf Storage= 5,805 cf
Flood Elev= 137.00' Surf.Area= 5,615 sf Storage= 11,376 cf

Plug-Flow detention time= 90.0 min calculated for 34,721 cf (95% of inflow)
Center-of-Mass det. time= 61.1 min (824.8 - 763.6)

Volume	Invert	Avail.Storage	Storage Description
#1	131.50'	11,376 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
131.50	1,810	0.0	0	0
133.85	1,810	40.0	1,701	1,701
134.50	2,175	10.0	130	1,831
135.00	2,765	100.0	1,235	3,066
136.00	4,120	100.0	3,443	6,508
137.00	5,615	100.0	4,868	11,376

Device	Routing	Invert	Outlet Devices
#1	Primary	134.20'	**24.0" Round Culvert** L= 19.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 134.20' / 134.15' S= 0.0026 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	134.20'	**2.5" Vert. Orifice/Grate** C= 0.600
#3	Device 1	135.00'	**4.0' long x 0.60' rise Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#4	Device 1	136.00'	**4.0" x 4.0" Horiz. Orifice/Grate X 106.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.32 cfs @ 12.15 hrs HW=135.82' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 8.32 cfs @ 4.15 fps)
↑**2=Orifice/Grate** (Passes < 0.20 cfs potential flow)
3=Sharp-Crested Rectangular Weir (Passes < 8.14 cfs potential flow)
4=Orifice/Grate (Controls 0.00 cfs)

Stage-Area-Storage for Pond GW-2: Gravel Wetland #2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
131.50	1,810	0
131.60	1,810	72
131.70	1,810	145
131.80	1,810	217
131.90	1,810	290
132.00	1,810	362
132.10	1,810	434
132.20	1,810	507
132.30	1,810	579
132.40	1,810	652
132.50	1,810	724
132.60	1,810	796
132.70	1,810	869
132.80	1,810	941
132.90	1,810	1,014
133.00	1,810	1,086
133.10	1,810	1,158
133.20	1,810	1,231
133.30	1,810	1,303
133.40	1,810	1,376
133.50	1,810	1,448
133.60	1,810	1,520
133.70	1,810	1,593
133.80	1,810	1,665
133.90	1,838	1,711
134.00	1,894	1,729
134.10	1,950	1,748
134.20	2,007	1,768
134.30	2,063	1,789
134.40	2,119	1,809
134.50	2,175	1,831
134.60	2,293	2,054
134.70	2,411	2,290
134.80	2,529	2,537
134.90	2,647	2,795
135.00	2,765	3,066
135.10	2,900	3,349
135.20	3,036	3,646
135.30	3,172	3,956
135.40	3,307	4,280
135.50	3,443	4,618
135.60	3,578	4,969
135.70	3,713	5,333
135.80	3,849	5,712
135.90	3,985	6,103
136.00	4,120	6,508
136.10	4,269	6,928
136.20	4,419	7,362
136.30	4,569	7,812
136.40	4,718	8,276
136.50	4,868	8,755
136.60	5,017	9,250
136.70	5,166	9,759
136.80	5,316	10,283
136.90	5,466	10,822
137.00	**5,615**	**11,376**

Summary for Pond IC: Infiltration Facility C

Inflow Area = 148,366 sf, 96.82% Impervious, Inflow Depth > 6.20" for 100-year event
Inflow = 12.37 cfs @ 12.08 hrs, Volume= 76,671 cf
Outflow = 9.31 cfs @ 12.16 hrs, Volume= 76,720 cf, Atten= 25%, Lag= 4.5 min
Discarded = 0.62 cfs @ 8.10 hrs, Volume= 43,402 cf
Primary = 8.69 cfs @ 12.16 hrs, Volume= 33,318 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 139.33' @ 12.16 hrs Surf.Area= 11,888 sf Storage= 15,315 cf
Flood Elev= 139.33' Surf.Area= 11,888 sf Storage= 15,325 cf

Plug-Flow detention time= 88.2 min calculated for 76,631 cf (100% of inflow)
Center-of-Mass det. time= 88.6 min (860.0 - 771.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	137.00'	8,265 cf	**54.83'W x 216.80'L x 2.33'H Field A** 27,738 cf Overall - 7,076 cf Embedded = 20,662 cf x 40.0% Voids
#2A	137.50'	7,076 cf	**ADS_StormTech SC-310 +Cap** x 480 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 16 Rows of 30 Chambers
		15,341 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	138.00'	**24.0" Round Culvert** L= 130.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.00' / 136.00' S= 0.0154 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	137.00'	**2.250 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.62 cfs @ 8.10 hrs HW=137.03' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.62 cfs)

Primary OutFlow Max=8.60 cfs @ 12.16 hrs HW=139.32' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 8.60 cfs @ 3.91 fps)

Pond IC: Infiltration Facility C - Chamber Wizard Field A

Chamber Model = ADS_StormTech SC-310 +Cap (ADS StormTech® SC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

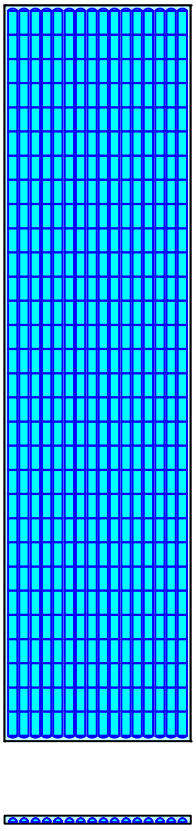
30 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 214.80' Row Length +12.0" End Stone x 2 = 216.80' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

480 Chambers x 14.7 cf = 7,076.1 cf Chamber Storage

27,738.4 cf Field - 7,076.1 cf Chambers = 20,662.2 cf Stone x 40.0% Voids = 8,264.9 cf Stone Storage

Chamber Storage + Stone Storage = 15,341.0 cf = 0.352 af
Overall Storage Efficiency = 55.3%
Overall System Size = 216.80' x 54.83' x 2.33'

480 Chambers
1,027.3 cy Field
765.3 cy Stone



Stage-Area-Storage for Pond IC: Infiltration Facility C

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
137.00	**11,888**	0
137.05	11,888	238
137.10	11,888	476
137.15	11,888	713
137.20	11,888	951
137.25	11,888	1,189
137.30	11,888	1,427
137.35	11,888	1,664
137.40	11,888	1,902
137.45	11,888	2,140
137.50	11,888	2,378
137.55	11,888	2,862
137.60	11,888	3,345
137.65	11,888	3,824
137.70	11,888	4,301
137.75	11,888	4,773
137.80	11,888	5,241
137.85	11,888	5,704
137.90	11,888	6,162
137.95	11,888	6,614
138.00	11,888	7,059
138.05	11,888	7,499
138.10	11,888	7,932
138.15	11,888	8,358
138.20	11,888	8,777
138.25	11,888	9,187
138.30	11,888	9,588
138.35	11,888	9,979
138.40	11,888	10,358
138.45	11,888	10,726
138.50	11,888	11,079
138.55	11,888	11,414
138.60	11,888	11,725
138.65	11,888	12,016
138.70	11,888	12,289
138.75	11,888	12,551
138.80	11,888	12,802
138.85	11,888	13,043
138.90	11,888	13,280
138.95	11,888	13,518
139.00	11,888	13,756
139.05	11,888	13,994
139.10	11,888	14,231
139.15	11,888	14,469
139.20	11,888	14,707
139.25	11,888	14,945
139.30	11,888	**15,183**
139.35	11,888	**15,341**
139.40	11,888	15,341
139.45	11,888	15,341
139.50	11,888	15,341
139.55	11,888	15,341
139.60	11,888	15,341
139.65	11,888	15,341
139.70	11,888	15,341
139.75	11,888	15,341
139.80	11,888	15,341
139.85	11,888	15,341
139.90	11,888	15,341
139.95	11,888	15,341
140.00	11,888	15,341

Summary for Pond PDMH-06: PDMH-06

Inflow Area = 122,014 sf, 96.13% Impervious, Inflow Depth > 8.08" for 100-year event
Inflow = 23.26 cfs @ 12.09 hrs, Volume= 82,166 cf
Outflow = 23.26 cfs @ 12.09 hrs, Volume= 82,166 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.34 cfs @ 12.08 hrs, Volume= 58,791 cf
Secondary = 15.93 cfs @ 12.09 hrs, Volume= 23,375 cf

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 142.79' @ 12.09 hrs
Flood Elev= 143.95'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	**12.0" Round Culvert** L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	138.55'	**18.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.55' / 137.50' S= 0.0420 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=6.96 cfs @ 12.08 hrs HW=142.59' TW=139.20' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 6.96 cfs @ 8.87 fps)

Secondary OutFlow Max=15.52 cfs @ 12.09 hrs HW=142.63' TW=138.13' (Dynamic Tailwater)
↑—**2=Culvert** (Inlet Controls 15.52 cfs @ 8.78 fps)

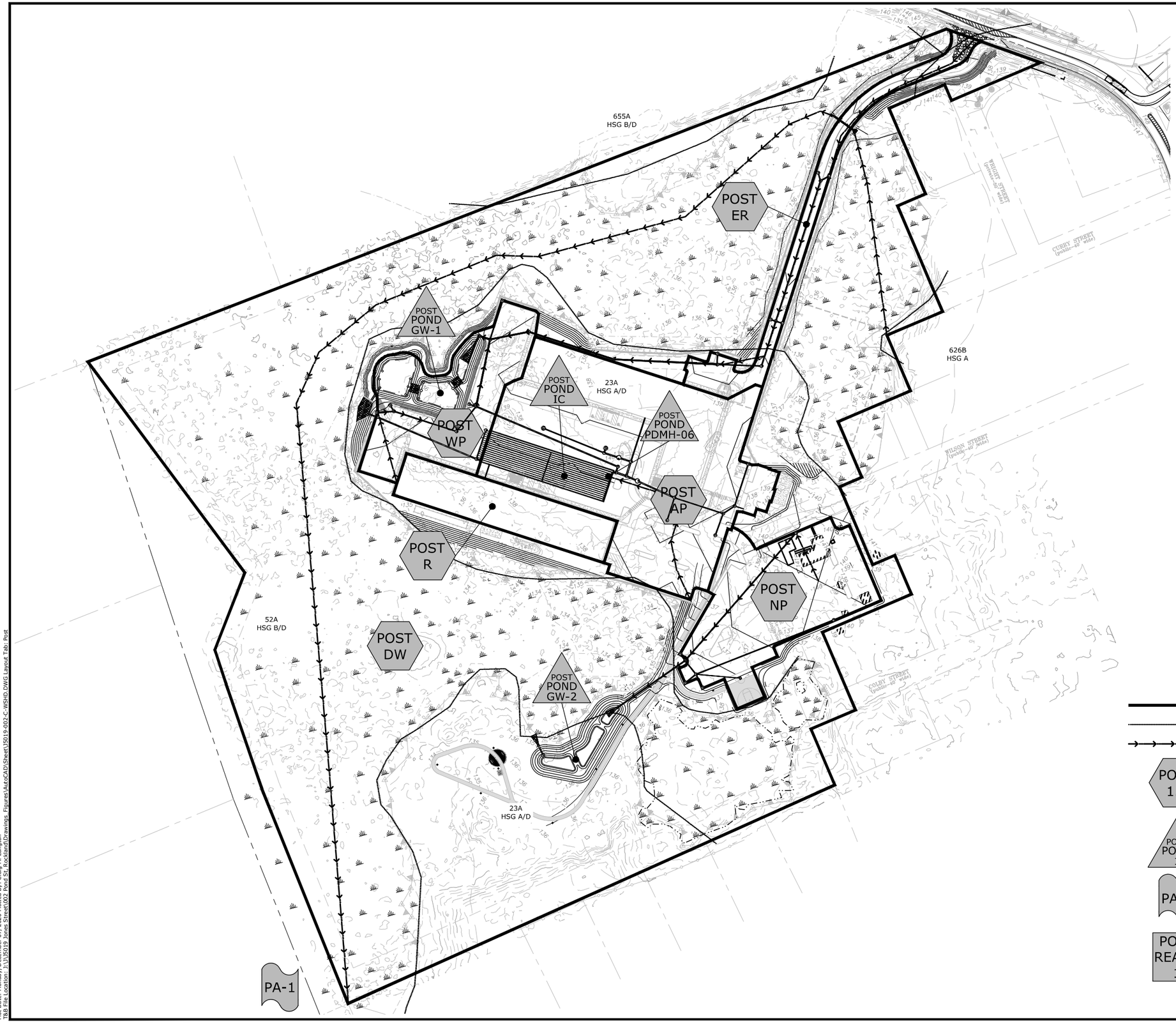
Stage-Area-Storage for Pond PDMH-06: PDMH-06

Elevation (feet)	Storage (cubic-feet)
137.50	**0**
137.60	0
137.70	0
137.80	0
137.90	0
138.00	0
138.10	0
138.20	0
138.30	0
138.40	0
138.50	0
138.60	0
138.70	0
138.80	0
138.90	0
139.00	0
139.10	0
139.20	0
139.30	0
139.40	0
139.50	0
139.60	0
139.70	0
139.80	0
139.90	0
140.00	0
140.10	0
140.20	0
140.30	0
140.40	0
140.50	0
140.60	0
140.70	0
140.80	0
140.90	0
141.00	0
141.10	0
141.20	0
141.30	0
141.40	0
141.50	0
141.60	0
141.70	0
141.80	0
141.90	0
142.00	0
142.10	0
142.20	0
142.30	0
142.40	0
142.50	0
142.60	0
142.70	0
142.80	0
142.90	0
143.00	0
143.10	0
143.20	0
143.30	0
143.40	0
143.50	0
143.60	0
143.70	0
143.80	0
143.90	0

Summary for Link PA1:

Inflow Area = 1,302,037 sf, 19.56% Impervious, Inflow Depth = 5.87" for 100-year event
Inflow = 66.19 cfs @ 12.84 hrs, Volume= 637,014 cf
Primary = 66.19 cfs @ 12.84 hrs, Volume= 637,014 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs



LEGEND

- POST-DEVELOPMENT WATERSHED BOUNDARY
- WEB SOIL SURVEY BOUNDARIES
- LONGEST FLOW PATH
- POST 1.0 — PRE DEVELOPMENT WATERSHED AREA DESIGNATION
- POST POND 1 — POST-DEVELOPMENT POND DESIGNATION
- PA-1 — POINT OF ANALYSIS
- POST REACH 1 — POST-DEVELOPMENT REACH DESIGNATION

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SCALE IN FEET
0 80' 160'
GRAPHIC SCALE

Shingle Mill Multi-Family Development

Shinglemill, LLC

75 - 79 Pond Street
Rockland,
Massachusetts

MARK	DATE	DESCRIPTION
B	12/8/2020	Supplemental Comprehensive Permit - 2
A	7/13/2020	Submitted for Comprehensive Permit

PROJECT NO:	J5019-002
DATE:	7/13/2020
FILE:	J5019-002-C-WSHD.DWG
DRAWN BY:	CML
CHECKED:	PMC
APPROVED:	BLM

POST-DEVELOPMENT WATERSHED PLAN

SCALE: AS SHOWN

C-802

Last Save Date: December 4, 2020 4:16 PM By: CML
Plot Date: Wednesday, December 02, 2020 Plotted By: Craig M. Langton
TRB File Location: J:\J5019 Jones Street\002 Pond St, Rockland\Drawings, Figures\AutoCAD\Sheet\J5019-002-C-WSHD.DWG Layout Tab: Post

2.4 Peak Rate Comparisons

The following table summarizes and compares the pre- and post-development peak runoff rates and total volume for the 2-year, 10-year, 25-year and 100-year storm events.

Table 2.4.1 – Comparison of Peak Flow Rates & Total Volume

	Existing Conditions		Proposed Conditions		Net Change	
Storm Frequency	Peak Runoff (CFS)	Total Volume (CF)	Peak Runoff (CFS)	Total Volume (CF)	Peak Runoff (CFS)	Total Volume (CF)
2-Year	16.06	143,234	14.12	142,229	-1.94	-1,005
10-Year	32.35	280,070	29.06	279,409	-3.29	-661
25-Year	45.95	395,550	41.02	394,368	-4.93	-1,182
100-Year	74.10	640,341	66.19	637,014	-7.91	-3,327

2.5 Mitigation Description

2.0.1 Mitigation Calculations

The proposed project area has been evaluated to provide treatment for the required water quality volume (WQV) and groundwater recharge volume (GRV) per the requirements of the Massachusetts DEP Stormwater Handbook. These calculations have been provided above. The required groundwater recharge volumes (GRV) and water quality volumes (WQV) have been provided below outlets.

2.0.2 Pre-Treatment Methods for Protecting Water Quality

Pre-treatment for the proposed gravel wetland is provided by deep sump catchbasins with hoods and a sediment forebay. Pre-treatment for the underground infiltration chamber system includes deep sump catchbasins with hoods and proprietary separators.

2.0.3 Treatment Methods for Protecting Water Quality

Treatment for the increased impervious area comes from one gravel wetland and one subsurface infiltration chamber system. Water quality volume (WQV) calculations for each treatment system are below:

Table 2.5.1 – Proposed Treatment Areas
Water Quality Volume Calculations

DESCRIPTION	VALUE
On-Site Required Water Quality Volume	**22,488 CF**
Water Quality Volume, Gravel Wetland #1	**13,850 CF**
Water Quality Volume, Gravel Wetland #2	**2,413CF**
Water Quality Volume, Infiltration Chambers	**7,059 CF**
Total Water Quality Volume	**23,322 CF**

2.6 Conclusion

Based on the HydroCAD analysis for the 2, 10, 25 and 100-year storm events, the peak rate of runoff and total runoff volume has decreased from the existing to the proposed condition. Furthermore, the required Water Quality Volume and Recharge Volume have been and infiltrated and treated thereby promoting/preserving the natural hydrologic conditions. In addition to these improvements, all 10 of the DEP Stormwater Standards have been met.

Section 3
Long Term Pollution Prevention, Operation & Maintenance Plan

It is the intent of this Long-Term Pollution Prevention, Operation and Maintenance Plan to identify the areas of this site that need special attention and consideration, as well as implementing a plan to assure routine maintenance. By identifying the areas of concern as well as implementing a frequent and routine maintenance schedule the site will maintain a high-quality stormwater runoff.

To keep the Stormwater Management System functioning properly and to ensure that the stormwater Total Suspended Solids (TSS) are reduced, a long-term pollution prevention is required. The owner/operator of the facility is responsible for the adherence to this long-term plan. The following is a guideline of the specific requirements of the plan to maintain the long-term viability of the stormwater management system.

3.1 Contact/Responsible Party

Jones Street Residential
100 High Street, Suite 2500
Boston, Massachusetts 02110

(Note: The contact information for the Contact/Responsible Party shall be kept current. If ownership changes, the Operation and Maintenance Plan must be transferred to the new party.)

3.2 Maintenance Items

Maintenance of the following items shall be recorded:

- Litter/Debris Removal
- Landscaping
- Catch basin Cleaning
- Pavement Sweeping
- Gravel Wetland Maintenance
- Underground Chamber System

The following maintenance items and schedule represent the minimum action required. Monthly site inspections shall be conducted, and all measures must be maintained in effective operating condition. The following items shall be observed during site inspection and maintenance:

- Inspect vegetated areas, particularly slopes and embankments for areas of erosion. Replant and restore as necessary
- Inspect catch basins for sediment buildup
- Inspect site for trash and debris

3.3 Overall Site Operation & Maintenance Schedule

Overall Site Operation and Maintenance Schedule		
Maintenance Item	**Frequency of Maintenance**	**Operation**
Litter/Debris Removal	Weekly	Management Company
Pavement Sweeping - Sweep impervious areas to remove sand and litter.	Annually	Parking Lot Sweeper
Sediment Forebay - Trash and debris to be removed including at check dam. - Embankment to be mowed. - Any required maintenance shall be addressed. - Inspect sediment accumulation and clean as needed.	Periodically (At least two (2) times annually)	Management Company
Gravel wetland - Trash and debris to be removed including at outlet structure. - Embankment to be mowed. - Any required maintenance shall be addressed.	Periodically (At least two (2) times annually)	Management Company
Rip Rap Aprons - Trash and debris to be removed. - Any required maintenance shall be addressed.	Annually	Management Company
Catch Basin (CB) Cleaning - CB to be cleaned of solids and oils. - Remove any accumulated debris from the grates - Inspect hood to ensure that it is properly secured.	Quarterly Inspect sumps for accumulated sediment. If sediment has reached a depth of eighteen inches (18”), remove via clamshell bucket or vacuum truck.	Vacuum Truck
Landscaping - Landscaped islands to be maintained and mulched.	Maintained as required and mulched each Spring	Management Company

Sediment Forebay Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor Sediment Accumulation	Annually	- Install and maintain a staff gage or other measuring devise, to indicate depth of sediment accumulation and level at which clean-out is required
Visual inspection	Annually	- Remove trash and debris as needed - Remove any woody vegetation - Inspect and repair embankments - Inspect check dam
Mowing	Periodically (At least two (2) times annually)	- Embankments shall be mowed

Proprietary Separators Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
- All operation and maintenance to follow Proprietary Separator Manufacturer's guidelines. - Sediment to be removed once it reaches approximately 15% of unit storage capacity. - Units to be cleaned immediately after an oil, fuel, or chemical spill.		
Monitor Sediment Accumulation	Quarterly	- Inspect structure for accumulated sediment and oil. Remove sediment if sediment has reached maximum depth. If oil is present, pump off oil layer.
Visual inspection	Annually	- Inspect structure for accumulated sediment and oil. Remove sediment if sediment has reached maximum depth. If oil is present, pump off oil layer.

Gravel Wetland Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor to ensure that Gravel Wetland functions effectively after storms	Four (4) times annually (quarterly) and after any rainfall event exceeding 2.5" in a 24-hr period	- Trash and debris to be removed - Any required maintenance shall be addressed
Inspect Vegetation	Annually	- Inspect the condition of all gravel wetland vegetation - Prune back overgrowth - Replace dead vegetation - Remove any invasive species -Coordinate with UNH Stormwater Center for further vegetation management guidelines
Inspect Drawdown Time - The system shall drawdown within 48-hours following a rainfall event.	Annually	- Hire qualified professional to assess the condition of the facility to determine measures required to restore the filtration function, including but not limited to removal of accumulated sediments or reconstruction of the filter.

Additional Gravel Wetland Operation and Maintenance Requirements:

- ***1st Year Post-Construction:*** Inspection frequency shall be after every storm in the first year following construction.
- Inspect to be certain system drains within 24 - 48 hours (within the design period, but also not so quickly as to minimize stormwater treatment).
- Watering plants as necessary during the first growing season.
- Re-vegetating poorly established areas as necessary.
- Treating diseased vegetation as necessary.
- Inspect soil and repair eroded areas, especially on slopes, at a minimum quarterly.
- Check inlets, outlets, and overflow spillway for blockage, structural integrity and evidence of erosion.

Cleaning Criteria for Gravel Wetland Treatment Cells: Sediment shall be removed from the gravel wetland surface when it accumulates to a depth of several inches (>10 cm) across the wetland surface. Materials shall be removed with rakes rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment may be used if the equipment is located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments shall be dewatered (if necessary) and disposed of in accordance with all local, state and federal requirements. Removal of vegetation within the gravel wetland shall

occur every three (3) growing seasons, or the end of the summer of the third year. This is to prevent decay and release of nutrients from accumulated biomass.

Underground Chamber System Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
Monitor inlet and outlet structures for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed - Any required maintenance shall be addressed
Deep Sump Catchbasins	Two (2) times annually	- Removal of sediment as warranted by inspection - No less than once annually
Monitor detention system for sediment accumulation	Two (2) times annually	- Trash, debris and sediment to be removed via vacuum truck. - Any required maintenance shall be addressed

Rip Rap Inspection/Maintenance Requirements		
Inspection/ Maintenance	**Frequency**	**Action**
General Maintenance	Two (2) times annually	- During the fall and the spring remove any accumulated leaves or large debris.
Visual Inspection	Annually	- Visually inspect for damage and deterioration - Remove any branches, trash or other large debris that could interfere with the proper operation of the inlet or outlet of the basin. Remove any accumulated sediment, by the use of hand tools (shovels, rakes, wheelbarrows, etc.) when it exceeds three-inches (3") but not less than annually. - Repair damages immediately

3.3.1 Good Housekeeping Practices

Employees shall be instructed in the importance of not spilling fluids and chemicals such as oil, antifreeze, etc. onto the bare ground. All areas exposed to the weather shall be kept clean.

3.3.2 Provisions for Storing Materials and Waste Products Inside or Under Cover

Liquid waste products shall be captured when draining from vehicles and stored in sealed containers under cover until they are disposed of. Waste products shall be disposed of in a legal manner, at a state licensed recycling center or landfill.

3.3.3 Requirements for Storage and Use of Fertilizers, Herbicides, and Pesticides

Fertilizers shall not be used within 25 feet of the wetland resource areas. Excess fertilizers shall be swept up from all impervious surfaces and not allowed to run into the drainage system.

All fertilizer, herbicides, and pesticides shall be stored at least 100 feet away from the wetland line. If stored on site, these materials should be kept in a wrapped or sealed container and kept under cover out of the rain and snow.

3.3.4 Spill Prevention and Response Plan

Oil booms shall be kept on site in a readily accessible area in the event of an oil spill. If an oil spill occurs, the booms shall be placed and secured at the overflow spillway and in front of the entrance to the Stormceptors.

First responders	Phone Numbers
Rockland Fire Department	911 if emergency or (781) 878-2123
Rockland Police Department	911 if emergency or (781) 871-3890
Mass Department of Environmental Protection Emergency Response	1-888-304-1133

3.3.5 Disposal Requirements

Disposal of debris, trash, sediment and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state and federal waste regulations.

Solid waste shall be collected at a minimum of once per week and disposed of in an appropriate dumpster or garbage truck. Waste shall be disposed of in a legal manner, at a state licensed recycling center or landfill.

3.3.6 Snow & Ice Management for Standard Asphalt and Walkways

Snow storage areas shall be located such that no direct untreated discharges are possible to receiving waters from the storage site (snow storage areas have been shown on the Site Plan).

Salt shall not be used at this site.

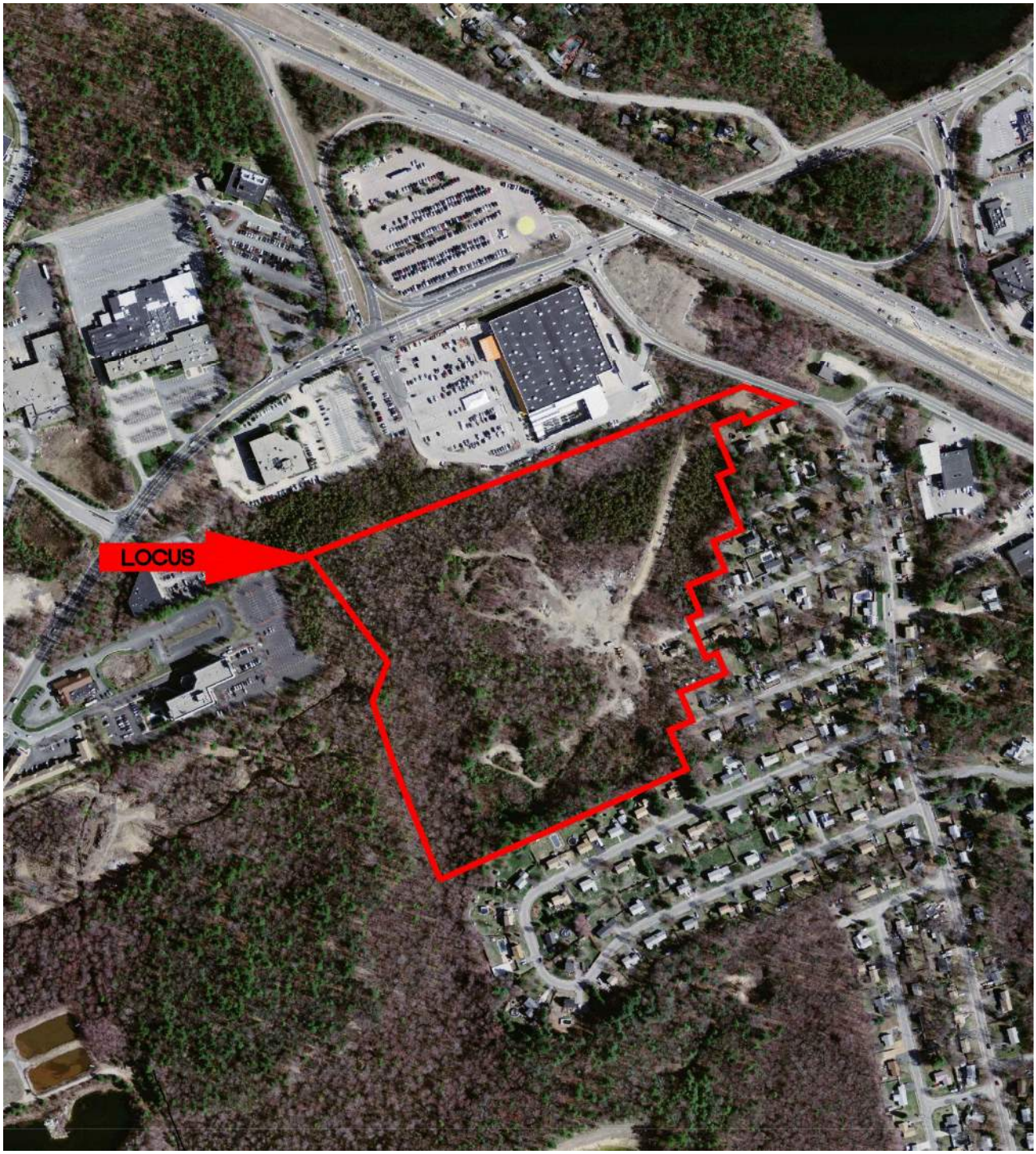
3.3.7 Annual Updates and Log Requirements

The Owner and/or Contact/Responsible Party shall review this Operation and Maintenance Plan once per year for its effectiveness and adjust the plan and deed as necessary.

A log of all preventative and corrective measures for the stormwater system shall be kept on-site and be made available upon request by any public entity with administrative, health environmental or safety authority over the site.

Stormwater Management Report						
Project Name		**Shingle Mill Apartments**				
BMP Description	**Date of Inspection**	**Inspector**	**BMP Installed and Operating Properly?**	**Cleaning / Corrective Action Needed**	**Date of Cleaning / Repair**	**Performed By**
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			
			❑Yes ❑No			

List of Figures



NOTE:
INFORMATION ON THIS PLAN WAS OBTAINED FROM MASSGIS DATABASE AERIAL PHOTOGRAPHIC IMAGES, APRIL 2008/2009.

N

0 250' 500'

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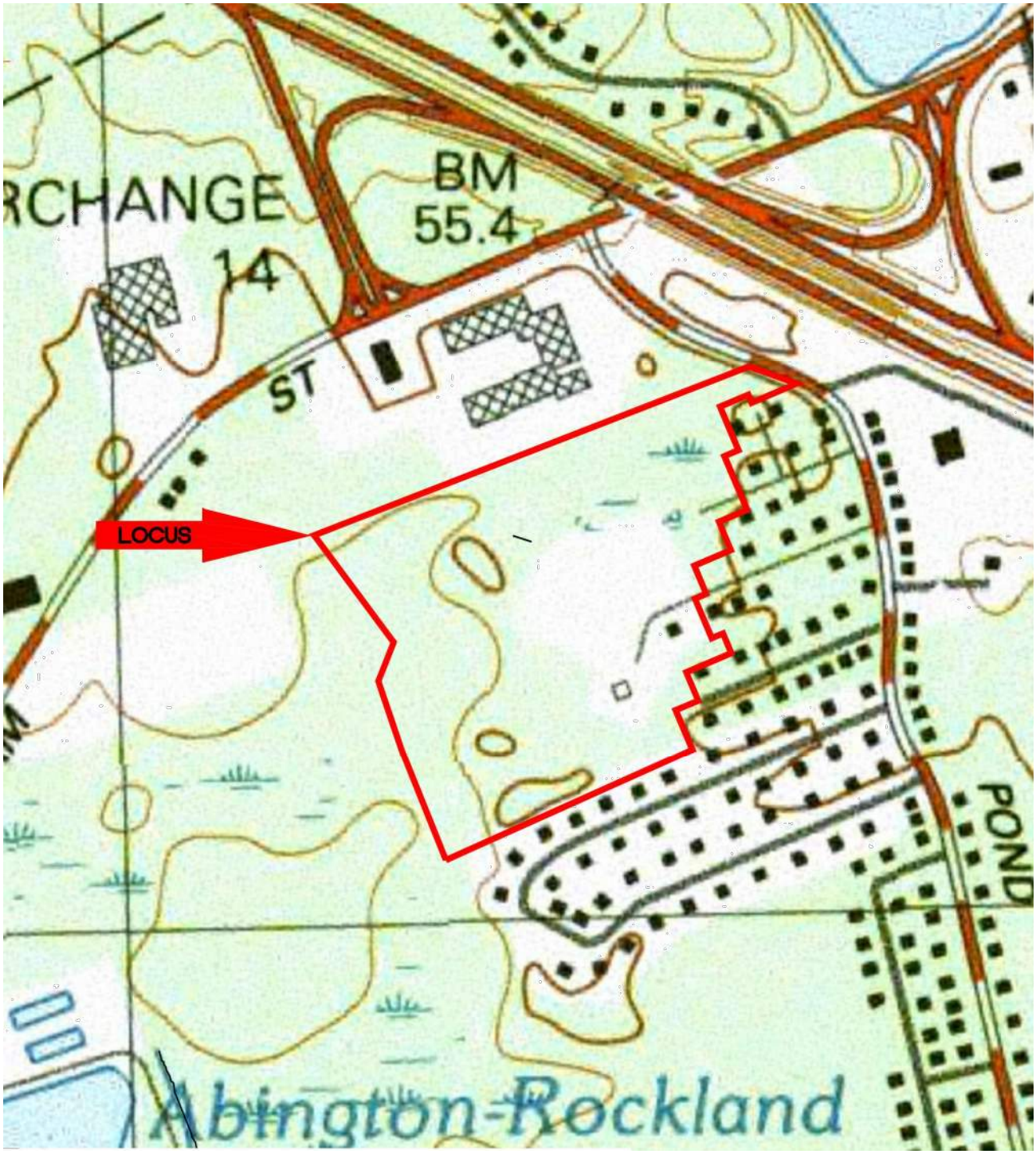
FIGURE 1
AERIAL MAP

Proposed Multi-Family Development
Jones Street
Rockland, Massachusetts

July 2020



NOTE:
INFORMATION ON THIS PLAN WAS OBTAINED
FROM MASSGIS DATABASE OF SCANNED 1:25,000
USGS TOPOGRAPHIC QUAD IMAGES, JUNE 2001.

N

0 250' 500'

Tighe&Bond

FIGURE 2
USGS TOPOGRAPHIC MAP

Proposed Multi-Family
Development
Jones Street
Rockland, Massachusetts

July 2020

FLOOD ZONE X, AREAS BETWEEN THE LIMITS OF 100–YEAR AND 500–YEAR FLOODS

FLOODWAY AREAS IN ZONE AE

FLOOD ZONE AE, AREAS OF 100–YEAR FLOOD, BASE FLOOD ELEVATIONS DETERMINED

FLOOD ZONE A, AREAS OF 100–YEAR FLOOD, BASE FLOOD ELEVATIONS NOT DETERMINED

NOTE:
FLOOD BOUNDARY INFORMATION ON THIS PLAN WAS FOUND ON FEMA FLOOD INSURANCE RATE MAP FOR PLYMOUTH COUNTY COMMUNITY MAP NO. 25023C0092J, EFFECTIVE JULY 17, 2012, ALONG WITH UPDATED PER LETTER OF MAP REVISION 13-01-2134P EFFECTIVE APRIL 14, 2014.

N

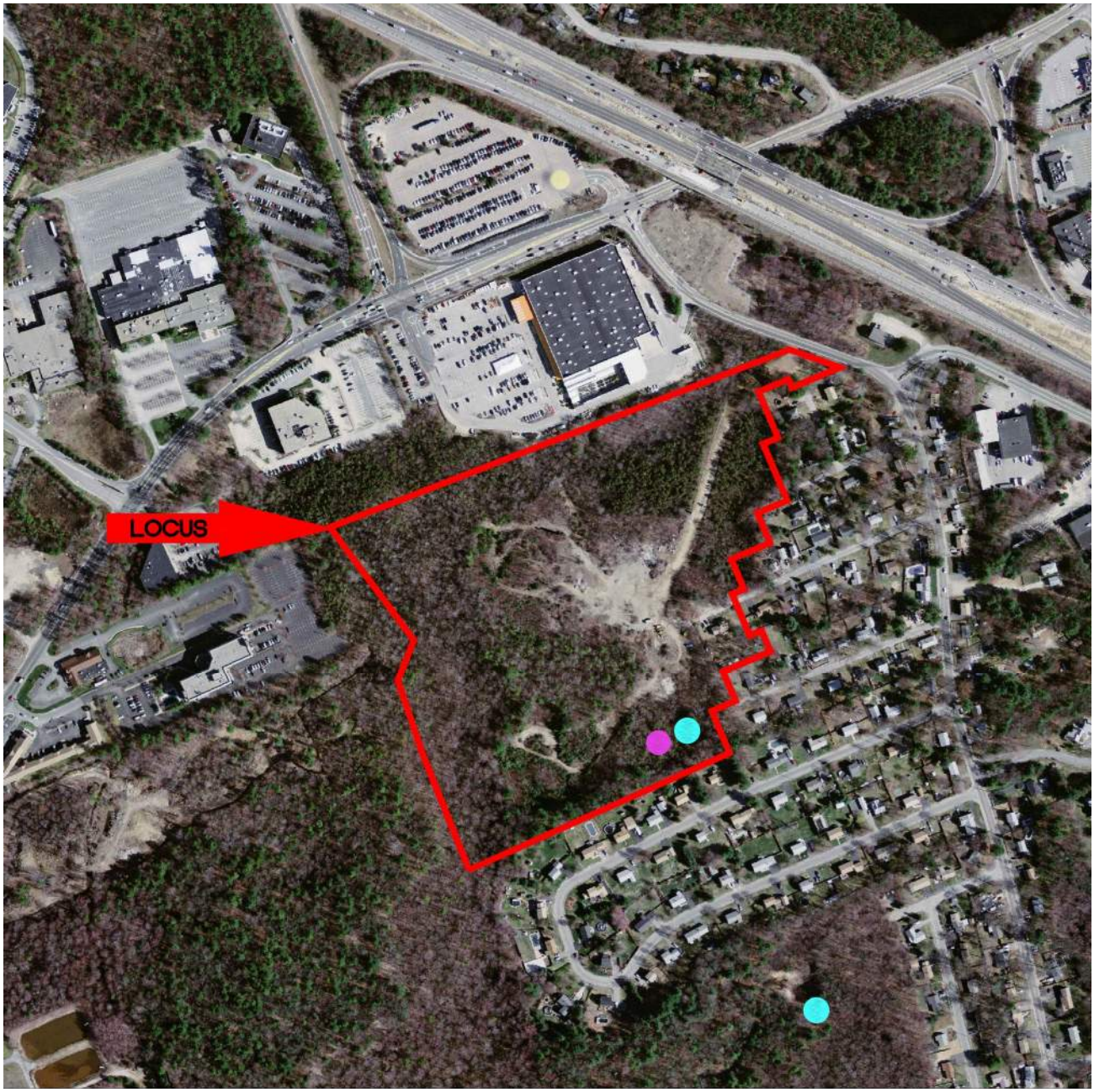
0 250' 500'

Tighe&Bond

FIGURE 3
FLOOD INSURANCE RATE MAP

Proposed Multi-Family Development
Jones Street
Rockland, Massachusetts

July 2020



NOTES:

1. ESTIMATED HABITATS OF RARE WILDLIFE AND PRIORITY HABITATS OF RARE SPECIES CAME FROM MASSGIS DATABASE LAST UPDATED AUGUST 2017.
2. CERTIFIED VERNAL POOL LOCATIONS WERE TAKEN FROM MASSGIS DATABASE ON OCTOBER 4, 2019. THIS DATA IS UPDATED CONTINUALLY AND SHOWN CONDITIONS MAY VARY FROM THIS DATA.
3. POTENTIAL VERNAL POOL LOCATIONS WERE TAKEN FROM MASSGIS DATABASE LAST UPDATED DECEMBER 2000.
4. THERE ARE NO ESTIMATED HABITATS OF RARE WILDLIFE OR PRIORITY HABITATS OF RARE SPECIES ON THE PROJECT SITE.

N

0 250' 500'

Tighe&Bond

FIGURE 4
NATURAL HERITAGE MAP

Proposed Multi-Family Development
Jones Street
Rockland, Massachusetts

July 2020

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

WELLHEAD PROTECTION AREAS

OUTSTANDING RESOURCE WATERS

SURFACE WATER SUPPLY PROTECTION

NOTES:
1. AREAS OF CRITICAL ENVIRONMENTAL CONCERN WERE TAKEN FROM MASSGIS DATABASE, LAST UPDATED APRIL 2009.
2. WELLHEAD PROTECTION AREAS WERE TAKEN FROM MASSGIS DATABASE, LAST UPDATED APRIL 2019.
3. OUTSTANDING RESOURCE WATERS WERE TAKEN FROM MASSGIS DATABASE, LAST UPDATED MARCH 2010.
4. SURFACE WATER SUPPLY PROTECTION AREAS WERE TAKEN FROM MASSGIS DATABASE, LAST UPDATED APRIL 2017.
5. THERE ARE NO AREAS OF CRITICAL ENVIRONMENTAL CONCERN OR WELLHEAD PROTECTION AREAS ON THIS PROJECT SITE.

N

0 250' 500'

Tighe&Bond

FIGURE 5
CRITICAL AREAS

Proposed Multi-Family Development
Jones Street
Rockland, Massachusetts

July 2020

NOTE:
INFORMATION ON THIS PLAN WAS OBTAINED FROM MASSGIS DATABASE, NRCS SSURGO - CERTIFIED SOILS WHICH WAS LAST UPDATED NOVEMBER 2012.

N

0 250' 500'

Tighe&Bond

FIGURE 6
SOIL SURVEY MAP

Proposed Multi-Family Development
Jones Street
Rockland, Massachusetts

July 2020

Appendices

Appendix A Test Pit Logs

Appendix B NRCS Web Soils Map

Appendix C Pipe Sizing Calculations

PROPOSED GRAVEL WETLAND

PROPOSED RETAINING WALL

PROPOSED 5 STORY 127 UNIT BUILDING

PROPOSED RETAINING WALL

PROPOSED RETAINING WALL

PROPOSED 5 STORY 109 UNIT BUILDING

PROPOSED UNDERGROUND INFILTRATION SYSTEM

PROPOSED COMMUNITY BUILDING

B-9 TB-1 MGA-1 SH-2 TP-10 TP-7 MGA-4 MGA-2 TB-11 MGA-7 TB-10 MGA-10 MGA-8 TP-6 TP-5 MGA-3 TP-2 TB-13 MGA-11 TB-6 MGA-5 TP-8 TP-9 TP-4 TB-4 TP-11 MGA-6 MGA-12/12A MGA-9 TP-12 SH-3 TB-8 TB-7 TP-3 TB-13 TP-15 TP-14 TP-17 TP-16 SH-1 SH-4 TB-13 TB-14 TB-12 TP-1

LEGEND

TB-1	APPROXIMATE LOCATION OF BORINGS PERFORMED BY TIGHE & BOND
TP-1	APPROXIMATE LOCATION OF TEST PITS PERFORMED BY TIGHE & BOND
SH-1	APPROXIMATE LOCATION OF BORINGS PERFORMED BY SANBORN HEAD
MGA-1	APPROXIMATE LOCATION OF BORINGS PERFORMED BY McARDLE GANNON ASSOCIATES
	APPROXIMATE EXTENT OF AREA OF LIQUEFACTION SUSCEPTIBLE SOIL (NATURALLY DEPOSITED SOIL WITH FACTOR OF SAFETY AGAINST LIQUEFACTION LESS THAN, OR EQUAL TO ONE)

NOTES:

1. PLAN OBTAINED AND PREPARED BY CONECO ENGINEERS & SCIENTISTS TITLED "SITE LAYOUT PLAN" DATED MAY 14, 2020.
2. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NAVD88.
3. CONTOUR LINES INDICATE EXISTING GROUND SURFACE.
4. BORINGS LOCATIONS BASED ON TAPING AND LINE OF SIGHT FROM EXISTING SITE FEATURES. LOCATIONS SHOULD BE CONSIDERED APPROXIMATE.
5. TIGHE & BOND BORINGS DRILLED BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NH, BETWEEN JUNE 3 AND JUNE 10, 2020. BORINGS WERE OBSERVED BY A TIGHE & BOND REPRESENTATIVE ON A FULL TIME BASIS. REFER TO BORING LOGS IN APPENDIX B FOR MORE DETAILED INFORMATION.
6. TIGHE & BOND TEST PITS EXCAVATED BY NEW ENGLAND BORING CONTRACTORS OF DERRY, NH, BETWEEN JUNE 3 AND JUNE 5, 2020. TEST PITS WERE OBSERVED BY A TIGHE & BOND REPRESENTATIVE ON A FULL TIME BASIS. REFER TO TEST PIT LOGS IN APPENDIX C FOR MORE DETAILED INFORMATION.
7. SOIL LIQUEFACTION SUSCEPTIBILITY EVALUATED BASED ON EXPLORATIONS BY TIGHE & BOND AS WELL AS PREVIOUS BORINGS.

SCALE IN FEET
0 100' 200'
GRAPHIC SCALE

PROPOSED MULTIFAMILY RESIDENTIAL DEVELOPMENT
ROCKLAND, MASSACHUSETTS

EXPLORATION LOCATION PLAN

FIGURE:	2
DATE:	8/31/2020
DRAWN BY:	CML
CHECKED BY:	MR
APPROVED BY:	MAA

Tighe&Bond
Engineers | Environmental Specialists

Last Save Date: September 1, 2020 12:19 AM By: CML
Plot Date: September 01, 2020 7:49 AM By: Craig M. Langton
File Location: J:\J\J5019 Jones Street\002 Pond St, Rockland\Drawings, Figures\AutoCAD\Sheet\J5019-002-C-Borings.dwg Layout Tab: Borings

Tighe&Bond

Project/Site Information

Geo-Environmental Investigation
Jones Street Residential
Rockland, Massachusetts

Test Pit No. **TP-8**
Page No. 1 of 1
File No. J-5019-002
Checked By:

T&B Rep.	M. Trovato	Contractor	New England Boring Contractors			Date	06/03/20
		Operator	Manly Thompson			Ground Elev.	138±
Weather	77 Degrees - Sunny	Make	Kubota	Model	KX-080-4	Time Started	15:40
		Capacity	0.3 yd^3	Reach	15.1 ft.	Time Completed	16:15

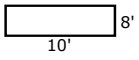
Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulder Count/ Class	Note No.
0				E	A (5%)	
1'				E	A (5%)	
2'	Light brown, fine to coarse SAND, little fine to coarse Gravel, little Silt, dry	S-1	0.0	E	A (5%)	
3'				E	A (5-10%)	
4'				E	A (5%)	1
5'	4.9'					
	Light brown, fine to coarse SAND and SILT, trace fine Gravel, wet	S-2	0.0	E	A (5%)	
6'				E	A (5%)	
7'				E	A (5%)	2
8'	8'					
	Bottom of exploration at 8 feet					
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1) Groundwater observed to infiltrate test pit at approximately 5 feet below surface grade.

2) Bottom of exploration at 8 feet below grade due to sidewall collapse.

Test Pit Plan



Volume = 22.1 cu. yd.

Boulder Class

Letter Designation	Size Range Classification
A	6" - 17"
B	18" - 36"
C	36" +

Excavation Effort
E-----Easy
M-----Moderate
D-----Difficult

Proportions Used

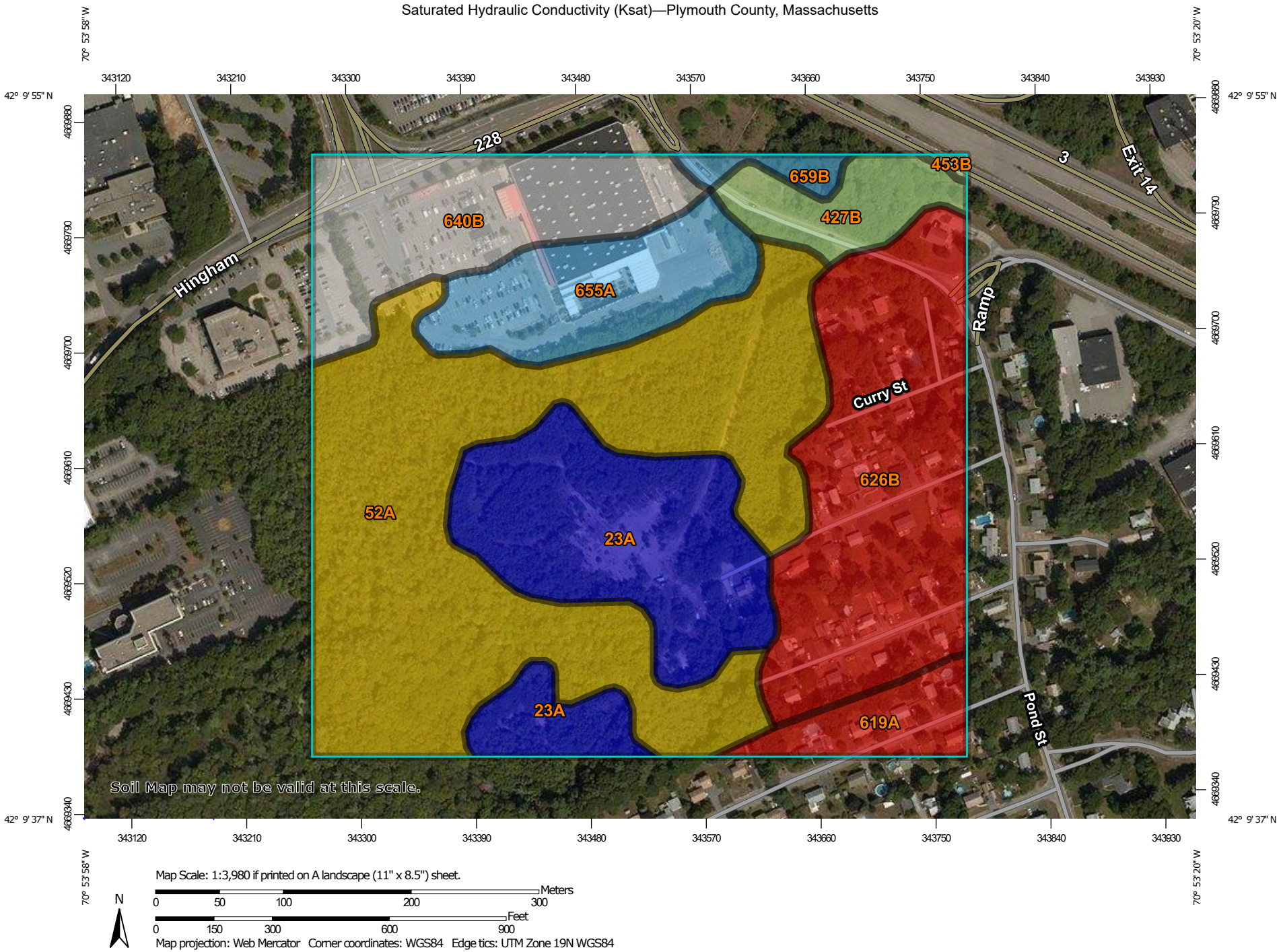
TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

Abbreviations
F = Fine
M = Medium
C = Coarse
V = Very
F/M = Fine to medium
F/C = Fine to coarse
GR = Gray
BN = Brown
YEL = Yellow

GROUNDWATER
(X) Encountered
( ) Not Encountered

Elapsed Time to Reading (Hours)	Depth to Ground-water
0.25	5'

J:\J\J5019 Jones Street\002 Pond St, Rockland\Environmental\Test Pits\Explorations\[Test Pit Log TP-7.xls]TP-8



Map Scale: 1:3,980 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

- <= 0.0050
- > 0.0050 and <= 1.4588
- > 1.4588 and <= 5.6865
- > 5.6865 and <= 10.0000
- > 10.0000 and <= 31.9144
- Not rated or not available

Soil Rating Lines

- <= 0.0050
- > 0.0050 and <= 1.4588
- > 1.4588 and <= 5.6865
- > 5.6865 and <= 10.0000
- > 10.0000 and <= 31.9144
- Not rated or not available

Soil Rating Points

- <= 0.0050
- > 0.0050 and <= 1.4588
- > 1.4588 and <= 5.6865
- > 5.6865 and <= 10.0000
- > 10.0000 and <= 31.9144
- 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 1:12,000.

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: Plymouth County, Massachusetts
Survey Area Data: Version 12, Sep 12, 2019

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

Date(s) aerial images were photographed: Aug 26, 2014—Sep 4, 2014

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.

Saturated Hydraulic Conductivity (Ksat)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
23A	Tihonet coarse sand, 0 to 3 percent slopes	31.9144	9.8	16.5%
52A	Freetown muck, 0 to 1 percent slopes	1.4588	21.4	35.8%
427B	Newfields fine sandy loam, 3 to 8 percent slopes, extremely stony	5.6865	2.5	4.1%
453B	Gloucester - Canton complex, 3 to 8 percent slopes, extremely bouldery	4.4243	0.1	0.2%
619A	Deerfield-Urban land complex, 0 to 3 percent slopes	0.0050	2.1	3.4%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	0.0050	11.6	19.4%
640B	Urban land, till substratum, 0 to 8 percent slopes		6.7	11.2%
655A	Udorthents, wet substratum, 0 to 3 percent slopes	10.0000	5.0	8.3%
659B	Udorthents, 0 to 8 percent slopes, gravelly	10.0000	0.7	1.1%
Totals for Area of Interest			**59.8**	**100.0%**

Description

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits.

Rating Options

Units of Measure: micrometers per second

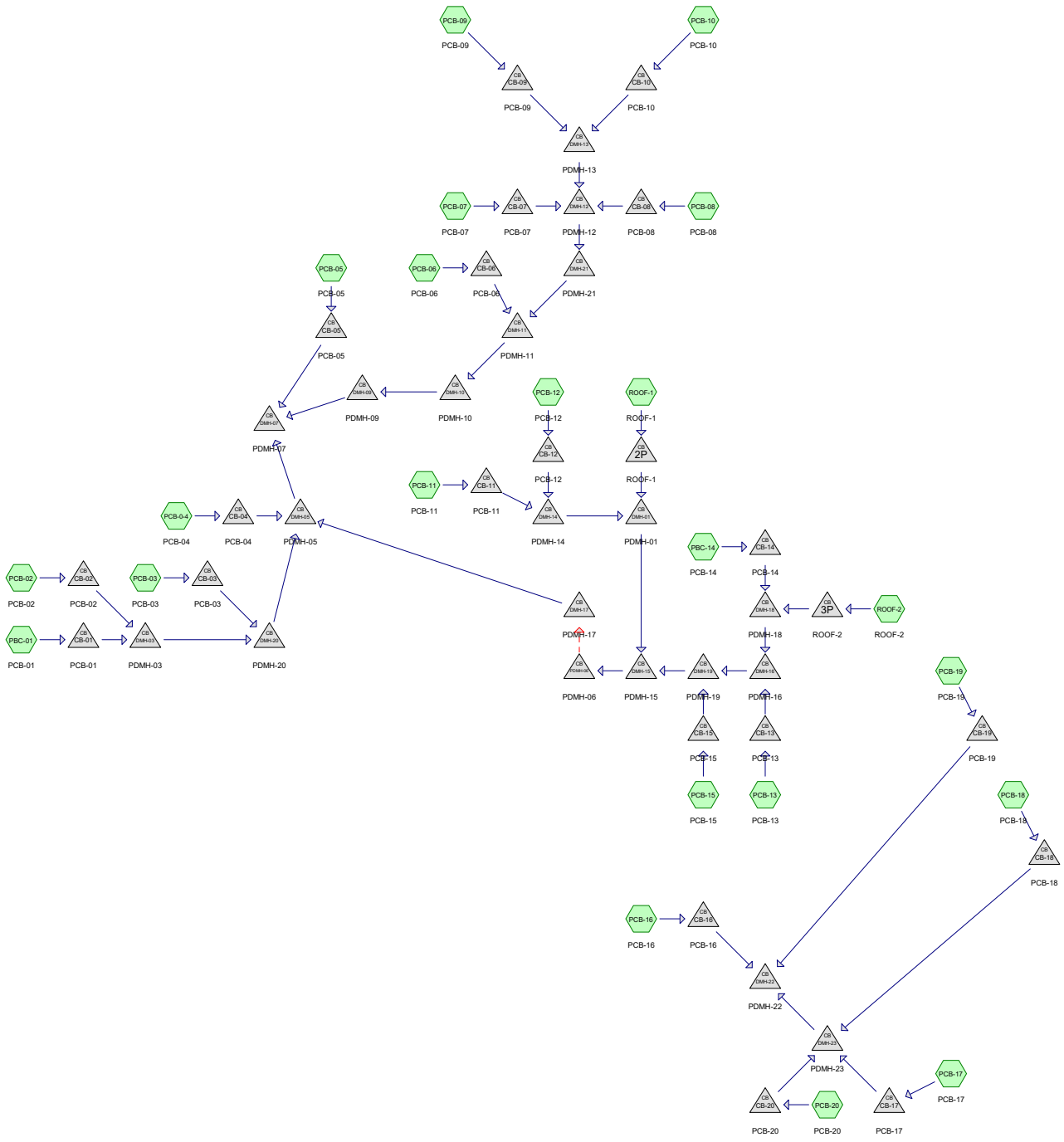
Aggregation Method: Minimum or Maximum

Component Percent Cutoff: None Specified

Tie-break Rule: Slowest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)


PCB-09
PCB-10
CB-09
CB-10
PDMH-13
PCB-07
CB-07
CB-08
PCB-08
PDMH-12
PCB-05
PCB-06
CB-06
PDMH-21
CB-05
PDMH-11
PDMH-09
PDMH-10
PCB-12
ROOF-1
2P
PDMH-07
PCB-11
PDMH-14
PDMH-01
PCB-04
CB-04
PDMH-05
PBC-14
CB-14
PDMH-17
PDMH-18
3P
ROOF-2
PCB-02
CB-02
PCB-03
CB-03
PBC-01
CB-01
PDMH-03
PDMH-20
PDMH-06
PDMH-15
PDMH-19
PDMH-16
CB-15
CB-13
PCB-19
CB-19
PCB-18
CB-18
PCB-16
CB-16
PDMH-22
PDMH-23
CB-20
PCB-20
CB-17
PCB-17
Subcat
Reach
Pond
Link
Routing Diagram for J5019-002_Pipe Sizing-Rev-1
Prepared by Tighe & Bond, Printed 12/4/2020
HydroCAD® 10.00-20 s/n 03436 © 2017 HydroCAD Software Solutions LLC

Time span=0.00-48.00 hrs, dt=0.10 hrs, 481 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PBC-01: PCB-01 Runoff Area=5,500 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.70 cfs 2,728 cf

Subcatchment PBC-14: PCB-14 Runoff Area=10,000 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.27 cfs 4,960 cf

Subcatchment PCB-0-4: PCB-04 Runoff Area=7,400 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.94 cfs 3,670 cf

Subcatchment PCB-02: PCB-02 Runoff Area=3,400 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.43 cfs 1,686 cf

Subcatchment PCB-03: PCB-03 Runoff Area=4,300 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.55 cfs 2,133 cf

Subcatchment PCB-05: PCB-05 Runoff Area=7,600 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.97 cfs 3,769 cf

Subcatchment PCB-06: PCB-06 Runoff Area=5,250 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.67 cfs 2,604 cf

Subcatchment PCB-07: PCB-07 Runoff Area=3,500 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.45 cfs 1,736 cf

Subcatchment PCB-08: PCB-08 Runoff Area=3,350 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.43 cfs 1,662 cf

Subcatchment PCB-09: PCB-09 Runoff Area=5,150 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.66 cfs 2,554 cf

Subcatchment PCB-10: PCB-10 Runoff Area=5,750 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.73 cfs 2,852 cf

Subcatchment PCB-11: PCB-11 Runoff Area=20,000 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=2.55 cfs 9,919 cf

Subcatchment PCB-12: PCB-12 Runoff Area=20,000 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=2.55 cfs 9,919 cf

Subcatchment PCB-13: PCB-13 Runoff Area=10,400 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.32 cfs 5,158 cf

Subcatchment PCB-15: PCB-15 Runoff Area=15,000 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.91 cfs 7,440 cf

Subcatchment PCB-16: PCB-16 Runoff Area=9,400 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.20 cfs 4,662 cf

Subcatchment PCB-17: PCB-17 Runoff Area=9,600 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.22 cfs 4,761 cf

Subcatchment PCB-18: PCB-18 Runoff Area=12,000 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.53 cfs 5,952 cf

Subcatchment PCB-19: PCB-19 Runoff Area=14,000 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=1.78 cfs 6,944 cf

Subcatchment PCB-20: PCB-20 Runoff Area=2,300 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.29 cfs 1,141 cf

Subcatchment ROOF-1: ROOF-1 Runoff Area=30,096 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=3.83 cfs 14,927 cf

Subcatchment ROOF-2: ROOF-2 Runoff Area=3,085 sf 100.00% Impervious Runoff Depth=5.95"
Tc=3.0 min CN=98 Runoff=0.39 cfs 1,530 cf

Pond 2P: ROOF-1 Peak Elev=141.04' Inflow=3.83 cfs 14,927 cf
12.0" Round Culvert n=0.013 L=33.0' S=0.0152 '/' Outflow=3.83 cfs 14,927 cf

Pond 3P: ROOF-2 Peak Elev=141.05' Inflow=0.39 cfs 1,530 cf
6.0" Round Culvert n=0.013 L=14.0' S=0.0107 '/' Outflow=0.39 cfs 1,530 cf

Pond CB-01: PCB-01 Peak Elev=139.57' Inflow=0.70 cfs 2,728 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0060 '/' Outflow=0.70 cfs 2,728 cf

Pond CB-02: PCB-02 Peak Elev=139.57' Inflow=0.43 cfs 1,686 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=0.43 cfs 1,686 cf

Pond CB-03: PCB-03 Peak Elev=139.54' Inflow=0.55 cfs 2,133 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=0.55 cfs 2,133 cf

Pond CB-04: PCB-04 Peak Elev=139.47' Inflow=0.94 cfs 3,670 cf
12.0" Round Culvert n=0.013 L=8.0' S=0.0062 '/' Outflow=0.94 cfs 3,670 cf

Pond CB-05: PCB-05 Peak Elev=138.09' Inflow=0.97 cfs 3,769 cf
12.0" Round Culvert n=0.013 L=63.0' S=0.0103 '/' Outflow=0.97 cfs 3,769 cf

Pond CB-06: PCB-06 Peak Elev=138.57' Inflow=0.67 cfs 2,604 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=0.67 cfs 2,604 cf

Pond CB-07: PCB-07 Peak Elev=139.62' Inflow=0.45 cfs 1,736 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=0.45 cfs 1,736 cf

Pond CB-08: PCB-08 Peak Elev=139.62' Inflow=0.43 cfs 1,662 cf
12.0" Round Culvert n=0.013 L=7.0' S=0.0071 '/' Outflow=0.43 cfs 1,662 cf

Pond CB-09: PCB-09 Peak Elev=140.61' Inflow=0.66 cfs 2,554 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=0.66 cfs 2,554 cf

Pond CB-10: PCB-10 Peak Elev=140.63' Inflow=0.73 cfs 2,852 cf
12.0" Round Culvert n=0.013 L=14.0' S=0.0071 '/' Outflow=0.73 cfs 2,852 cf

Pond CB-11: PCB-11 Peak Elev=141.01' Inflow=2.55 cfs 9,919 cf
12.0" Round Culvert n=0.013 L=104.0' S=0.0048 '/' Outflow=2.55 cfs 9,919 cf

Pond CB-12: PCB-12 Peak Elev=140.99' Inflow=2.55 cfs 9,919 cf
12.0" Round Culvert n=0.013 L=4.0' S=0.0125 '/' Outflow=2.55 cfs 9,919 cf

Pond CB-13: PCB-13 Peak Elev=141.04' Inflow=1.32 cfs 5,158 cf
12.0" Round Culvert n=0.013 L=38.0' S=0.0053 '/' Outflow=1.32 cfs 5,158 cf

Pond CB-14: PCB-14 Peak Elev=141.05' Inflow=1.27 cfs 4,960 cf
12.0" Round Culvert n=0.013 L=69.0' S=0.0051 '/' Outflow=1.27 cfs 4,960 cf

Pond CB-15: PCB-15 Peak Elev=140.94' Inflow=1.91 cfs 7,440 cf
12.0" Round Culvert n=0.013 L=35.0' S=0.0057 '/' Outflow=1.91 cfs 7,440 cf

Pond CB-16: PCB-16 Peak Elev=137.51' Inflow=1.20 cfs 4,662 cf
12.0" Round Culvert n=0.013 L=9.0' S=0.0056 '/' Outflow=1.20 cfs 4,662 cf

Pond CB-17: PCB-17 Peak Elev=137.92' Inflow=1.22 cfs 4,761 cf
12.0" Round Culvert n=0.013 L=20.0' S=0.0050 '/' Outflow=1.22 cfs 4,761 cf

Pond CB-18: PCB-18 Peak Elev=138.00' Inflow=1.53 cfs 5,952 cf
12.0" Round Culvert n=0.013 L=241.0' S=0.0046 '/' Outflow=1.53 cfs 5,952 cf

Pond CB-19: PCB-19 Peak Elev=138.01' Inflow=1.78 cfs 6,944 cf
12.0" Round Culvert n=0.013 L=276.0' S=0.0047 '/' Outflow=1.78 cfs 6,944 cf

Pond CB-20: PCB-20 Peak Elev=137.90' Inflow=0.29 cfs 1,141 cf
12.0" Round Culvert n=0.013 L=18.0' S=0.0056 '/' Outflow=0.29 cfs 1,141 cf

Pond DMH-01: PDMH-01 Peak Elev=140.91' Inflow=8.93 cfs 34,766 cf
24.0" Round Culvert n=0.013 L=33.0' S=0.0076 '/' Outflow=8.93 cfs 34,766 cf

Pond DMH-03: PDMH-03 Peak Elev=139.56' Inflow=1.13 cfs 4,414 cf
12.0" Round Culvert n=0.013 L=105.0' S=0.0048 '/' Outflow=1.13 cfs 4,414 cf

Pond DMH-05: PDMH-05 Peak Elev=139.45' Inflow=10.68 cfs 17,892 cf
18.0" Round Culvert n=0.013 L=109.0' S=0.0037 '/' Outflow=10.68 cfs 17,892 cf

Pond DMH-07: PDMH-07 Peak Elev=138.05' Inflow=14.58 cfs 33,068 cf
24.0" Round Culvert n=0.013 L=17.0' S=0.0029 '/' Outflow=14.58 cfs 33,068 cf

Pond DMH-09: PDMH-09 Peak Elev=138.11' Inflow=2.93 cfs 11,407 cf
18.0" Round Culvert n=0.013 L=60.0' S=0.0042 '/' Outflow=2.93 cfs 11,407 cf

Pond DMH-10: PDMH-10 Peak Elev=138.15' Inflow=2.93 cfs 11,407 cf
18.0" Round Culvert n=0.013 L=144.0' S=0.0042 '/' Outflow=2.93 cfs 11,407 cf

Pond DMH-11: PDMH-11 Peak Elev=138.54' Inflow=2.93 cfs 11,407 cf
18.0" Round Culvert n=0.013 L=167.0' S=0.0045 '/' Outflow=2.93 cfs 11,407 cf

Pond DMH-12: PDMH-12 Peak Elev=139.62' Inflow=2.26 cfs 8,803 cf
12.0" Round Culvert n=0.013 L=74.0' S=0.0054 '/' Outflow=2.26 cfs 8,803 cf

Pond DMH-13: PDMH-13 Peak Elev=140.57' Inflow=1.39 cfs 5,406 cf
12.0" Round Culvert n=0.013 L=242.0' S=0.0045 '/' Outflow=1.39 cfs 5,406 cf

Pond DMH-14: PDMH-14 Peak Elev=140.96' Inflow=5.09 cfs 19,839 cf
18.0" Round Culvert n=0.013 L=37.0' S=0.0068 '/' Outflow=5.09 cfs 19,839 cf

Pond DMH-15: PDMH-15 Peak Elev=140.86' Inflow=13.83 cfs 53,853 cf
24.0" Round Culvert n=0.013 L=16.0' S=0.0031 '/' Outflow=13.83 cfs 53,853 cf

Pond DMH-16: PDMH-16 Peak Elev=141.03' Inflow=2.99 cfs 11,648 cf
12.0" Round Culvert n=0.013 L=81.0' S=0.0049 '/' Outflow=2.99 cfs 11,648 cf

Pond DMH-17: PDMH-17 Peak Elev=140.31' Inflow=8.06 cfs 7,675 cf
18.0" Round Culvert n=0.013 L=251.0' S=0.0082 '/' Outflow=8.06 cfs 7,675 cf

Pond DMH-18: PDMH-18 Peak Elev=141.04' Inflow=1.67 cfs 6,490 cf
12.0" Round Culvert n=0.013 L=19.0' S=0.0053 '/' Outflow=1.67 cfs 6,490 cf

Pond DMH-19: PDMH-19 Peak Elev=140.91' Inflow=4.90 cfs 19,087 cf
18.0" Round Culvert n=0.013 L=79.0' S=0.0051 '/' Outflow=4.90 cfs 19,087 cf

Pond DMH-20: PDMH-20 Peak Elev=139.54' Inflow=1.68 cfs 6,547 cf
12.0" Round Culvert n=0.013 L=49.0' S=0.0051 '/' Outflow=1.68 cfs 6,547 cf

Pond DMH-21: PDMH-21 Peak Elev=139.09' Inflow=2.26 cfs 8,803 cf
12.0" Round Culvert n=0.013 L=69.0' S=0.0058 '/' Outflow=2.26 cfs 8,803 cf

Pond DMH-22: PDMH-22 Peak Elev=137.44' Inflow=6.02 cfs 23,459 cf
15.0" Round Culvert n=0.013 L=135.0' S=0.0048 '/' Outflow=6.02 cfs 23,459 cf

Pond DMH-23: PDMH-23 Peak Elev=137.90' Inflow=3.04 cfs 11,854 cf
12.0" Round Culvert n=0.013 L=25.0' S=0.0060 '/' Outflow=3.04 cfs 11,854 cf

Pond PDMH-06: PDMH-06 Peak Elev=140.51' Inflow=13.83 cfs 53,853 cf
Primary=5.99 cfs 46,178 cf Secondary=8.06 cfs 7,675 cf Outflow=13.83 cfs 53,853 cf

Total Runoff Area = 207,081 sf Runoff Volume = 102,706 cf Average Runoff Depth = 5.95"
0.00% Pervious = 0 sf 100.00% Impervious = 207,081 sf

Summary for Subcatchment PBC-01: PCB-01

Runoff = 0.70 cfs @ 12.04 hrs, Volume= 2,728 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
5,500	98	Paved roads w/curbs & sewers, HSG D
5,500	98	Weighted Average
5,500		100.00% Impervious Area

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

Summary for Subcatchment PBC-14: PCB-14

Runoff = 1.27 cfs @ 12.04 hrs, Volume= 4,960 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
10,000	98	Paved roads w/curbs & sewers, HSG D
10,000	98	Weighted Average
10,000		100.00% Impervious Area

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

Summary for Subcatchment PCB-0-4: PCB-04

Runoff = 0.94 cfs @ 12.04 hrs, Volume= 3,670 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
7,400	98	Paved roads w/curbs & sewers, HSG D
7,400	98	Weighted Average
7,400		100.00% Impervious Area

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

Summary for Subcatchment PCB-02: PCB-02

Runoff = 0.43 cfs @ 12.04 hrs, Volume= 1,686 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
3,400	98	Paved roads w/curbs & sewers, HSG D
3,400	98	Weighted Average
3,400		100.00% Impervious Area

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

Summary for Subcatchment PCB-03: PCB-03

Runoff = 0.55 cfs @ 12.04 hrs, Volume= 2,133 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
4,300	98	Paved roads w/curbs & sewers, HSG D
4,300	98	Weighted Average
4,300		100.00% Impervious Area

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

Summary for Subcatchment PCB-05: PCB-05

Runoff = 0.97 cfs @ 12.04 hrs, Volume= 3,769 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
7,600	98	Paved roads w/curbs & sewers, HSG D
7,600	98	Weighted Average
7,600		100.00% Impervious Area

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

Summary for Subcatchment PCB-06: PCB-06

Runoff = 0.67 cfs @ 12.04 hrs, Volume= 2,604 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
5,250	98	Paved roads w/curbs & sewers, HSG D
5,250	98	Weighted Average
5,250		100.00% Impervious Area

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

Summary for Subcatchment PCB-07: PCB-07

Runoff = 0.45 cfs @ 12.04 hrs, Volume= 1,736 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
3,500	98	Paved roads w/curbs & sewers, HSG D
3,500	98	Weighted Average
3,500		100.00% Impervious Area

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

Summary for Subcatchment PCB-08: PCB-08

Runoff = 0.43 cfs @ 12.04 hrs, Volume= 1,662 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
3,350	98	Paved roads w/curbs & sewers, HSG D
3,350	98	Weighted Average
3,350		100.00% Impervious Area

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

Summary for Subcatchment PCB-09: PCB-09

Runoff = 0.66 cfs @ 12.04 hrs, Volume= 2,554 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
5,150	98	Paved roads w/curbs & sewers, HSG D
5,150	98	Weighted Average
5,150		100.00% Impervious Area

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

Summary for Subcatchment PCB-10: PCB-10

Runoff = 0.73 cfs @ 12.04 hrs, Volume= 2,852 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
5,750	98	Paved roads w/curbs & sewers, HSG D
5,750	98	Weighted Average
5,750		100.00% Impervious Area

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

Summary for Subcatchment PCB-11: PCB-11

Runoff = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
20,000	98	Paved roads w/curbs & sewers, HSG D
20,000	98	Weighted Average
20,000		100.00% Impervious Area

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

Summary for Subcatchment PCB-12: PCB-12

Runoff = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
20,000	98	Paved roads w/curbs & sewers, HSG D
20,000	98	Weighted Average
20,000		100.00% Impervious Area

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

Summary for Subcatchment PCB-13: PCB-13

Runoff = 1.32 cfs @ 12.04 hrs, Volume= 5,158 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
10,400	98	Paved roads w/curbs & sewers, HSG D
10,400	98	Weighted Average
10,400		100.00% Impervious Area

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

Summary for Subcatchment PCB-15: PCB-15

Runoff = 1.91 cfs @ 12.04 hrs, Volume= 7,440 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
15,000	98	Paved roads w/curbs & sewers, HSG D
15,000	98	Weighted Average
15,000		100.00% Impervious Area

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

Summary for Subcatchment PCB-16: PCB-16

Runoff = 1.20 cfs @ 12.04 hrs, Volume= 4,662 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
9,400	98	Paved roads w/curbs & sewers, HSG D
9,400	98	Weighted Average
9,400		100.00% Impervious Area

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

Summary for Subcatchment PCB-17: PCB-17

Runoff = 1.22 cfs @ 12.04 hrs, Volume= 4,761 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
9,600	98	Paved roads w/curbs & sewers, HSG D
9,600	98	Weighted Average
9,600		100.00% Impervious Area

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

Summary for Subcatchment PCB-18: PCB-18

Runoff = 1.53 cfs @ 12.04 hrs, Volume= 5,952 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
12,000	98	Paved roads w/curbs & sewers, HSG D
12,000	98	Weighted Average
12,000		100.00% Impervious Area

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

Summary for Subcatchment PCB-19: PCB-19

Runoff = 1.78 cfs @ 12.04 hrs, Volume= 6,944 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
14,000	98	Paved roads w/curbs & sewers, HSG D
14,000	98	Weighted Average
14,000		100.00% Impervious Area

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

Summary for Subcatchment PCB-20: PCB-20

Runoff = 0.29 cfs @ 12.04 hrs, Volume= 1,141 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
2,300	98	Paved roads w/curbs & sewers, HSG D
2,300	98	Weighted Average
2,300		100.00% Impervious Area

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

Summary for Subcatchment ROOF-1: ROOF-1

Runoff = 3.83 cfs @ 12.04 hrs, Volume= 14,927 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
30,096	98	Paved roads w/curbs & sewers, HSG D
30,096	98	Weighted Average
30,096		100.00% Impervious Area

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

Summary for Subcatchment ROOF-2: ROOF-2

Runoff = 0.39 cfs @ 12.04 hrs, Volume= 1,530 cf, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Type III 24-hr 25-year Rainfall=6.19"

Area (sf)	CN	Description
0	80	>75% Grass cover, Good, HSG D
3,085	98	Paved roads w/curbs & sewers, HSG D
3,085	98	Weighted Average
3,085		100.00% Impervious Area

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

Summary for Pond 2P: ROOF-1

Inflow Area = 30,096 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 3.83 cfs @ 12.04 hrs, Volume= 14,927 cf
Outflow = 3.83 cfs @ 12.04 hrs, Volume= 14,927 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.83 cfs @ 12.04 hrs, Volume= 14,927 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.04' @ 12.32 hrs
Flood Elev= 144.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.50'	**12.0" Round Culvert** L= 33.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.50' / 138.00' S= 0.0152 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.36 cfs @ 12.04 hrs HW=140.40' TW=140.01' (Dynamic Tailwater)
1=Culvert (Inlet Controls 2.36 cfs @ 3.01 fps)

Summary for Pond 3P: ROOF-2

Inflow Area = 3,085 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.39 cfs @ 12.04 hrs, Volume= 1,530 cf
Outflow = 0.39 cfs @ 12.04 hrs, Volume= 1,530 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.04 hrs, Volume= 1,530 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.05' @ 12.51 hrs
Flood Elev= 143.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.00'	**6.0" Round Culvert** L= 14.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 139.00' / 138.85' S= 0.0107 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.20 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.66' TW=139.92' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-01: PCB-01

Inflow Area = 5,500 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.70 cfs @ 12.04 hrs, Volume= 2,728 cf
Outflow = 0.70 cfs @ 12.04 hrs, Volume= 2,728 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.04 hrs, Volume= 2,728 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.57' @ 12.35 hrs
Flood Elev= 142.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.40'	**12.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.40' / 137.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.04 hrs HW=137.92' TW=137.87' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.33 cfs @ 1.16 fps)

Summary for Pond CB-02: PCB-02

Inflow Area = 3,400 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.43 cfs @ 12.04 hrs, Volume= 1,686 cf
Outflow = 0.43 cfs @ 12.04 hrs, Volume= 1,686 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.04 hrs, Volume= 1,686 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.57' @ 12.35 hrs
Flood Elev= 142.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.30'	**12.0" Round Culvert** L= 7.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.30' / 137.25' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=137.78' TW=137.87' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-03: PCB-03

Inflow Area = 4,300 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.55 cfs @ 12.04 hrs, Volume= 2,133 cf
Outflow = 0.55 cfs @ 12.04 hrs, Volume= 2,133 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.55 cfs @ 12.04 hrs, Volume= 2,133 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.54' @ 12.25 hrs
Flood Elev= 142.85'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.70'	**12.0" Round Culvert** L= 4.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.70' / 136.65' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=137.45' TW=138.26' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-04: PCB-04

Inflow Area = 7,400 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.94 cfs @ 12.04 hrs, Volume= 3,670 cf
Outflow = 0.94 cfs @ 12.04 hrs, Volume= 3,670 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.94 cfs @ 12.04 hrs, Volume= 3,670 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.47' @ 12.16 hrs
Flood Elev= 141.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.35'	**12.0" Round Culvert** L= 8.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.35' / 136.30' S= 0.0062 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=138.10' TW=139.21' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-05: PCB-05

Inflow Area = 7,600 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.97 cfs @ 12.04 hrs, Volume= 3,769 cf
Outflow = 0.97 cfs @ 12.04 hrs, Volume= 3,769 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.97 cfs @ 12.04 hrs, Volume= 3,769 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.09' @ 12.13 hrs
Flood Elev= 141.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.45'	**12.0" Round Culvert** L= 63.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.45' / 135.80' S= 0.0103 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=137.53' TW=137.90' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-06: PCB-06

Inflow Area = 5,250 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.67 cfs @ 12.04 hrs, Volume= 2,604 cf
Outflow = 0.67 cfs @ 12.04 hrs, Volume= 2,604 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.04 hrs, Volume= 2,604 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.57' @ 12.14 hrs
Flood Elev= 142.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.80'	**12.0" Round Culvert** L= 14.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.80' / 137.70' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=138.43' TW=138.51' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-07: PCB-07

Inflow Area = 3,500 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.45 cfs @ 12.04 hrs, Volume= 1,736 cf
Outflow = 0.45 cfs @ 12.04 hrs, Volume= 1,736 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.45 cfs @ 12.04 hrs, Volume= 1,736 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.62' @ 12.15 hrs
Flood Elev= 142.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.75'	**12.0" Round Culvert** L= 7.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.75' / 138.70' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.40' TW=139.58' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-08: PCB-08

Inflow Area = 3,350 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.43 cfs @ 12.04 hrs, Volume= 1,662 cf
Outflow = 0.43 cfs @ 12.04 hrs, Volume= 1,662 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.43 cfs @ 12.04 hrs, Volume= 1,662 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.62' @ 12.15 hrs
Flood Elev= 142.40'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.75'	**12.0" Round Culvert** L= 7.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.75' / 138.70' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.40' TW=139.58' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-09: PCB-09

Inflow Area = 5,150 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.66 cfs @ 12.04 hrs, Volume= 2,554 cf
Outflow = 0.66 cfs @ 12.04 hrs, Volume= 2,554 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.66 cfs @ 12.04 hrs, Volume= 2,554 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.61' @ 12.13 hrs
Flood Elev= 143.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**12.0" Round Culvert** L= 14.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.90' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.08 cfs @ 12.04 hrs HW=140.53' TW=140.53' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.08 cfs @ 0.27 fps)

Summary for Pond CB-10: PCB-10

Inflow Area = 5,750 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.73 cfs @ 12.04 hrs, Volume= 2,852 cf
Outflow = 0.73 cfs @ 12.04 hrs, Volume= 2,852 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.04 hrs, Volume= 2,852 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.63' @ 12.13 hrs
Flood Elev= 143.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	140.00'	**12.0" Round Culvert** L= 14.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 140.00' / 139.90' S= 0.0071 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.25 cfs @ 12.04 hrs HW=140.55' TW=140.53' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.25 cfs @ 0.80 fps)

Summary for Pond CB-11: PCB-11

Inflow Area = 20,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf
Outflow = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.01' @ 12.42 hrs
Flood Elev= 142.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.85'	**12.0" Round Culvert** L= 104.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.85' / 138.35' S= 0.0048 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.64 cfs @ 12.04 hrs HW=140.14' TW=139.84' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.64 cfs @ 2.10 fps)

Summary for Pond CB-12: PCB-12

Inflow Area = 20,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf
Outflow = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.55 cfs @ 12.04 hrs, Volume= 9,919 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.99' @ 12.42 hrs
Flood Elev= 142.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.40'	**12.0" Round Culvert** L= 4.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.40' / 138.35' S= 0.0125 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.04 hrs HW=139.86' TW=139.84' (Dynamic Tailwater)
1=Culvert (Inlet Controls 0.47 cfs @ 0.60 fps)

Summary for Pond CB-13: PCB-13

Inflow Area = 10,400 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.32 cfs @ 12.04 hrs, Volume= 5,158 cf
Outflow = 1.32 cfs @ 12.04 hrs, Volume= 5,158 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.32 cfs @ 12.04 hrs, Volume= 5,158 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.04' @ 12.42 hrs
Flood Elev= 142.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.85'	**12.0" Round Culvert** L= 38.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.85' / 138.65' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.90' TW=140.27' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-14: PCB-14

Inflow Area = 10,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.27 cfs @ 12.04 hrs, Volume= 4,960 cf
Outflow = 1.27 cfs @ 12.04 hrs, Volume= 4,960 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.27 cfs @ 12.04 hrs, Volume= 4,960 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.05' @ 12.51 hrs
Flood Elev= 142.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.20'	**12.0" Round Culvert** L= 69.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 139.20' / 138.85' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.18 cfs @ 12.04 hrs HW=139.93' TW=139.92' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.18 cfs @ 0.42 fps)

Summary for Pond CB-15: PCB-15

Inflow Area = 15,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.91 cfs @ 12.04 hrs, Volume= 7,440 cf
Outflow = 1.91 cfs @ 12.04 hrs, Volume= 7,440 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.91 cfs @ 12.04 hrs, Volume= 7,440 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.94' @ 12.32 hrs
Flood Elev= 142.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.35'	**12.0" Round Culvert** L= 35.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.35' / 138.15' S= 0.0057 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.70' TW=139.99' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-16: PCB-16

Inflow Area = 9,400 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.20 cfs @ 12.04 hrs, Volume= 4,662 cf
Outflow = 1.20 cfs @ 12.04 hrs, Volume= 4,662 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.04 hrs, Volume= 4,662 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 137.51' @ 12.13 hrs
Flood Elev= 138.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.30'	**12.0" Round Culvert** L= 9.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.30' / 135.25' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=136.72' TW=137.28' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-17: PCB-17

Inflow Area = 9,600 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.22 cfs @ 12.04 hrs, Volume= 4,761 cf
Outflow = 1.22 cfs @ 12.04 hrs, Volume= 4,761 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.22 cfs @ 12.04 hrs, Volume= 4,761 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 137.92' @ 12.21 hrs
Flood Elev= 138.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**12.0" Round Culvert** L= 20.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.60' / 135.50' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=136.60' TW=137.20' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond CB-18: PCB-18

Inflow Area = 12,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.53 cfs @ 12.04 hrs, Volume= 5,952 cf
Outflow = 1.53 cfs @ 12.04 hrs, Volume= 5,952 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.53 cfs @ 12.04 hrs, Volume= 5,952 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.00' @ 12.20 hrs
Flood Elev= 139.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.60'	**12.0" Round Culvert** L= 241.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.60' / 135.50' S= 0.0046 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.72 cfs @ 12.04 hrs HW=137.43' TW=137.20' (Dynamic Tailwater)
1=Culvert (Outlet Controls 0.72 cfs @ 1.39 fps)

Summary for Pond CB-19: PCB-19

Inflow Area = 14,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.78 cfs @ 12.04 hrs, Volume= 6,944 cf
Outflow = 1.78 cfs @ 12.04 hrs, Volume= 6,944 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.78 cfs @ 12.04 hrs, Volume= 6,944 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.01' @ 12.10 hrs
Flood Elev= 139.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.55'	**12.0" Round Culvert** L= 276.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.55' / 135.25' S= 0.0047 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.21 cfs @ 12.04 hrs HW=137.66' TW=137.28' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.21 cfs @ 1.73 fps)

Summary for Pond CB-20: PCB-20

Inflow Area = 2,300 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 0.29 cfs @ 12.04 hrs, Volume= 1,141 cf
Outflow = 0.29 cfs @ 12.04 hrs, Volume= 1,141 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.29 cfs @ 12.04 hrs, Volume= 1,141 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 137.90' @ 12.22 hrs
Flood Elev= 138.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.60'	**12.0" Round Culvert** L= 18.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.60' / 135.50' S= 0.0056 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=136.48' TW=137.20' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-01: PDMH-01

Inflow Area = 70,096 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 8.93 cfs @ 12.04 hrs, Volume= 34,766 cf
Outflow = 8.93 cfs @ 12.04 hrs, Volume= 34,766 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.93 cfs @ 12.04 hrs, Volume= 34,766 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.91' @ 12.23 hrs
Flood Elev= 142.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.90'	**24.0" Round Culvert** L= 33.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.90' / 137.65' S= 0.0076 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=140.01' TW=140.39' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-03: PDMH-03

Inflow Area = 8,900 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.13 cfs @ 12.04 hrs, Volume= 4,414 cf
Outflow = 1.13 cfs @ 12.04 hrs, Volume= 4,414 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.13 cfs @ 12.04 hrs, Volume= 4,414 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.56' @ 12.25 hrs
Flood Elev= 142.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.15'	**12.0" Round Culvert** L= 105.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.15' / 136.65' S= 0.0048 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=137.87' TW=138.26' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-05: PDMH-05

Inflow Area = 20,600 sf,100.00% Impervious, Inflow Depth = 10.42" for 25-year event
Inflow = 10.68 cfs @ 12.03 hrs, Volume= 17,892 cf
Outflow = 10.68 cfs @ 12.03 hrs, Volume= 17,892 cf, Atten= 0%, Lag= 0.0 min
Primary = 10.68 cfs @ 12.03 hrs, Volume= 17,892 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.45' @ 12.06 hrs
Flood Elev= 142.05'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.20'	**18.0" Round Culvert** L= 109.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.20' / 135.80' S= 0.0037 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=8.58 cfs @ 12.03 hrs HW=139.20' TW=137.92' (Dynamic Tailwater)
1=Culvert (Outlet Controls 8.58 cfs @ 4.86 fps)

Summary for Pond DMH-07: PDMH-07

Inflow Area = 51,200 sf,100.00% Impervious, Inflow Depth = 7.75" for 25-year event
Inflow = 14.58 cfs @ 12.03 hrs, Volume= 33,068 cf
Outflow = 14.58 cfs @ 12.03 hrs, Volume= 33,068 cf, Atten= 0%, Lag= 0.0 min
Primary = 14.58 cfs @ 12.03 hrs, Volume= 33,068 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.05' @ 12.03 hrs
Flood Elev= 141.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.70'	**24.0" Round Culvert** L= 17.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.70' / 135.65' S= 0.0029 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=13.48 cfs @ 12.03 hrs HW=137.91' (Free Discharge)
1=Culvert (Barrel Controls 13.48 cfs @ 4.83 fps)

Summary for Pond DMH-09: PDMH-09

Inflow Area = 23,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf
Outflow = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.11' @ 12.13 hrs
Flood Elev= 142.25'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.05'	**18.0" Round Culvert** L= 60.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.05' / 135.80' S= 0.0042 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=137.56' TW=137.90' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-10: PDMH-10

Inflow Area = 23,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf
Outflow = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.15' @ 12.21 hrs
Flood Elev= 142.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.75'	**18.0" Round Culvert** L= 144.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.75' / 136.15' S= 0.0042 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=1.36 cfs @ 12.04 hrs HW=137.73' TW=137.56' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.36 cfs @ 1.59 fps)

Summary for Pond DMH-11: PDMH-11

Inflow Area = 23,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf
Outflow = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.93 cfs @ 12.04 hrs, Volume= 11,407 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 138.54' @ 12.06 hrs
Flood Elev= 142.45'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.60'	**18.0" Round Culvert** L= 167.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.60' / 136.85' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=2.54 cfs @ 12.04 hrs HW=138.51' TW=137.73' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.54 cfs @ 3.24 fps)

Summary for Pond DMH-12: PDMH-12

Inflow Area = 17,750 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.26 cfs @ 12.04 hrs, Volume= 8,803 cf
Outflow = 2.26 cfs @ 12.04 hrs, Volume= 8,803 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.26 cfs @ 12.04 hrs, Volume= 8,803 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.62' @ 12.06 hrs
Flood Elev= 142.65'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.60'	**12.0" Round Culvert** L= 74.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.60' / 138.20' S= 0.0054 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.97 cfs @ 12.04 hrs HW=139.58' TW=139.06' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.97 cfs @ 3.18 fps)

Summary for Pond DMH-13: PDMH-13

Inflow Area = 10,900 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.39 cfs @ 12.04 hrs, Volume= 5,406 cf
Outflow = 1.39 cfs @ 12.04 hrs, Volume= 5,406 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.39 cfs @ 12.04 hrs, Volume= 5,406 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.57' @ 12.06 hrs
Flood Elev= 143.30'

Device	Routing	Invert	Outlet Devices
#1	Primary	139.80'	**12.0" Round Culvert** L= 242.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 139.80' / 138.70' S= 0.0045 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.18 cfs @ 12.04 hrs HW=140.53' TW=139.58' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.18 cfs @ 2.67 fps)

Summary for Pond DMH-14: PDMH-14

Inflow Area = 40,000 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 5.09 cfs @ 12.04 hrs, Volume= 19,839 cf
Outflow = 5.09 cfs @ 12.04 hrs, Volume= 19,839 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.09 cfs @ 12.04 hrs, Volume= 19,839 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.96' @ 12.32 hrs
Flood Elev= 142.35'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.25'	**18.0" Round Culvert** L= 37.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.25' / 138.00' S= 0.0068 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.84' TW=140.01' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-15: PDMH-15

Inflow Area = 108,581 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 13.83 cfs @ 12.04 hrs, Volume= 53,853 cf
Outflow = 13.83 cfs @ 12.04 hrs, Volume= 53,853 cf, Atten= 0%, Lag= 0.0 min
Primary = 13.83 cfs @ 12.04 hrs, Volume= 53,853 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.86' @ 12.14 hrs
Flood Elev= 143.10'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.55'	**24.0" Round Culvert** L= 16.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.55' / 137.50' S= 0.0031 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=5.02 cfs @ 12.04 hrs HW=140.39' TW=140.28' (Dynamic Tailwater)
1=Culvert (Inlet Controls 5.02 cfs @ 1.60 fps)

Summary for Pond DMH-16: PDMH-16

Inflow Area = 23,485 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.99 cfs @ 12.04 hrs, Volume= 11,648 cf
Outflow = 2.99 cfs @ 12.04 hrs, Volume= 11,648 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.99 cfs @ 12.04 hrs, Volume= 11,648 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.03' @ 12.32 hrs
Flood Elev= 142.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.55'	**12.0" Round Culvert** L= 81.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.55' / 138.15' S= 0.0049 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.67 cfs @ 12.04 hrs HW=140.27' TW=139.99' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.67 cfs @ 2.12 fps)

Summary for Pond DMH-17: PDMH-17

Inflow = 8.06 cfs @ 12.03 hrs, Volume= 7,675 cf
Outflow = 8.06 cfs @ 12.03 hrs, Volume= 7,675 cf, Atten= 0%, Lag= 0.0 min
Primary = 8.06 cfs @ 12.03 hrs, Volume= 7,675 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.31' @ 12.08 hrs
Flood Elev= 142.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.35'	**18.0" Round Culvert** L= 251.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.35' / 136.30' S= 0.0082 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.22 cfs @ 12.03 hrs HW=140.04' TW=139.19' (Dynamic Tailwater)
1=Culvert (Outlet Controls 5.22 cfs @ 3.28 fps)

Summary for Pond DMH-18: PDMH-18

Inflow Area = 13,085 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.67 cfs @ 12.04 hrs, Volume= 6,490 cf
Outflow = 1.67 cfs @ 12.04 hrs, Volume= 6,490 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.67 cfs @ 12.04 hrs, Volume= 6,490 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 141.04' @ 12.42 hrs
Flood Elev= 143.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.75'	**12.0" Round Culvert** L= 19.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.75' / 138.65' S= 0.0053 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.92' TW=140.27' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-19: PDMH-19

Inflow Area = 38,485 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 4.90 cfs @ 12.04 hrs, Volume= 19,087 cf
Outflow = 4.90 cfs @ 12.04 hrs, Volume= 19,087 cf, Atten= 0%, Lag= 0.0 min
Primary = 4.90 cfs @ 12.04 hrs, Volume= 19,087 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.91' @ 12.23 hrs
Flood Elev= 143.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.05'	**18.0" Round Culvert** L= 79.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.05' / 137.65' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=139.99' TW=140.39' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-20: PDMH-20

Inflow Area = 13,200 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 1.68 cfs @ 12.04 hrs, Volume= 6,547 cf
Outflow = 1.68 cfs @ 12.04 hrs, Volume= 6,547 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.68 cfs @ 12.04 hrs, Volume= 6,547 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.54' @ 12.15 hrs
Flood Elev= 143.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	136.55'	**12.0" Round Culvert** L= 49.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 136.55' / 136.30' S= 0.0051 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=138.26' TW=139.21' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Summary for Pond DMH-21: PDMH-21

Inflow Area = 17,750 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 2.26 cfs @ 12.04 hrs, Volume= 8,803 cf
Outflow = 2.26 cfs @ 12.04 hrs, Volume= 8,803 cf, Atten= 0%, Lag= 0.0 min
Primary = 2.26 cfs @ 12.04 hrs, Volume= 8,803 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 139.09' @ 12.05 hrs
Flood Elev= 143.20'

Device	Routing	Invert	Outlet Devices
#1	Primary	138.10'	**12.0" Round Culvert** L= 69.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.10' / 137.70' S= 0.0058 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.02 cfs @ 12.04 hrs HW=139.06' TW=138.51' (Dynamic Tailwater)
1=Culvert (Outlet Controls 2.02 cfs @ 3.32 fps)

Summary for Pond DMH-22: PDMH-22

Inflow Area = 47,300 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 6.02 cfs @ 12.04 hrs, Volume= 23,459 cf
Outflow = 6.02 cfs @ 12.04 hrs, Volume= 23,459 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.02 cfs @ 12.04 hrs, Volume= 23,459 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 137.44' @ 12.04 hrs
Flood Elev= 139.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.15'	**15.0" Round Culvert** L= 135.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.15' / 134.50' S= 0.0048 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=5.65 cfs @ 12.04 hrs HW=137.28' (Free Discharge)
└**1=Culvert** (Barrel Controls 5.65 cfs @ 4.60 fps)

Summary for Pond DMH-23: PDMH-23

Inflow Area = 23,900 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 3.04 cfs @ 12.04 hrs, Volume= 11,854 cf
Outflow = 3.04 cfs @ 12.04 hrs, Volume= 11,854 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.04 cfs @ 12.04 hrs, Volume= 11,854 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 137.90' @ 12.12 hrs
Flood Elev= 138.60'

Device	Routing	Invert	Outlet Devices
#1	Primary	135.40'	**12.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 135.40' / 135.25' S= 0.0060 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 12.04 hrs HW=137.20' TW=137.28' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Summary for Pond PDMH-06: PDMH-06

Inflow Area = 108,581 sf,100.00% Impervious, Inflow Depth = 5.95" for 25-year event
Inflow = 13.83 cfs @ 12.04 hrs, Volume= 53,853 cf
Outflow = 13.83 cfs @ 12.04 hrs, Volume= 53,853 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.99 cfs @ 12.11 hrs, Volume= 46,178 cf
Secondary = 8.06 cfs @ 12.03 hrs, Volume= 7,675 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.10 hrs
Peak Elev= 140.51' @ 12.11 hrs
Flood Elev= 142.90'

Device	Routing	Invert	Outlet Devices
#1	Primary	137.50'	**12.0" Round Culvert** L= 10.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 137.50' / 137.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	138.55'	**18.0" Round Culvert** L= 25.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 138.55' / 137.50' S= 0.0420 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf

Primary OutFlow Max=5.95 cfs @ 12.11 hrs HW=140.47' (Free Discharge)
└**1=Culvert** (Inlet Controls 5.95 cfs @ 7.57 fps)

Secondary OutFlow Max=3.87 cfs @ 12.03 hrs HW=140.24' TW=140.04' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 3.87 cfs @ 2.19 fps)