Stormwater Management System Report

HATHAWAY COLLISION CENTER
PROPOSED SITE DEVELOPMENT

167 POTTER STREET
NEW BEDFORD, MASSACHUSETTS

Prepared for:

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Project No. 2097

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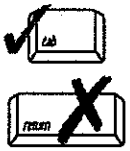
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

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.

[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) (Note:Within 100-foot Buffer Zone)
- ☐ 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): Subsurface Infiltration

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☒ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

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

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs) NOT APPLICABLE

☐ 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 NOT APPLICABLE

☐ 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.

Section 1

Hydrologic Overview

1.0 INTRODUCTION

1.1 Project Description

The applicant, Hathaway Collision Center is proposing to construct a 7,000 square foot prefabricated metal building to supplement their existing operations on the adjacent lot. The project will consists of construction of the building and paving a portion of the currently existing gravel parking areas. Remaining portions of the site will remain gravel and a landscape strip will be provided along the roadway. The purpose of the proposed building is to provide additional covered storage for vehicles in the process of being repaired as well as additional garage space for the applicants to work on cars. The site will be serviced by an on-site stormwater management system to attenuate the increase in rates of runoff that will be seen due to the construction of the proposed building and additional paved parking spaces. The on-site stormwater management system will consist of a subsurface recharge system to handle the clean water runoff from the new building. Stormwater from the remaining developed portions of the site will flow unattenuated off-site, as they do in pre-existing conditions.

The stormwater management system has been designed to accept and treat the projected stormwater flows from development in accordance with the current DEP Stormwater Management Standards. As part of the DEP Stormwater Management Standards and Regulations, the DEP is requiring Low Impact Development (LID) measures to be considered in the design of the project. The project, as proposed, does make use of certain LID measures including minimizing the amount of additional impervious area on the site and the proposed subsurface recharge system which will promote recharge to the groundwater on the site.

1.2 Hydrologic Overview

A hydrologic analysis for the pre and post developed conditions for the project site has been prepared and is submitted in the following sections of this report. The primary goal of this analysis is to evaluate and mitigate the potential impacts of the proposed construction to the adjacent properties and drainage system. Particular consideration has been given to stormwater quantity and quality to the off-site drainage systems. As the attached analysis shows, there is one distinct analysis point that has been analyzed. The analysis point and watershed areas are described in the following sections.

The analysis of the present condition and the proposed condition hydrology includes a calculated estimation of the runoff volume and peak storm flow rates from the site for each individual drainage area. The HydroCAD hydrologic program, developed by Applied Microcomputer Systems, was utilized in the preparation of the stormwater runoff models. The HydroCAD software is based upon the Soil Conservation Service, "Technical Release 20 – Urban Hydrology for Small Watersheds" and is a generally accepted industry standard methodology.

An analysis was performed for the 2, 10, 25 and 100-year frequency rainfall events. These events were based on a 24-hour duration storm with a SCS Type III storm distribution curve. Time of Concentration (Tc) values and runoff curve numbers (CN) were developed for each of the calculated existing and proposed drainage areas based upon prevalent topographic patterns, ground cover conditions, and SCS Hydrologic Soil Group classifications.

The hydrologic study area in the pre-developed condition consists of one (1) watershed areas with one (1) corresponding analysis point. The hydrologic study area in the post-developed condition consists of two (2) watershed areas and the same corresponding analysis point. The pre and post development watershed areas and corresponding analysis points are described in the following sections and shown on the Watershed Sketch Plans submitted in Appendix A.

The Bristol County Soil Conservation Service (SCS) mapping for this area indicates an Urban Soil type and this soil type was assumed to be Hydrologic Soil Group C in the hydrologic calculations.

1.3 Pre-Development Hydrologic Summary

In the present condition, the site is comprised of one (1) watershed areas as shown on the attached Pre Development Watershed Sketch Plan. The watershed designation and corresponding analysis point are as follows:

- Subcatchment PRE 1 is a 0.60-acre watershed area which consists of the entire parcel which flows unattenuated towards off-site drainage systems, which are taken as Analysis Point 1 (AP-1) in the analysis. The Time of Concentration for PRE-1 was assumed to be the minimum of 6.0 minutes and the CN was estimated to be 96.

A summary of the pre development hydrologic conditions for the 2, 10, 25, and 100-year storm events is submitted in Table 1.3 below.

Table 1.3 – Pre Development Hydrologic Summary

Storm Event	Analysis Point AP-1 Rate of Flow (c.f.s.)
2-year storm	1.98
10-year storm	2.76
25-year storm	3.24
100-year storm	4.08

1.4 Post Development Hydrologic Summary

In the developed condition, the site is comprised of two (2) watershed areas as shown on the attached Post Development Watershed Plan. The designated post development analysis point corresponds to the previously described pre development analysis point. The watershed designations and corresponding analysis points for each of the post development watersheds are as follows:

- Subcatchment POST 1 is a 0.16-acre portion of the overall watershed area consisting of the roof area of the proposed garage which will flow to a subsurface roof drain recharge system (Pond RECH) prior to overtopping towards the off-site drainage systems, which are taken as Analysis Point 1 (AP-1) in the analysis. The Time of Concentration for POST 1 was assumed to be the minimum of 6.0 minutes and the CN was estimated to be 98.

- Subcatchment POST 2 is a 0.44-acre portion of the overall watershed area consisting of the remaining portions of the lot which will flow unattenuated to the off-site drainage systems, which are taken as Analysis Point 1 (AP-1) in the analysis. The Time of Concentration for POST 2 was assumed to be the minimum of 6.0 minutes and the CN was estimated to be 96.

A summary of the post-development hydrologic conditions for the 2, 10, 25, and 100-year storm events is submitted in Table 1.4 below.

Table 1.4 – Post Development Hydrologic Summary

Storm Event	Analysis Point AP-1 Rate of Flow (c.f.s.)
2-year storm	1.98
10-year storm	2.76
25-year storm	3.22
100-year storm	4.02

The hydrologic analysis indicates that the stormwater management system design for the site meets or reduces peak runoff rates for the 2, 10, 25, and 100 year, 24 hour, Type III storm events from the pre developed levels at the analysis point.

1.5 Stormwater Management System Summary

The proposed stormwater management system incorporates a number of Best Management Practices (BMPs), as prescribed in the Department of Environmental Protection Stormwater Management Handbook. These practices include structural and non-structural measures providing stormwater quantity and quality management. These BMPs will function to minimize potential adverse water quality impacts to the surrounding wetland ecosystem. The following sections describe the temporary and permanent stormwater BMPs proposed for the site development.

The proposed stormwater management plan has been developed based on the projected site conditions and the present condition of the water resource areas that receive stormwater runoff from the site. The proposed BMPs have been designed to comply with the Massachusetts Stormwater Management Handbook.

The existing and proposed paved and impervious areas on the developed lot are the primary target area for water quantity and quality control measures for the project. In existing conditions, there is no treatment or attenuation being provided to the runoff generated by the impervious surfaces on the lot. The majority of this runoff flows overland directly to off-site drainage systems adjacent to the project site. The goal of the proposed stormwater management system design was to provide the necessary attenuation for the increased impervious surface on the project site. The amount of gravel surface on the site has also been reduced therefore reducing the amount of sediment-laden runoff produced by the gravel surfaces being discharged to the off-site drainage systems.

1.6 Select Structural Best Management Practices (BMP's)

Roof Drain Recharge System

Runoff from the clean roof drains from the new building will be discharged to a subsurface roof drain recharge system located on-site. The subsurface system will consist of plastic parabolic Cultec Contactor leaching chambers on a bed of double washed stone. These systems have been sized to provide storage volume to for up to the 100 year storm event. These systems will achieve recharge to the groundwater through the underlying soils.

1.7 Select Non-Structural Best Management Practices (BMP's)

Stormwater Management System Maintenance Program

All structural components of the stormwater management system will be inspected and maintained of a regular basis in accordance with the requirements of the Stormwater Management Policy. A detailed Stormwater Management System Operation and Maintenance Plan has been prepared in accordance with the newly promulgated Stormwater Management Standards and Stormwater Management Handbook prepared by the Massachusetts Department of Environmental Protection.

1.8 Regulatory Compliance

The Massachusetts Stormwater Handbook, Volume 3 (February, 2008), has been used as the primary guidance for the selection and design of permanent non-structural and structural BMPs for the long-term protection of existing wetland and water resources. The Stormwater Management Plan developed for this project incorporates water quantity and quality controls that will protect surface and groundwater resources, wetlands and adjacent properties from potential impacts due to increased impervious areas on the site. The Stormwater Management Plan also incorporates select LID measures in accordance with the new Stormwater Management Policies.

The stormwater performance standards developed by the DEP and a brief discussion on how the proposed project will achieve the standards are provided below.

Standard 1. **No new stormwater conveyances may discharge untreated stormwater directly to, or cause erosion in wetlands or waters of the Commonwealth.**

- No proposed site stormwater conveyance system will discharge untreated stormwater runoff directly to wetlands. Stormwater runoff from newly developed areas will run through either a roof drain recharge system or directly to off-site drainage systems.

Standard 2. **Stormwater management systems shall be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates.**

- The storage volume within the roof drain recharge system will serve to limit the peak rates of stormwater runoff at or below pre development levels for the 2-, 10-, 25- and 100-year storm events. Refer to the Calculations in Sections 3 & 4 for additional information.

Standard 3. **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.**

- Provisions for groundwater recharge have been provided with the subsurface infiltration system handling the clean roof runoff from the site.

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

a) **Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;**
b) **Structural stormwater best management practices are sized to capture the required water quality volume as determined in accordance with the Massachusetts Stormwater Handbook; and**
c) **Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.**

- There is an overall decrease in the amount of gravel surfaces on the site that could provide sediment-laden runoff off site. The off-site stormwater management systems will continue to serve to reduce the amount of TSS in the runoff prior to ultimate discharge.

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

- The proposed project is not considered a high intensity use with higher potential pollutant loads.

Standard 6. **Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.**

- The project does not discharge stormwater to any designated critical areas as defined in the Massachusetts Stormwater Handbook.

Standard 7. **A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural 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.**

- This standard is not applicable as this is not a redevelopment of a previously developed site.

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

- The proposed development will incorporate erosion and sedimentation controls to minimize the potential for sedimentation in down gradient resources. These controls will include hay bales or silt fence barriers, and slope stabilization measures such as hay/straw blankets and jute matting, if necessary.

Standard 9. **A Long -Term Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.**

- The Stormwater Management Plan for this project has been developed in full compliance with the DEP Stormwater Management Policy. The Plan is based on a multi-dimensional approach to stormwater management that recognizes the need for proper site planning, source control of potential contaminants, and implementation of structural and non-structural treatment methods to ensure the protection of water resources in the vicinity of the site and adjacent properties. The Stormwater Operation and Maintenance Plan is provided on the construction drawings. A more detailed Long-Term Operation and Maintenance Plan is also included in the in the following sections.

Standard 10. **Illicit Discharges to the Stormwater Management System are prohibited.**

- An Illicit Discharge Compliance Statement has been completed and is included as an Appendix to this Report.

1.9 Post Construction Operation and Maintenance Plan

Name and current address of the Applicant

Hathaway Collision Center
175 Potter Street
New Bedford, Massachusetts 02745

Plans of Record

Refer to Site Development Plans prepared for H&M Dartmouth Realty LLC by Field Engineering and last dated 8/12/2016 for locations of all BMP's on site as well as construction details of all BMP's.

1. The contractor shall be responsible for the proper inspection and maintenance of all stormwater management facilities until such time as the Stormwater Management System is accepted by the Owner. Thereafter the Owner shall be responsible for the proper inspection and maintenance of the stormwater facilities in accordance with this Operation and Maintenance Plan as well as the continuing conditions of the Certificate of Compliance on the property.

2. All Structural Best Management Practices (BMP's) including the Roof Drain Recharge SYstem, should be inspected after every major rainfall event exceeding 1.0-inch for the first 6 months after construction to ensure proper stabilization and construction.

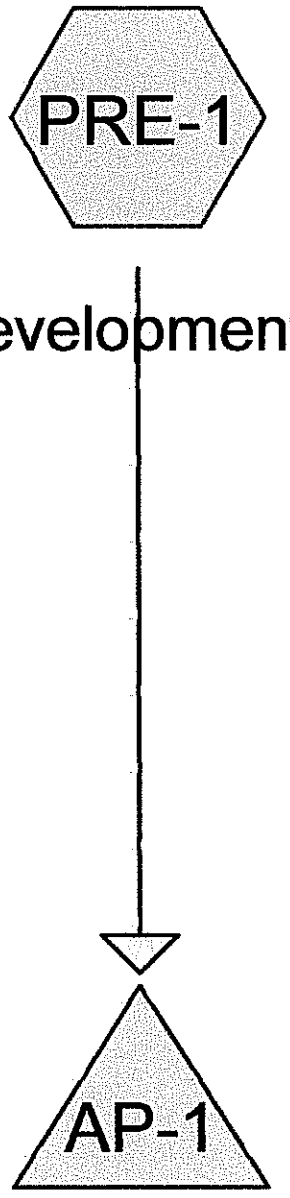
3. Thereafter, regular BMP inspections should be conducted according to the following schedule:

BMP Structure	Inspections per Year
Roof Drain Recharge System	1

4. No disposal of materials shall be permitted within the buffer zones or wetlands on the project site. This prohibition applies to trash, fill material, construction debris, grass clippings, collected leaves and cut branches.

Section 2

Pre Development Hydrologic Analysis



Subcat Reach Pond Link

Routing Diagram for 2097-Pre Development
Prepared by {enter your company name here}

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.586	96	Gravel surface, HSG C (PRE-1)
0.014	98	Paved parking & roofs (PRE-1)
0.600	**96**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 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 PRE-1: Pre Development Runoff Area=26,130 sf 2.38% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=96 Runoff=1.98 cfs 0.152 af

Pond AP-1: Analysis Point 1 Inflow=1.98 cfs 0.152 af
Primary=1.98 cfs 0.152 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.152 af Average Runoff Depth = 3.04"
97.62% Pervious = 0.586 ac 2.38% Impervious = 0.014 ac

Summary for Subcatchment PRE-1: Pre Development Area

Pre Development Area 1 consists of the entire property the discharges runoff to off-site drainage systems.

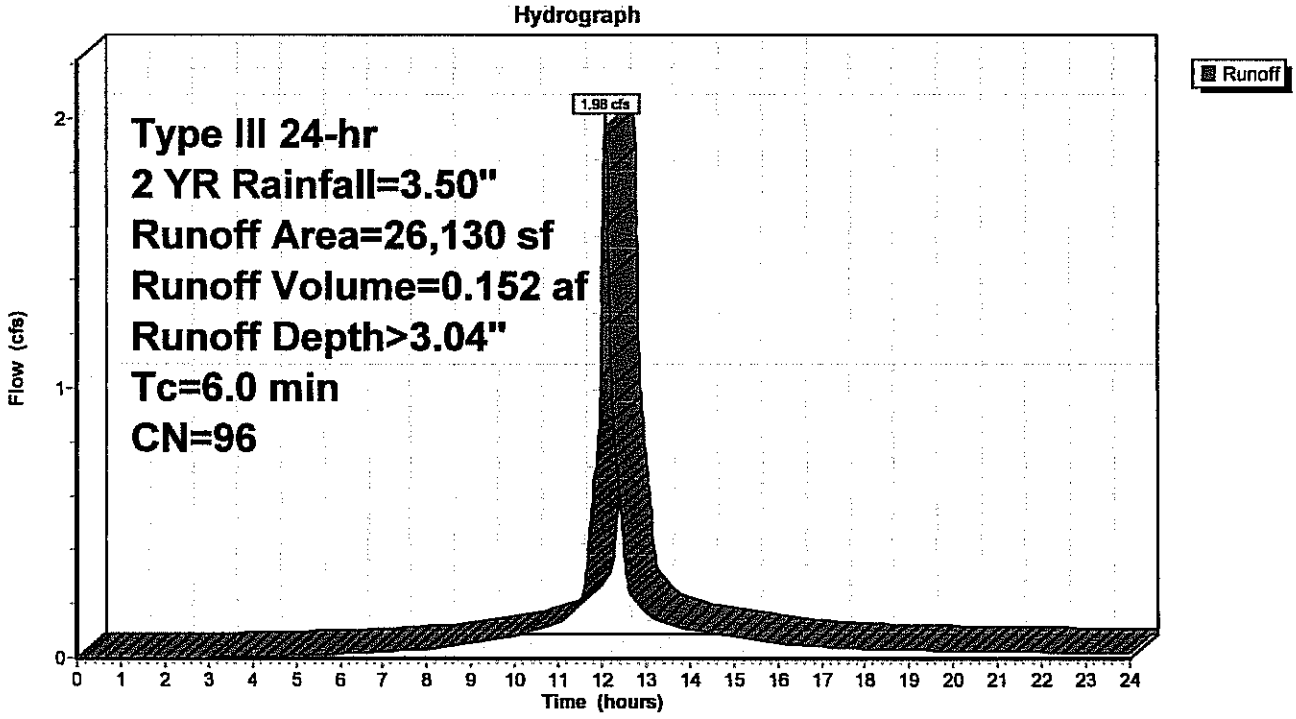
Runoff = 1.98 cfs @ 12.08 hrs, Volume= 0.152 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 YR Rainfall=3.50"

Area (sf)	CN	Description
621	98	Paved parking & roofs
25,509	96	Gravel surface, HSG C
26,130	96	Weighted Average
25,509		97.62% Pervious Area
621		2.38% Impervious Area

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

Subcatchment PRE-1: Pre Development Area



Summary for Pond AP-1: Analysis Point 1

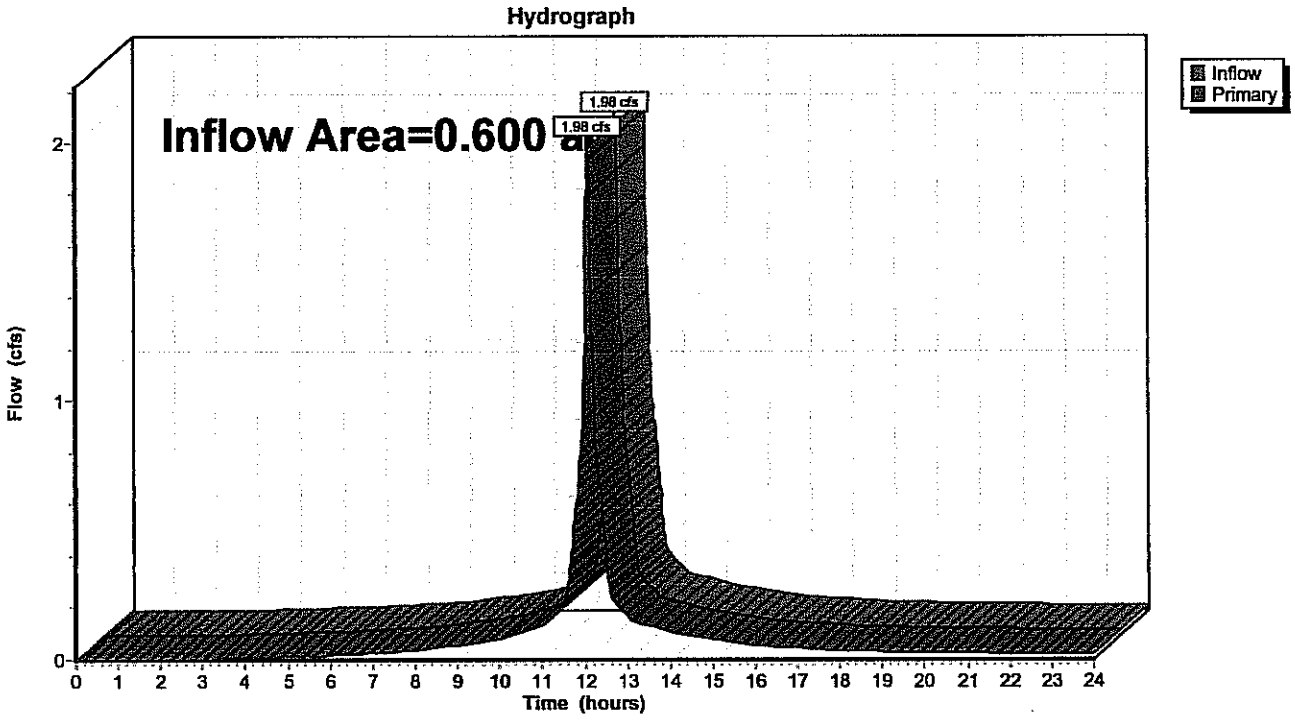
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area = 0.600 ac, 2.38% Impervious, Inflow Depth > 3.04" for 2 YR event
Inflow = 1.98 cfs @ 12.08 hrs, Volume= 0.152 af
Primary = 1.98 cfs @ 12.08 hrs, Volume= 0.152 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Pond AP-1: Analysis Point 1



Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 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 PRE-1: Pre Development Runoff Area=26,130 sf 2.38% Impervious Runoff Depth>4.33"
Tc=6.0 min CN=96 Runoff=2.76 cfs 0.216 af

Pond AP-1: Analysis Point 1 Inflow=2.76 cfs 0.216 af
Primary=2.76 cfs 0.216 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.216 af Average Runoff Depth = 4.33"
97.62% Pervious = 0.586 ac 2.38% Impervious = 0.014 ac

Summary for Subcatchment PRE-1: Pre Development Area

Pre Development Area 1 consists of the entire property the discharges runoff to off-site drainage systems.

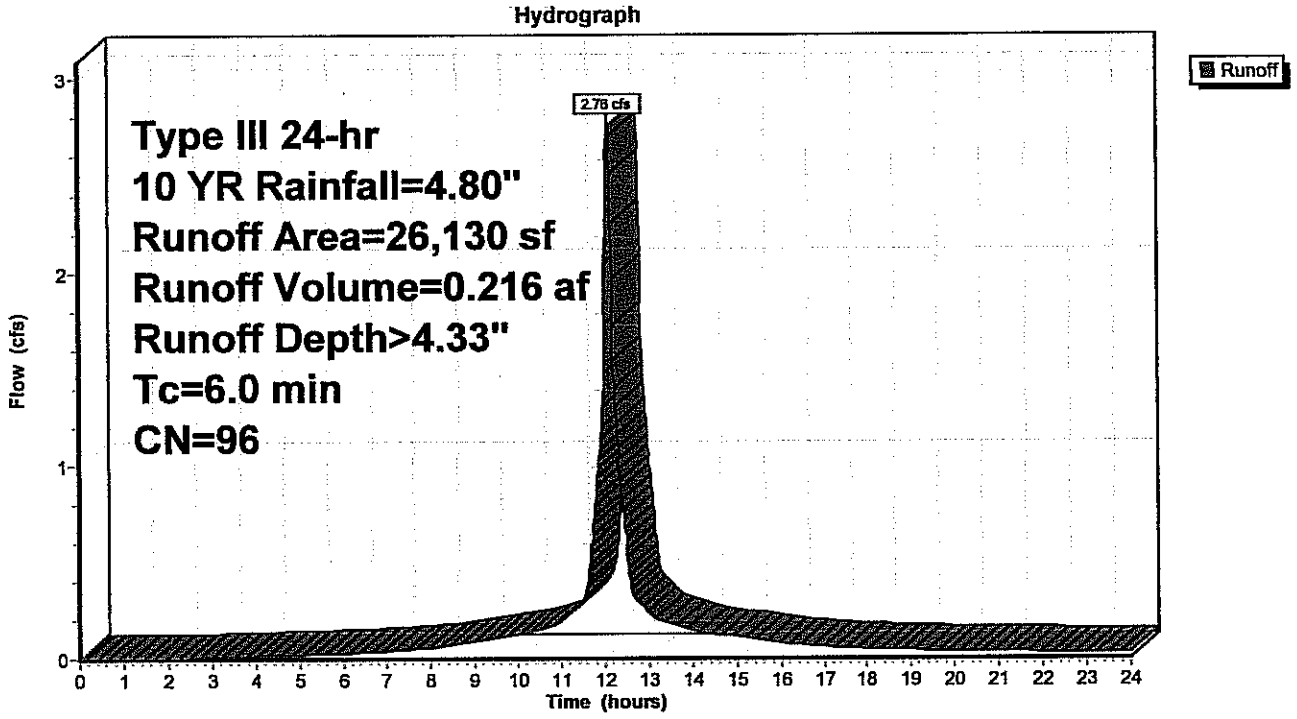
Runoff = 2.76 cfs @ 12.08 hrs, Volume= 0.216 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 YR Rainfall=4.80"

Area (sf)	CN	Description
621	98	Paved parking & roofs
25,509	96	Gravel surface, HSG C
26,130	96	Weighted Average
25,509		97.62% Pervious Area
621		2.38% Impervious Area

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

Subcatchment PRE-1: Pre Development Area



Summary for Pond AP-1: Analysis Point 1

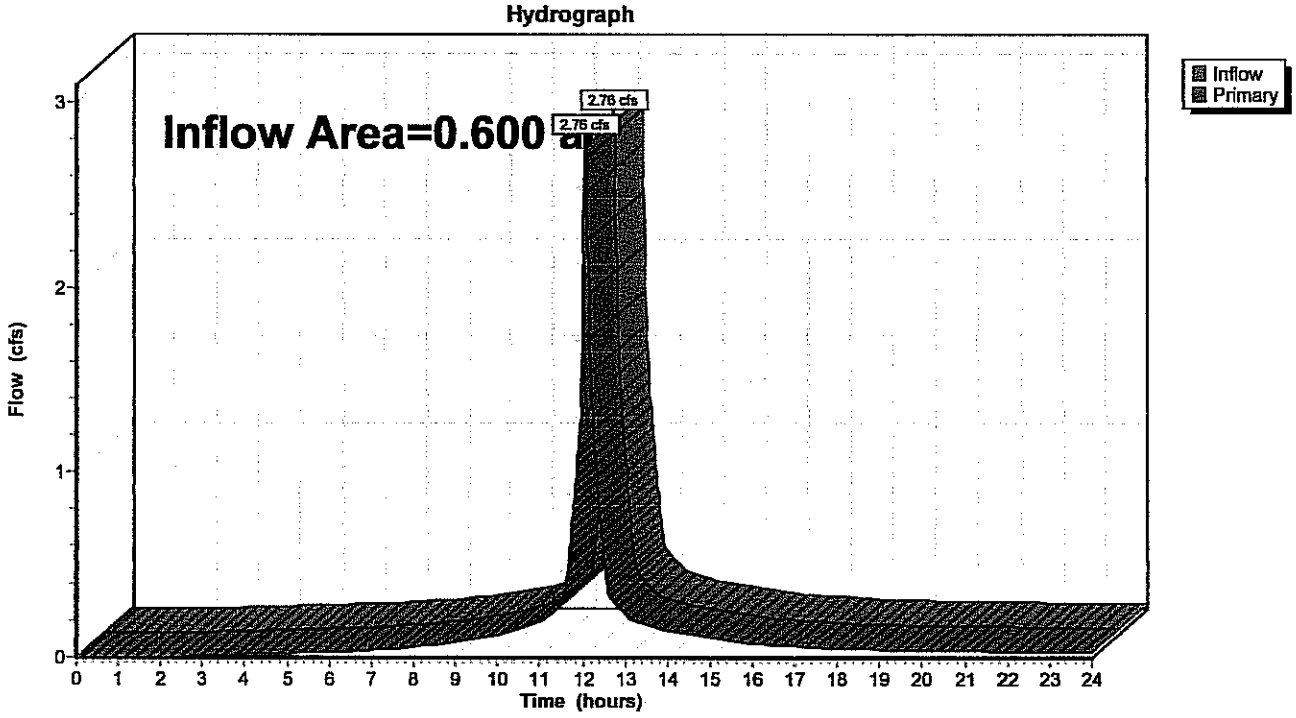
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area =	0.600 ac,	2.38% Impervious,	Inflow Depth >	4.33"	for 10 YR event
Inflow =	2.76 cfs @	12.08 hrs, Volume=	0.216 af		
Primary =	2.76 cfs @	12.08 hrs, Volume=	0.216 af,	Atten= 0%,	Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Pond AP-1: Analysis Point 1



Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 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 PRE-1: Pre Development Runoff Area=26,130 sf 2.38% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=96 Runoff=3.24 cfs 0.256 af

Pond AP-1: Analysis Point 1 Inflow=3.24 cfs 0.256 af
Primary=3.24 cfs 0.256 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.256 af Average Runoff Depth = 5.13"
97.62% Pervious = 0.586 ac 2.38% Impervious = 0.014 ac

Summary for Subcatchment PRE-1: Pre Development Area

Pre Development Area 1 consists of the entire property the discharges runoff to off-site drainage systems.

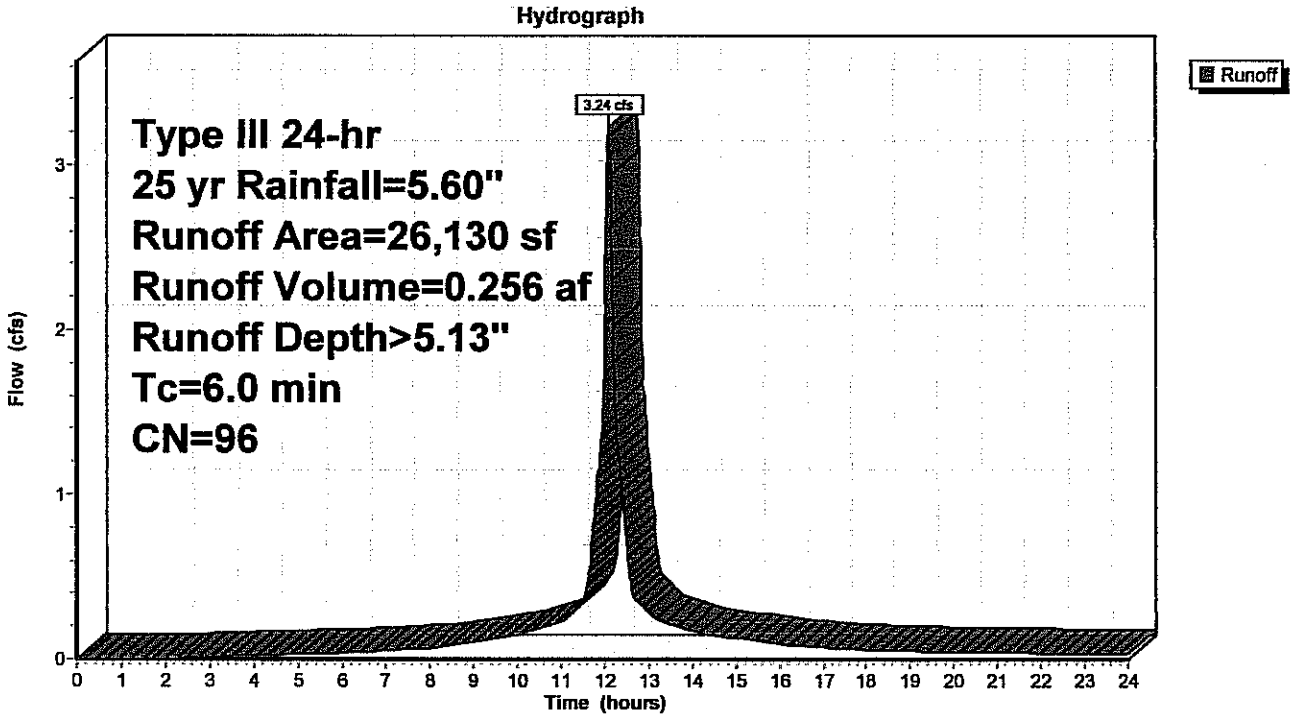
Runoff = 3.24 cfs @ 12.08 hrs, Volume= 0.256 af, Depth> 5.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr Rainfall=5.60"

Area (sf)	CN	Description
621	98	Paved parking & roofs
25,509	96	Gravel surface, HSG C
26,130	96	Weighted Average
25,509		97.62% Pervious Area
621		2.38% Impervious Area

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

Subcatchment PRE-1: Pre Development Area



Summary for Pond AP-1: Analysis Point 1

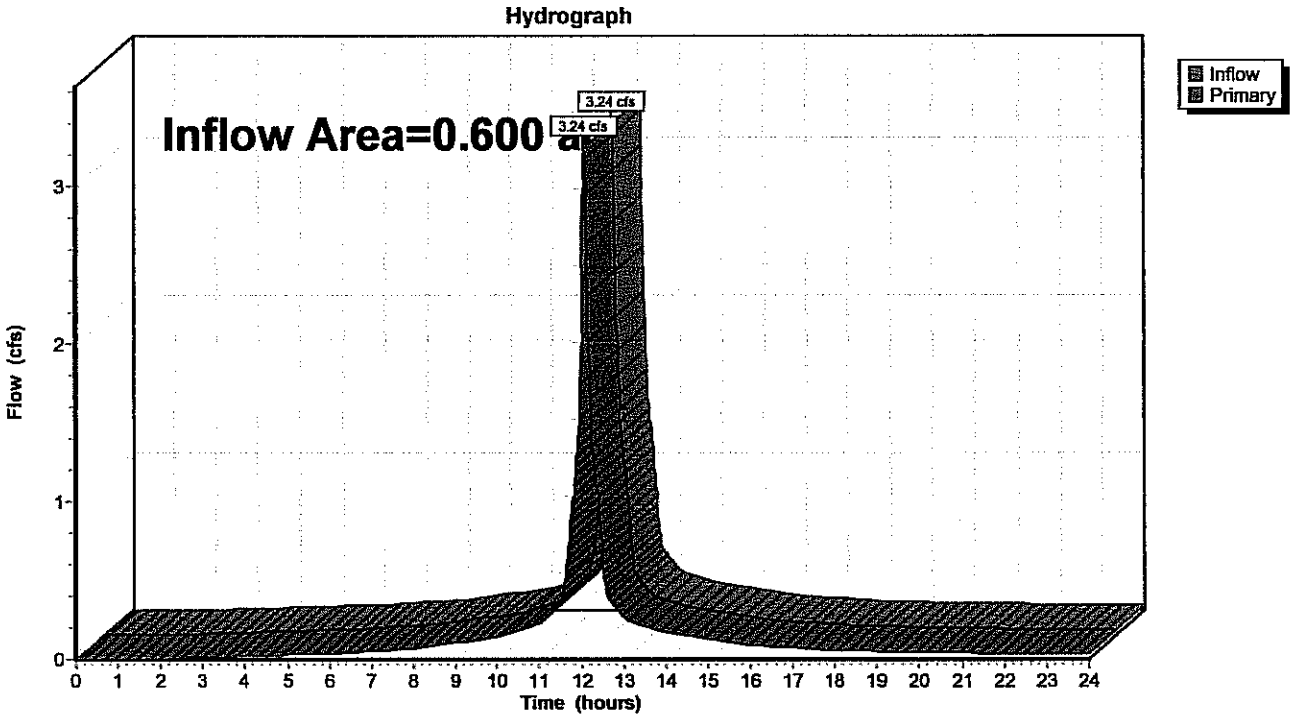
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area =	0.600 ac,	2.38% Impervious,	Inflow Depth >	5.13"	for 25 yr event
Inflow =	3.24 cfs @	12.08 hrs,	Volume=	0.256 af	
Primary =	3.24 cfs @	12.08 hrs,	Volume=	0.256 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Pond AP-1: Analysis Point 1



Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 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 PRE-1: Pre Development Runoff Area=26,130 sf 2.38% Impervious Runoff Depth>6.52"
Tc=6.0 min CN=96 Runoff=4.08 cfs 0.326 af

Pond AP-1: Analysis Point 1 Inflow=4.08 cfs 0.326 af
Primary=4.08 cfs 0.326 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.326 af Average Runoff Depth = 6.52"
97.62% Pervious = 0.586 ac 2.38% Impervious = 0.014 ac

Summary for Subcatchment PRE-1: Pre Development Area

Pre Development Area 1 consists of the entire property the discharges runoff to off-site drainage systems.

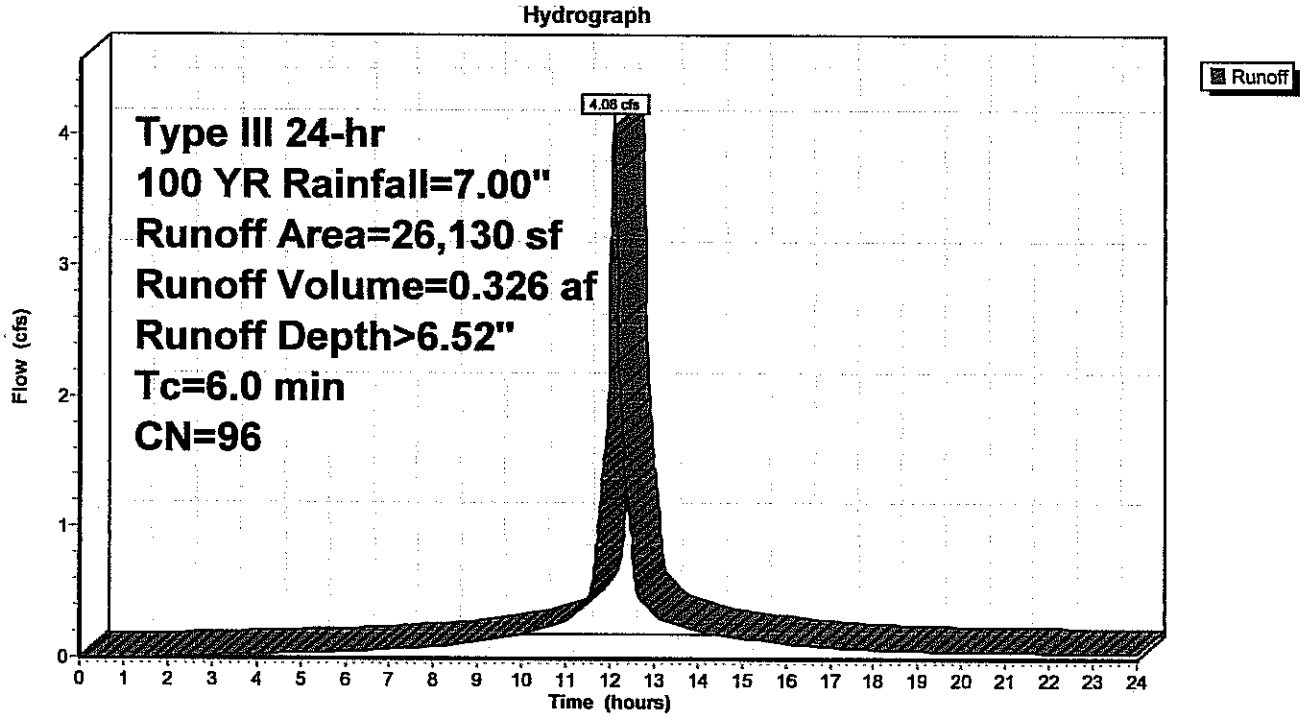
Runoff = 4.08 cfs @ 12.08 hrs, Volume= 0.326 af, Depth> 6.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
621	98	Paved parking & roofs
25,509	96	Gravel surface, HSG C
26,130	96	Weighted Average
25,509		97.62% Pervious Area
621		2.38% Impervious Area

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

Subcatchment PRE-1: Pre Development Area



Summary for Pond AP-1: Analysis Point 1

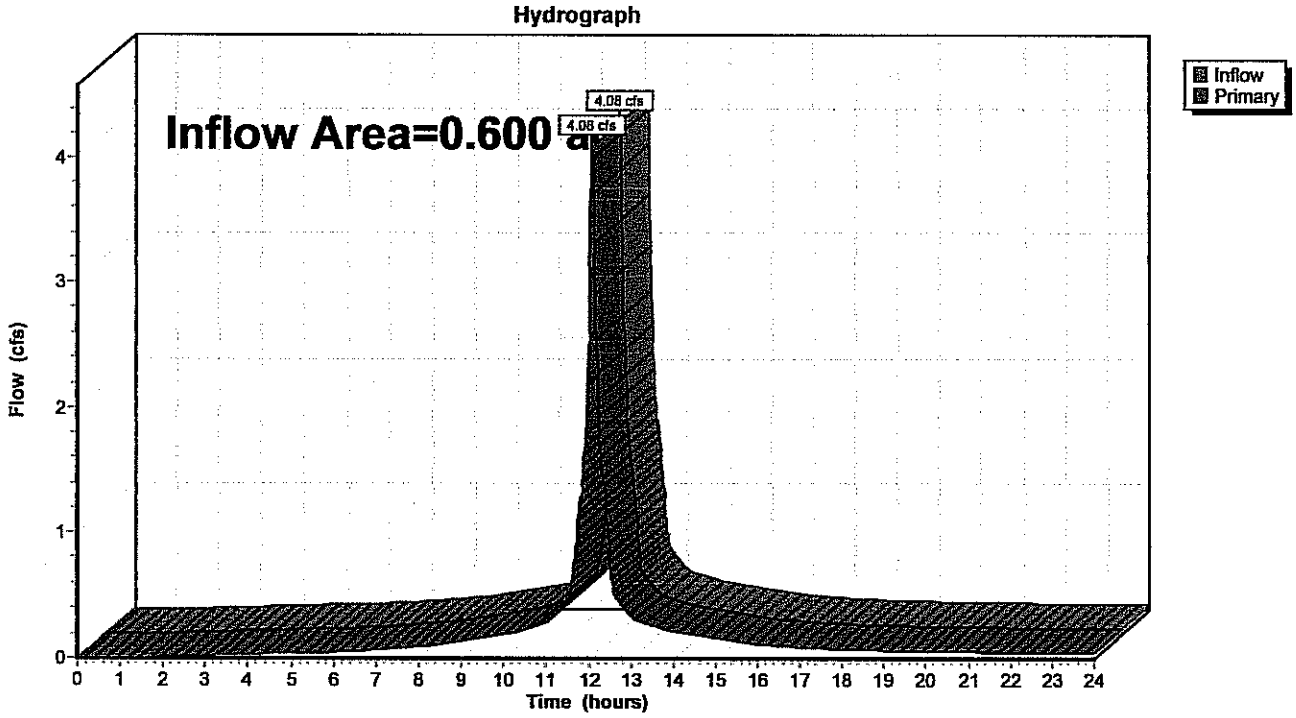
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area = 0.600 ac, 2.38% Impervious, Inflow Depth > 6.52" for 100 YR event
Inflow = 4.08 cfs @ 12.08 hrs, Volume= 0.326 af
Primary = 4.08 cfs @ 12.08 hrs, Volume= 0.326 af, Atten= 0%, Lag= 0.0 min

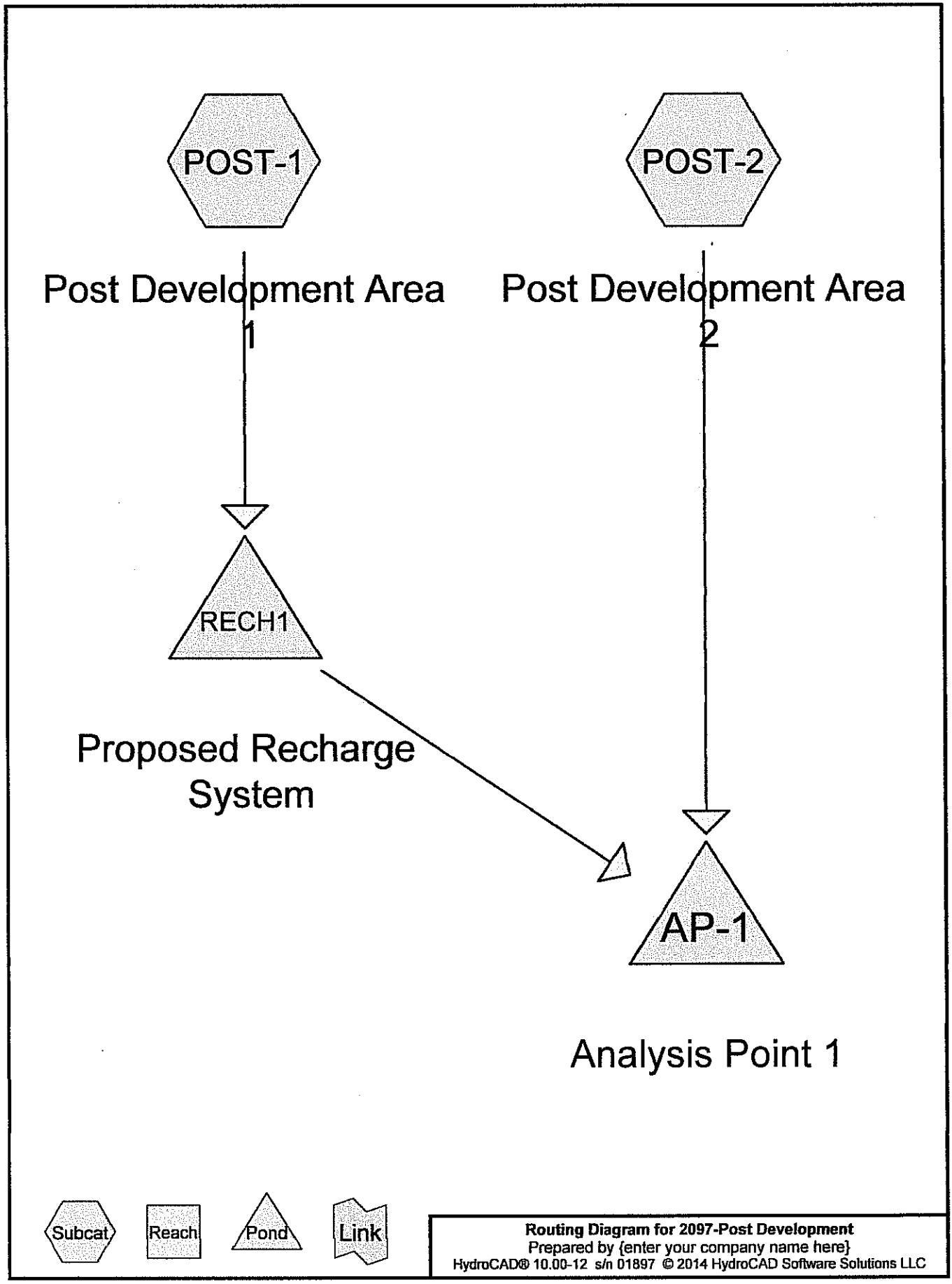
Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs

Pond AP-1: Analysis Point 1



Section 3

Post Development Hydrologic Analysis


POST-1
POST-2
Post Development Area 1
Post Development Area 2
RECH1
Proposed Recharge System
AP-1
Analysis Point 1
Subcat
Reach
Pond
Link
Routing Diagram for 2097-Post Development
Prepared by {enter your company name here}
HydroCAD® 10.00-12 s/n 01897 © 2014 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.016	74	>75% Grass cover, Good, HSG C (POST-2)
0.219	96	Gravel surface, HSG C (POST-2)
0.365	98	Paved parking & roofs (POST-1, POST-2)
0.600	**97**	**TOTAL AREA**

Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
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 POST-1: Post Development Runoff Area=7,000 sf 100.00% Impervious Runoff Depth>3.26"
Tc=6.0 min CN=98 Runoff=0.55 cfs 0.044 af

Subcatchment POST-2: Post Development Runoff Area=19,130 sf 46.52% Impervious Runoff Depth>3.04"
Tc=6.0 min CN=96 Runoff=1.45 cfs 0.111 af

Pond AP-1: Analysis Point 1 Inflow=1.98 cfs 0.134 af
Primary=1.98 cfs 0.134 af

Pond RECH1: Proposed Recharge System Peak Elev=95.64' Storage=376 cf Inflow=0.55 cfs 0.044 af
Discarded=0.01 cfs 0.013 af Primary=0.54 cfs 0.023 af Outflow=0.54 cfs 0.036 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.155 af Average Runoff Depth = 3.10"
39.15% Pervious = 0.235 ac 60.85% Impervious = 0.365 ac

Summary for Subcatchment POST-1: Post Development Area 1

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

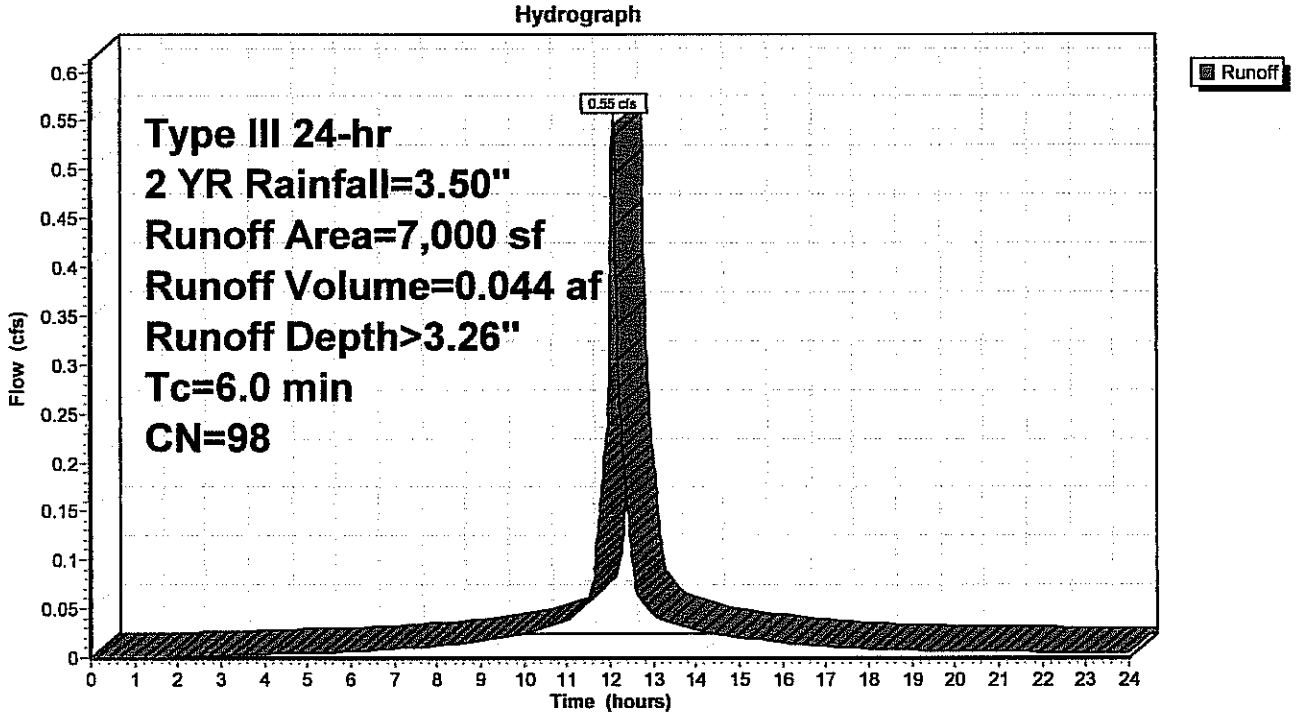
Runoff = 0.55 cfs @ 12.08 hrs, Volume= 0.044 af, Depth> 3.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 YR Rainfall=3.50"

Area (sf)	CN	Description
7,000	98	Paved parking & roofs
7,000		100.00% Impervious Area

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

Subcatchment POST-1: Post Development Area 1



Summary for Subcatchment POST-2: Post Development Area 2

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

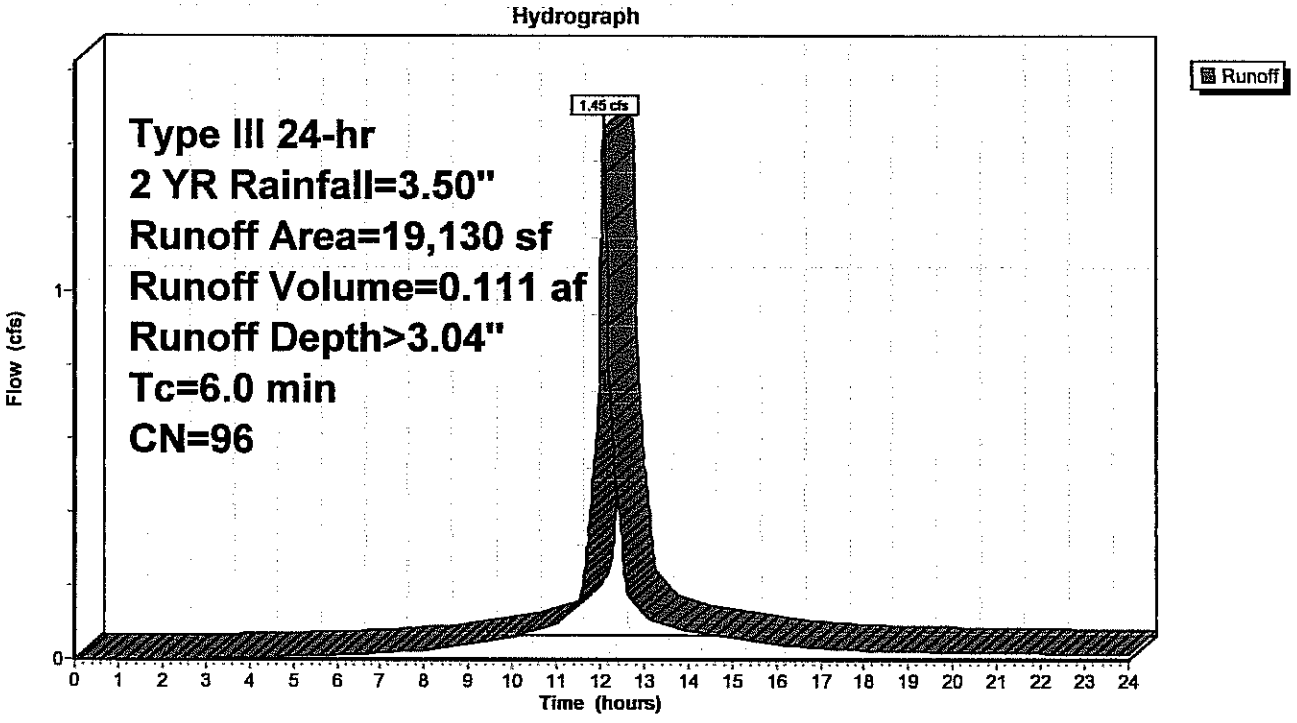
Runoff = 1.45 cfs @ 12.08 hrs, Volume= 0.111 af, Depth> 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 YR Rainfall=3.50"

Area (sf)	CN	Description
8,900	98	Paved parking & roofs
9,530	96	Gravel surface, HSG C
700	74	>75% Grass cover, Good, HSG C
19,130	96	Weighted Average
10,230		53.48% Pervious Area
8,900		46.52% Impervious Area

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

Subcatchment POST-2: Post Development Area 2



Summary for Pond AP-1: Analysis Point 1

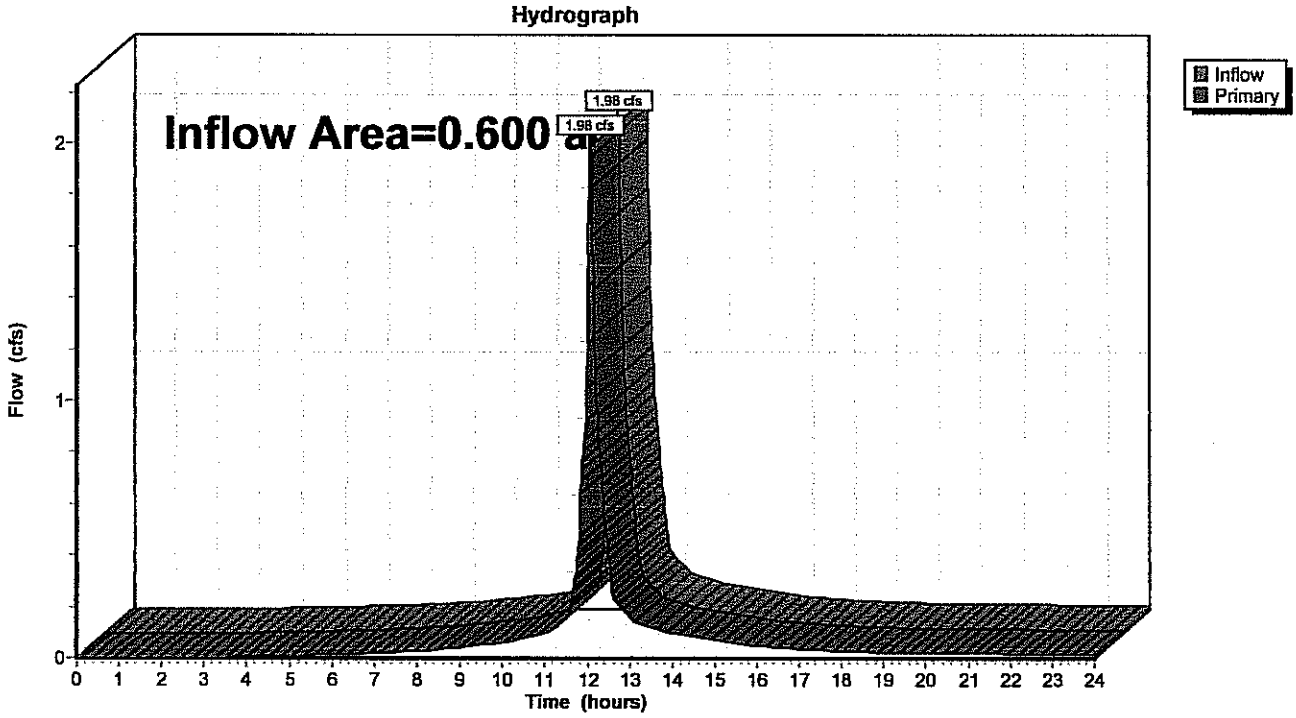
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area =	0.600 ac,	60.85% Impervious,	Inflow Depth >	2.68" for 2 YR event
Inflow =	1.98 cfs @	12.09 hrs, Volume=	0.134 af	
Primary =	1.98 cfs @	12.09 hrs, Volume=	0.134 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Pond AP-1: Analysis Point 1



Summary for Pond RECH1: Proposed Recharge System

Inflow Area =	0.161 ac,100.00% Impervious,	Inflow Depth >	3.26"	for 2 YR event
Inflow =	0.55 cfs @	12.08 hrs, Volume=	0.044 af	
Outflow =	0.54 cfs @	12.09 hrs, Volume=	0.036 af,	Atten= 0%, Lag= 0.4 min
Discarded =	0.01 cfs @	7.32 hrs, Volume=	0.013 af	
Primary =	0.54 cfs @	12.09 hrs, Volume=	0.023 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 95.64' @ 12.09 hrs Surf.Area= 340 sf Storage= 376 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 37.2 min (791.2 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.50'	289 cf	**8.50'W x 40.00'L x 2.54'H Field A** 864 cf Overall - 141 cf Embedded = 723 cf x 40.0% Voids
#2A	94.50'	141 cf	**Cultec C-100HD** x 10 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		431 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	95.50'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 7.32 hrs HW=93.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.53 cfs @ 12.09 hrs HW=95.64' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Weir Controls 0.53 cfs @ 1.22 fps)

Pond RECH1: Proposed Recharge System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 2 rows

36.0" Wide + 6.0" Spacing = 42.0" C-C Row Spacing

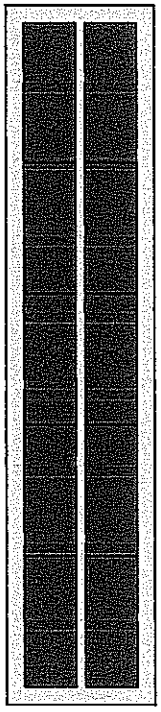
5 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 38.00' Row Length +12.0" End Stone x 2 = 40.00' Base Length
2 Rows x 36.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.50' Base Width
12.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.54' Field Height

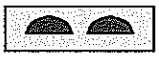
10 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 2 Rows = 141.5 cf Chamber Storage

864.2 cf Field - 141.5 cf Chambers = 722.7 cf Stone x 40.0% Voids = 289.1 cf Stone Storage

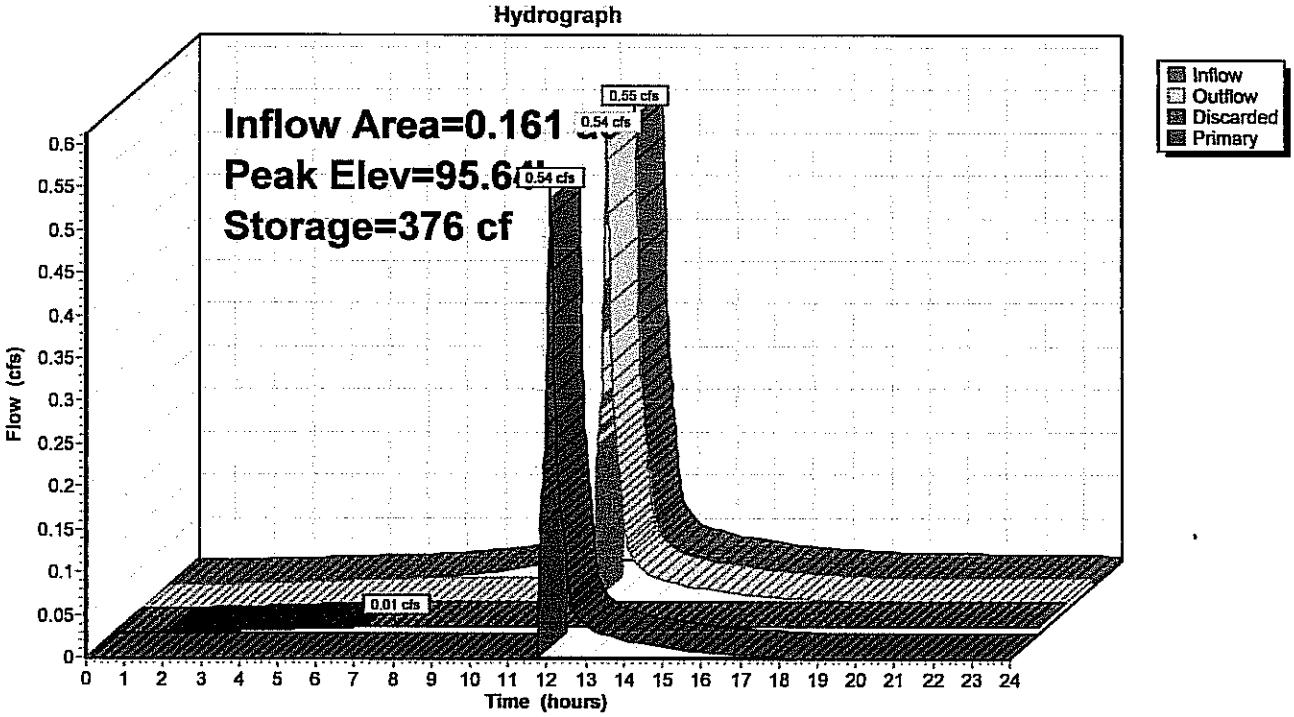
Chamber Storage + Stone Storage = 430.6 cf = 0.010 af
Overall Storage Efficiency = 49.8%

10 Chambers
32.0 cy Field
26.8 cy Stone





Pond RECH1: Proposed Recharge System



Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
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 POST-1: Post Development Runoff Area=7,000 sf 100.00% Impervious Runoff Depth>4.56"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.061 af

Subcatchment POST-2: Post Development Runoff Area=19,130 sf 46.52% Impervious Runoff Depth>4.33"
Tc=6.0 min CN=96 Runoff=2.02 cfs 0.158 af

Pond AP-1: Analysis Point 1 Inflow=2.76 cfs 0.197 af
Primary=2.76 cfs 0.197 af

Pond RECH1: Proposed Recharge System Peak Elev=95.67' Storage=380 cf Inflow=0.75 cfs 0.061 af
Discarded=0.01 cfs 0.014 af Primary=0.74 cfs 0.039 af Outflow=0.75 cfs 0.053 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.220 af Average Runoff Depth = 4.39"
39.15% Pervious = 0.235 ac 60.85% Impervious = 0.365 ac

Summary for Subcatchment POST-1: Post Development Area 1

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

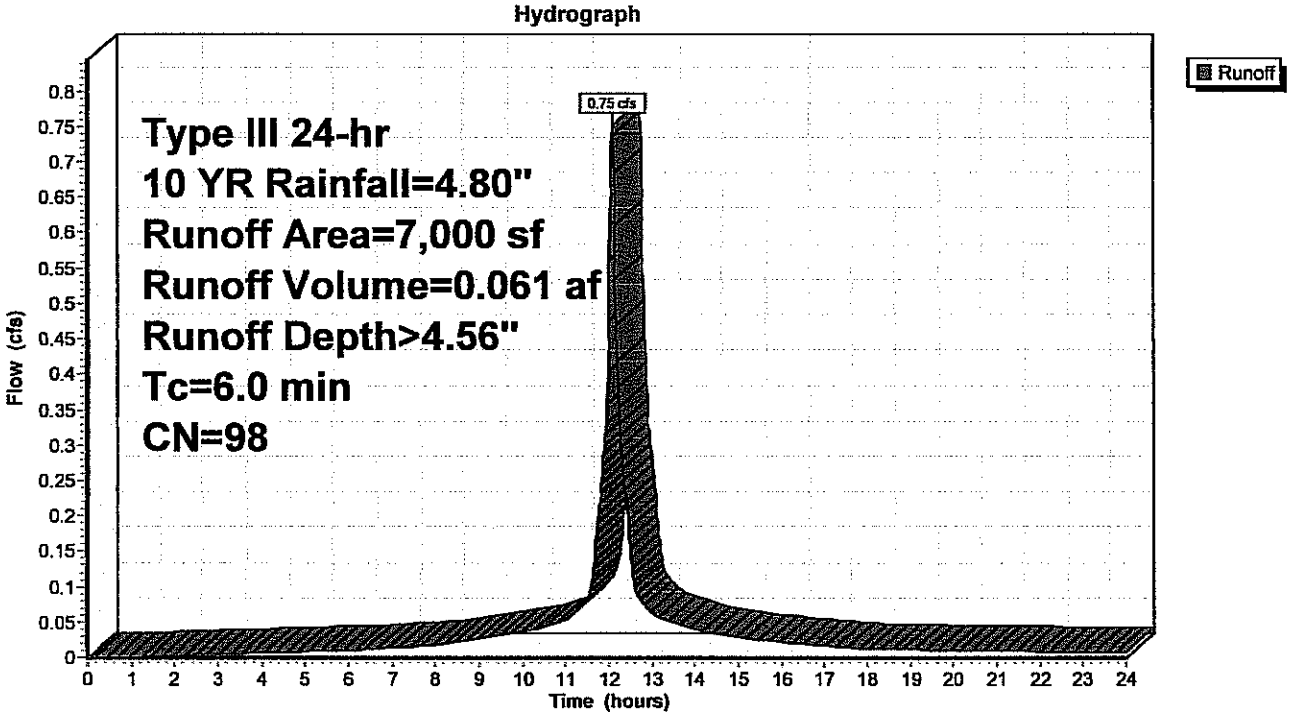
Runoff = 0.75 cfs @ 12.08 hrs, Volume= 0.061 af, Depth> 4.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 YR Rainfall=4.80"

Area (sf)	CN	Description
7,000	98	Paved parking & roofs
7,000		100.00% Impervious Area

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

Subcatchment POST-1: Post Development Area 1



Summary for Subcatchment POST-2: Post Development Area 2

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

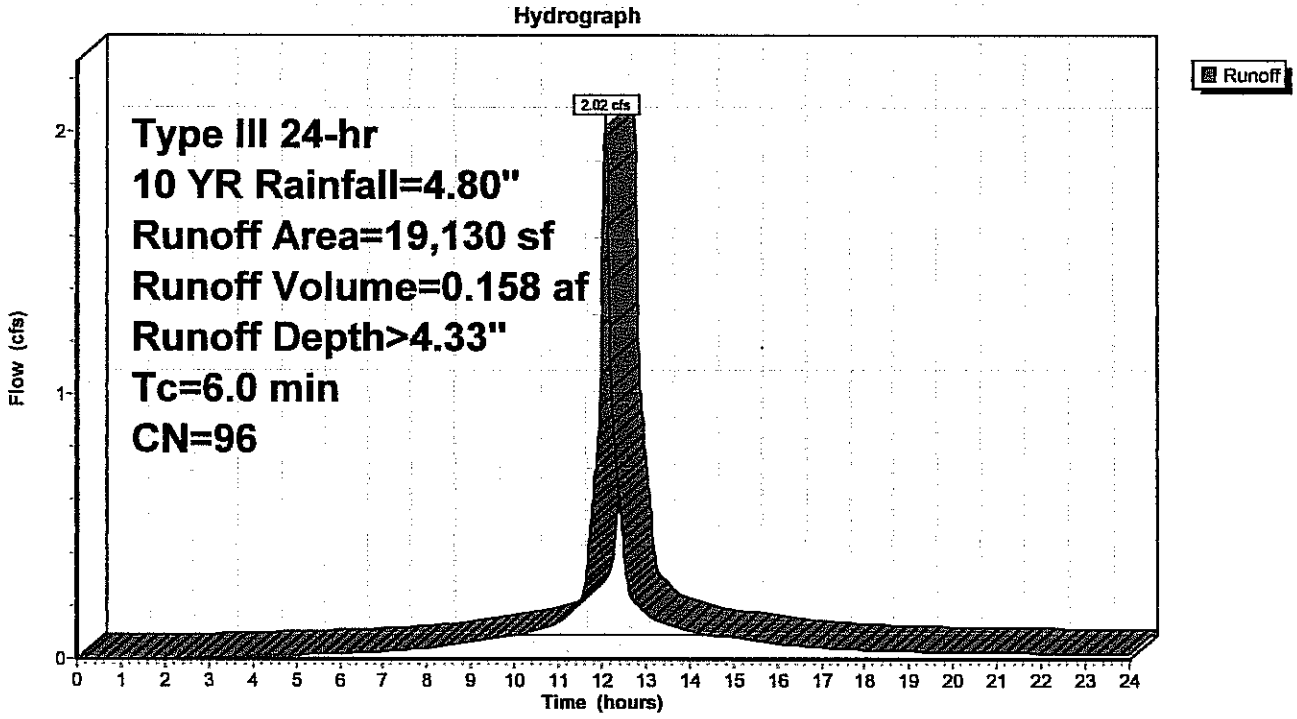
Runoff = 2.02 cfs @ 12.08 hrs, Volume= 0.158 af, Depth> 4.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 10 YR Rainfall=4.80"

Area (sf)	CN	Description
8,900	98	Paved parking & roofs
9,530	96	Gravel surface, HSG C
700	74	>75% Grass cover, Good, HSG C
19,130	96	Weighted Average
10,230		53.48% Pervious Area
8,900		46.52% Impervious Area

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

Subcatchment POST-2: Post Development Area 2



Summary for Pond AP-1: Analysis Point 1

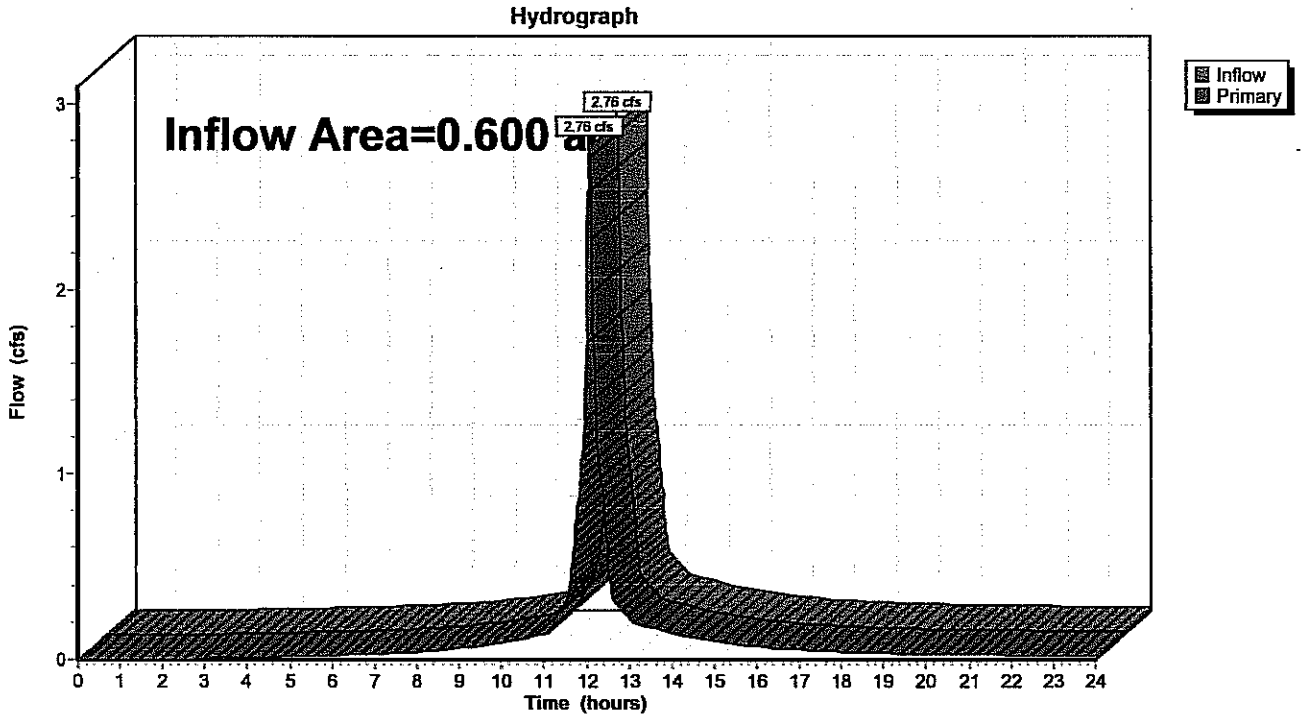
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area =	0.600 ac,	60.85% Impervious,	Inflow Depth >	3.95"	for 10 YR event
Inflow =	2.76 cfs @	12.09 hrs,	Volume=	0.197 af	
Primary =	2.76 cfs @	12.09 hrs,	Volume=	0.197 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Pond AP-1: Analysis Point 1



Summary for Pond RECH1: Proposed Recharge System

Inflow Area =	0.161 ac,100.00% Impervious,	Inflow Depth >	4.56"	for 10 YR event
Inflow =	0.75 cfs @	12.08 hrs, Volume=	0.061 af	
Outflow =	0.75 cfs @	12.09 hrs, Volume=	0.053 af,	Atten= 0%, Lag= 0.4 min
Discarded =	0.01 cfs @	5.70 hrs, Volume=	0.014 af	
Primary =	0.74 cfs @	12.09 hrs, Volume=	0.039 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 95.67' @ 12.09 hrs Surf.Area= 340 sf Storage= 380 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 28.4 min (776.6 - 748.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.50'	289 cf	**8.50'W x 40.00'L x 2.54'H Field A** 864 cf Overall - 141 cf Embedded = 723 cf x 40.0% Voids
#2A	94.50'	141 cf	**Cultec C-100HD** x 10 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		431 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	95.50'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 5.70 hrs HW=93.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.74 cfs @ 12.09 hrs HW=95.67' TW=0.00' (Dynamic Tailwater)
↑—***2=Orifice/Grate*** *(Weir Controls 0.74 cfs @ 1.36 fps)*

Pond RECH1: Proposed Recharge System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 2 rows

36.0" Wide + 6.0" Spacing = 42.0" C-C Row Spacing

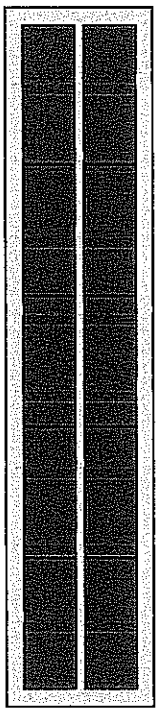
5 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 38.00' Row Length +12.0" End Stone x 2 = 40.00' Base Length
2 Rows x 36.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.50' Base Width
12.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.54' Field Height

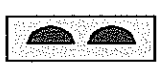
10 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 2 Rows = 141.5 cf Chamber Storage

864.2 cf Field - 141.5 cf Chambers = 722.7 cf Stone x 40.0% Voids = 289.1 cf Stone Storage

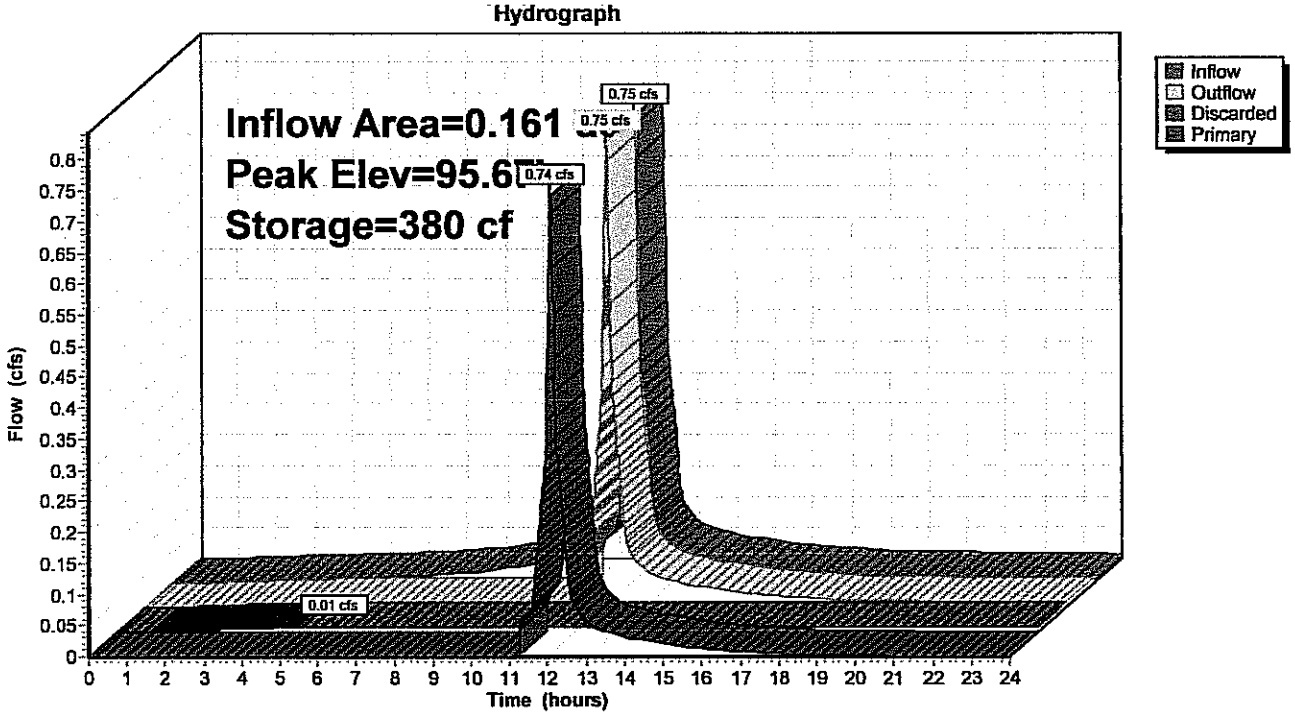
Chamber Storage + Stone Storage = 430.6 cf = 0.010 af
Overall Storage Efficiency = 49.8%

10 Chambers
32.0 cy Field
26.8 cy Stone





Pond RECH1: Proposed Recharge System



Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
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 POST-1: Post Development Runoff Area=7,000 sf 100.00% Impervious Runoff Depth>5.36"
Tc=6.0 min CN=98 Runoff=0.88 cfs 0.072 af

Subcatchment POST-2: Post Development Runoff Area=19,130 sf 46.52% Impervious Runoff Depth>5.13"
Tc=6.0 min CN=96 Runoff=2.37 cfs 0.188 af

Pond AP-1: Analysis Point 1 Inflow=3.22 cfs 0.237 af
Primary=3.22 cfs 0.237 af

Pond RECH1: Proposed Recharge System Peak Elev=95.71' Storage=385 cf Inflow=0.88 cfs 0.072 af
Discarded=0.01 cfs 0.015 af Primary=0.86 cfs 0.049 af Outflow=0.86 cfs 0.064 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.259 af Average Runoff Depth = 5.19"
39.15% Pervious = 0.235 ac 60.85% Impervious = 0.365 ac

Summary for Subcatchment POST-1: Post Development Area 1

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

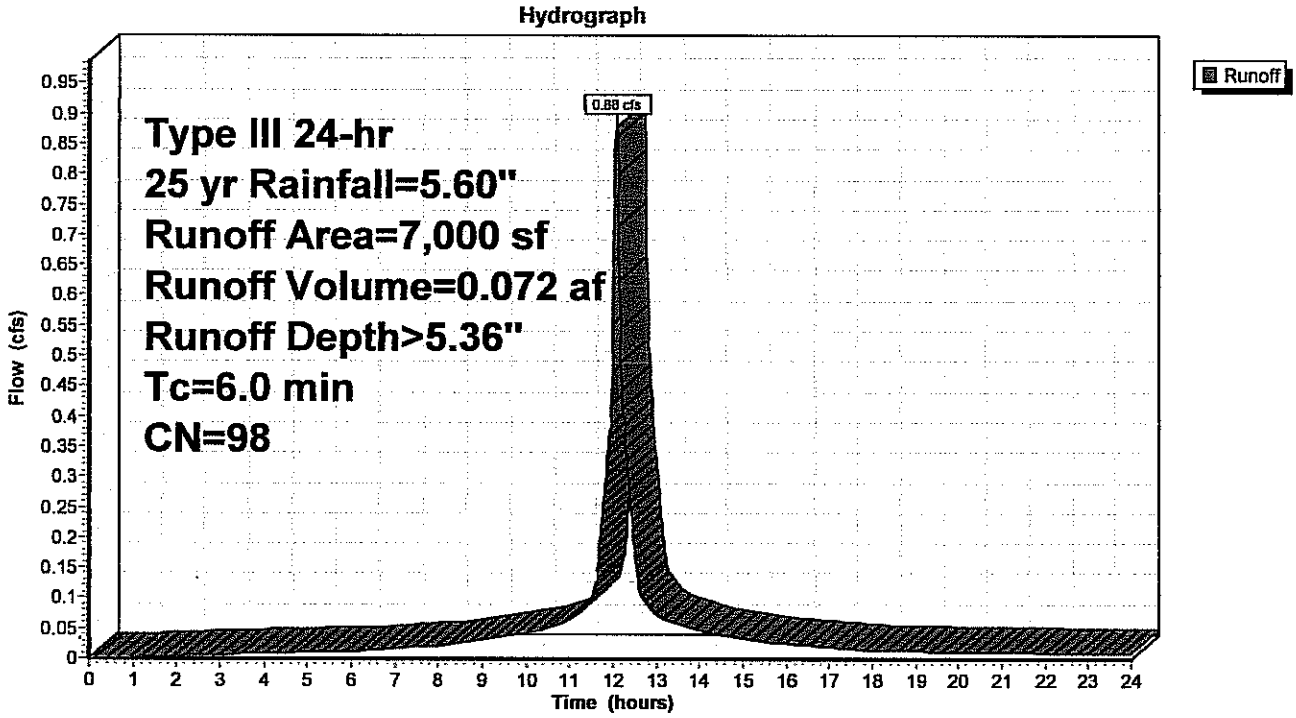
Runoff = 0.88 cfs @ 12.08 hrs, Volume= 0.072 af, Depth> 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr Rainfall=5.60"

Area (sf)	CN	Description
7,000	98	Paved parking & roofs
7,000		100.00% Impervious Area

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

Subcatchment POST-1: Post Development Area 1



Summary for Subcatchment POST-2: Post Development Area 2

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

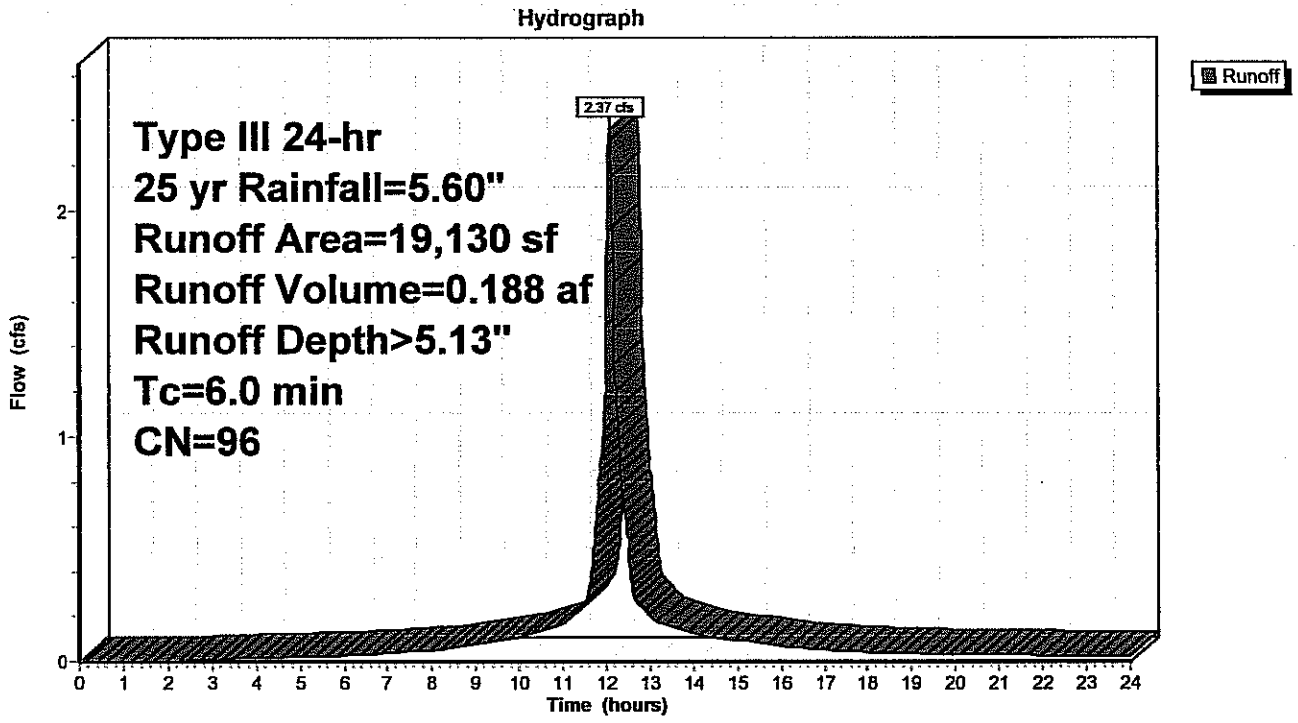
Runoff = 2.37 cfs @ 12.08 hrs, Volume= 0.188 af, Depth> 5.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 yr Rainfall=5.60"

Area (sf)	CN	Description
8,900	98	Paved parking & roofs
9,530	96	Gravel surface, HSG C
700	74	>75% Grass cover, Good, HSG C
19,130	96	Weighted Average
10,230		53.48% Pervious Area
8,900		46.52% Impervious Area

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

Subcatchment POST-2: Post Development Area 2



Summary for Pond AP-1: Analysis Point 1

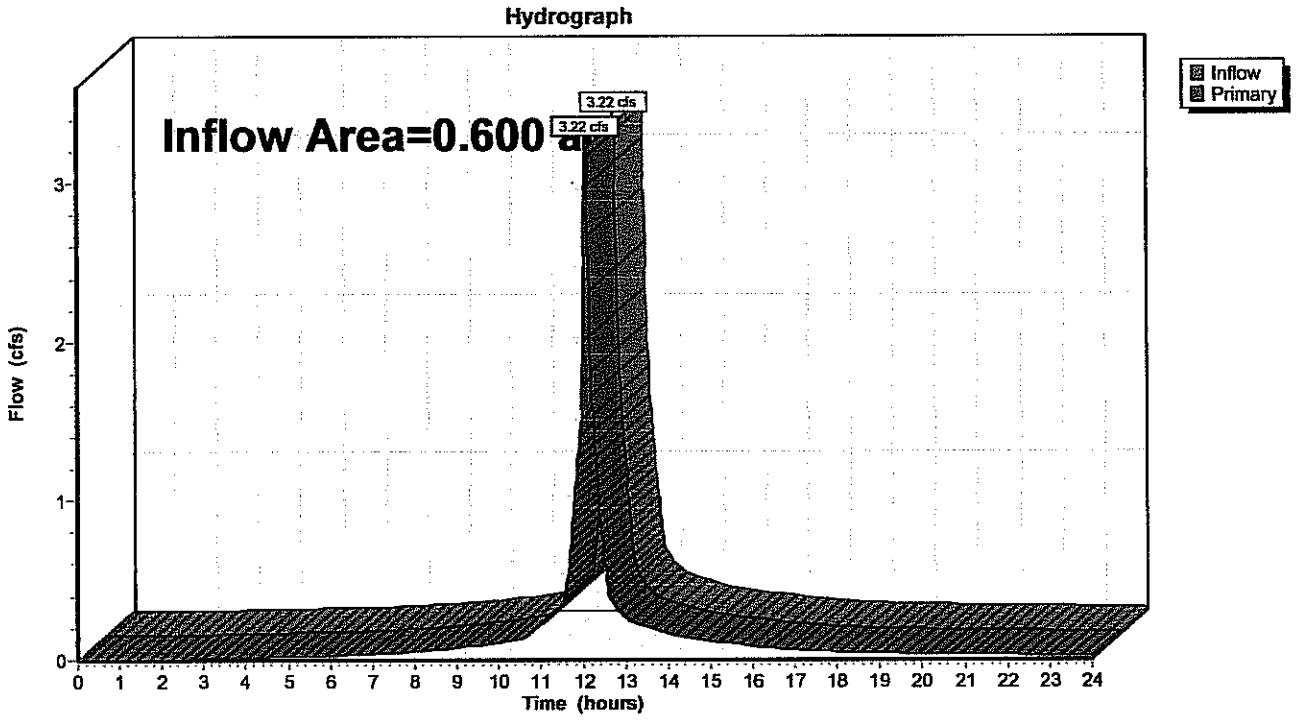
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area =	0.600 ac,	60.85% Impervious,	Inflow Depth >	4.73"	for 25 yr event
Inflow =	3.22 cfs @	12.09 hrs,	Volume=	0.237 af	
Primary =	3.22 cfs @	12.09 hrs,	Volume=	0.237 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Pond AP-1: Analysis Point 1



Summary for Pond RECH1: Proposed Recharge System

Inflow Area = 0.161 ac,100.00% Impervious, Inflow Depth > 5.36" for 25 yr event
Inflow = 0.88 cfs @ 12.08 hrs, Volume= 0.072 af
Outflow = 0.86 cfs @ 12.10 hrs, Volume= 0.064 af, Atten= 2%, Lag= 0.8 min
Discarded = 0.01 cfs @ 4.70 hrs, Volume= 0.015 af
Primary = 0.86 cfs @ 12.10 hrs, Volume= 0.049 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 95.71' @ 12.10 hrs Surf.Area= 340 sf Storage= 385 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 27.7 min (773.4 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.50'	289 cf	**8.50'W x 40.00'L x 2.54'H Field A** 864 cf Overall - 141 cf Embedded = 723 cf x 40.0% Voids
#2A	94.50'	141 cf	**Cultec C-100HD** x 10 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		431 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	95.50'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 4.70 hrs HW=93.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.85 cfs @ 12.10 hrs HW=95.70' TW=0.00' (Dynamic Tailwater)
↑—**2=Orifice/Grate** (Orifice Controls 0.85 cfs @ 2.18 fps)

Pond RECH1: Proposed Recharge System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 2 rows

36.0" Wide + 6.0" Spacing = 42.0" C-C Row Spacing

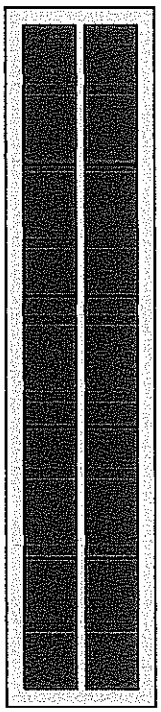
5 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 38.00' Row Length +12.0" End Stone x 2 = 40.00' Base Length
2 Rows x 36.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.50' Base Width
12.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.54' Field Height

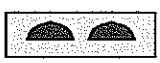
10 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 2 Rows = 141.5 cf Chamber Storage

864.2 cf Field - 141.5 cf Chambers = 722.7 cf Stone x 40.0% Voids = 289.1 cf Stone Storage

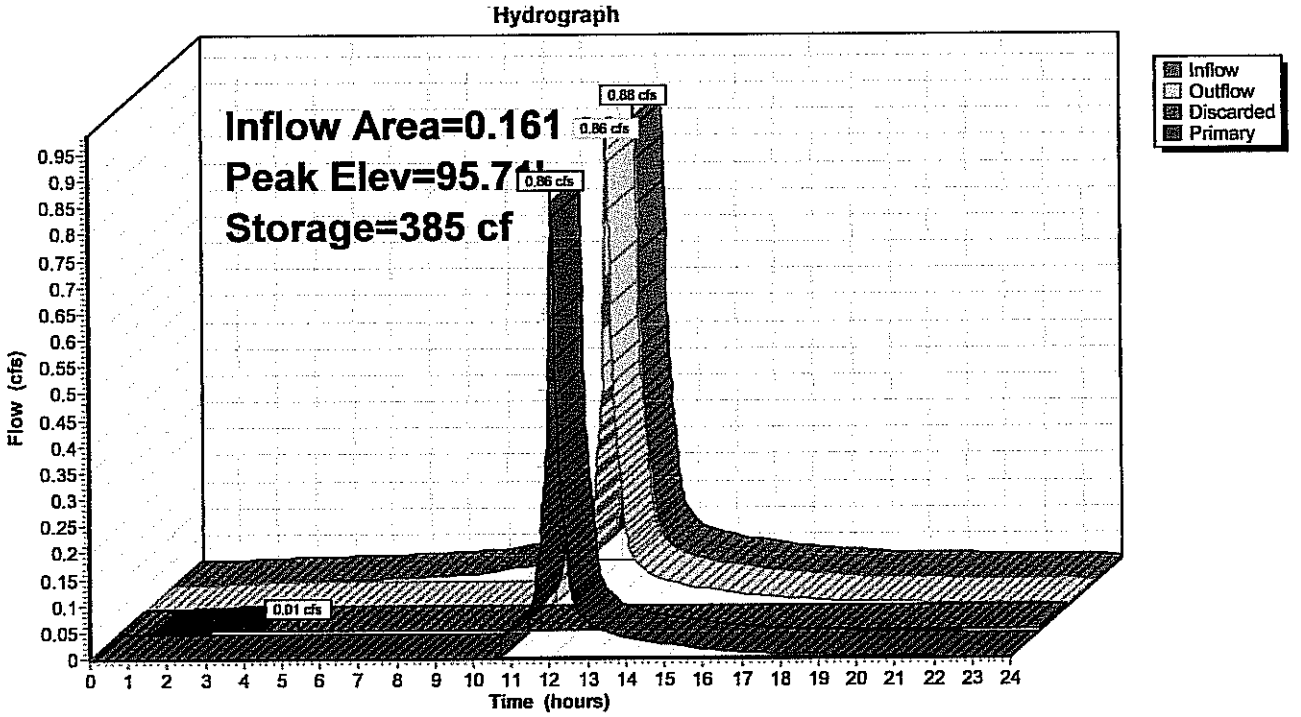
Chamber Storage + Stone Storage = 430.6 cf = 0.010 af
Overall Storage Efficiency = 49.8%

10 Chambers
32.0 cy Field
26.8 cy Stone





Pond RECH1: Proposed Recharge System



Time span=0.00-24.00 hrs, dt=0.02 hrs, 1201 points x 2
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 POST-1: Post Development Runoff Area=7,000 sf 100.00% Impervious Runoff Depth>6.76"
Tc=6.0 min CN=98 Runoff=1.10 cfs 0.090 af

Subcatchment POST-2: Post Development Runoff Area=19,130 sf 46.52% Impervious Runoff Depth>6.52"
Tc=6.0 min CN=96 Runoff=2.98 cfs 0.239 af

Pond AP-1: Analysis Point 1 Inflow=4.03 cfs 0.306 af
Primary=4.03 cfs 0.306 af

Pond RECH1: Proposed Recharge System Peak Elev=95.82' Storage=400 cf Inflow=1.10 cfs 0.090 af
Discarded=0.01 cfs 0.015 af Primary=1.06 cfs 0.067 af Outflow=1.07 cfs 0.082 af

Total Runoff Area = 0.600 ac Runoff Volume = 0.329 af Average Runoff Depth = 6.58"
39.15% Pervious = 0.235 ac 60.85% Impervious = 0.365 ac

Summary for Subcatchment POST-1: Post Development Area 1

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

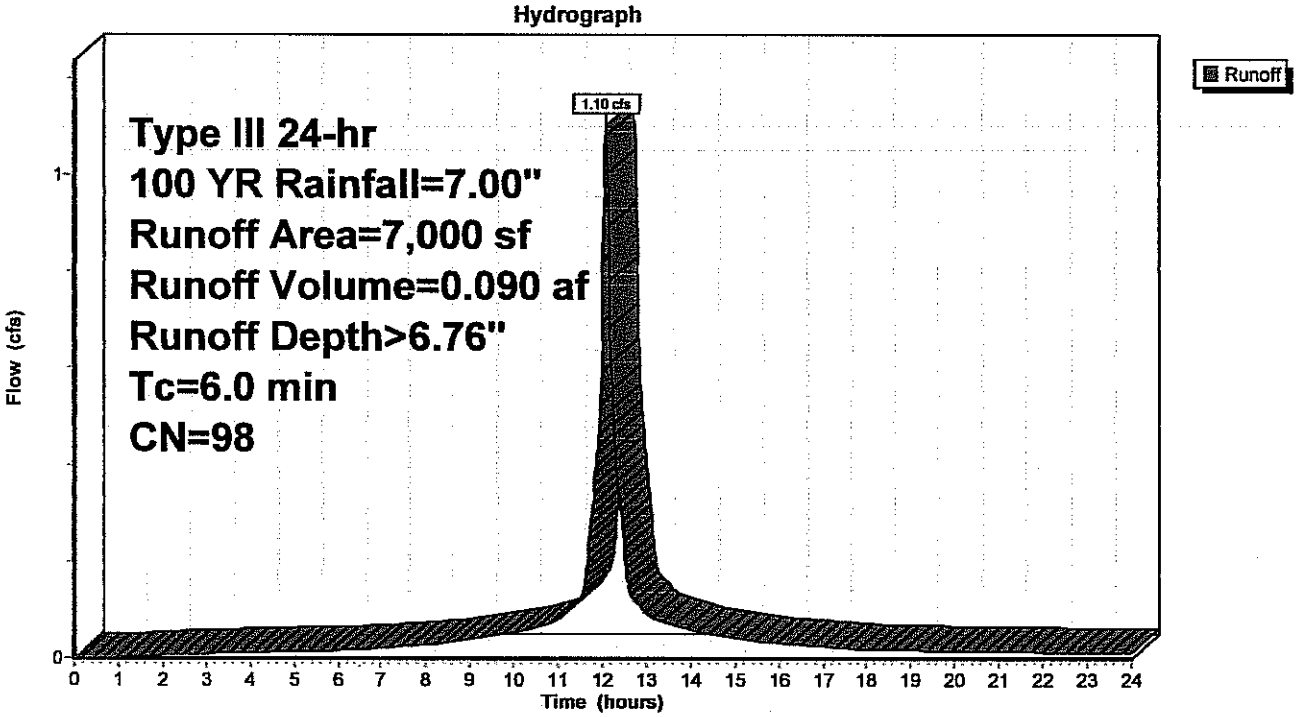
Runoff = 1.10 cfs @ 12.08 hrs, Volume= 0.090 af, Depth> 6.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
7,000	98	Paved parking & roofs
7,000		100.00% Impervious Area

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

Subcatchment POST-1: Post Development Area 1



Summary for Subcatchment POST-2: Post Development Area 2

Post Development Area 2 consists of the remaining areas of the site that will continue to flow unattenuated to off-site drainage systems.

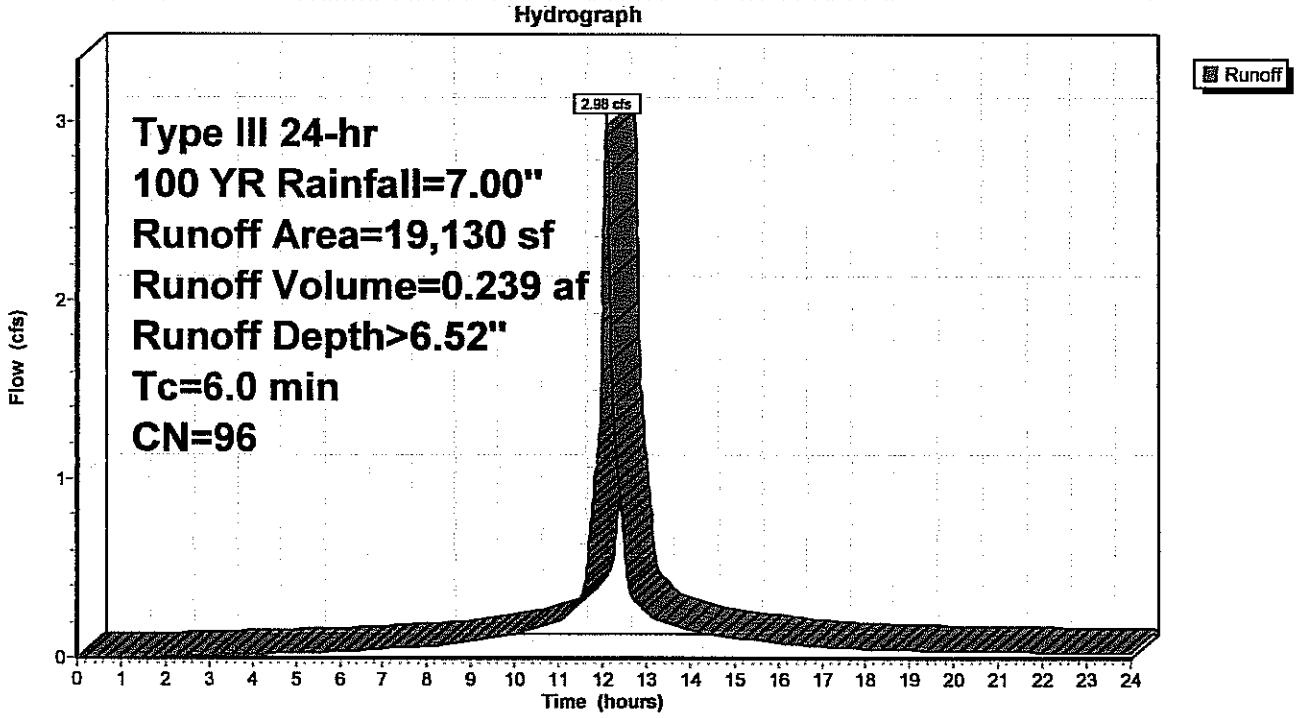
Runoff = 2.98 cfs @ 12.08 hrs, Volume= 0.239 af, Depth> 6.52"

Runoff by SCS TR-20 method; UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs
Type III 24-hr 100 YR Rainfall=7.00"

Area (sf)	CN	Description
8,900	98	Paved parking & roofs
9,530	96	Gravel surface, HSG C
700	74	>75% Grass cover, Good, HSG C
19,130	96	Weighted Average
10,230		53.48% Pervious Area
8,900		46.52% Impervious Area

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

Subcatchment POST-2: Post Development Area 2



Summary for Pond AP-1: Analysis Point 1

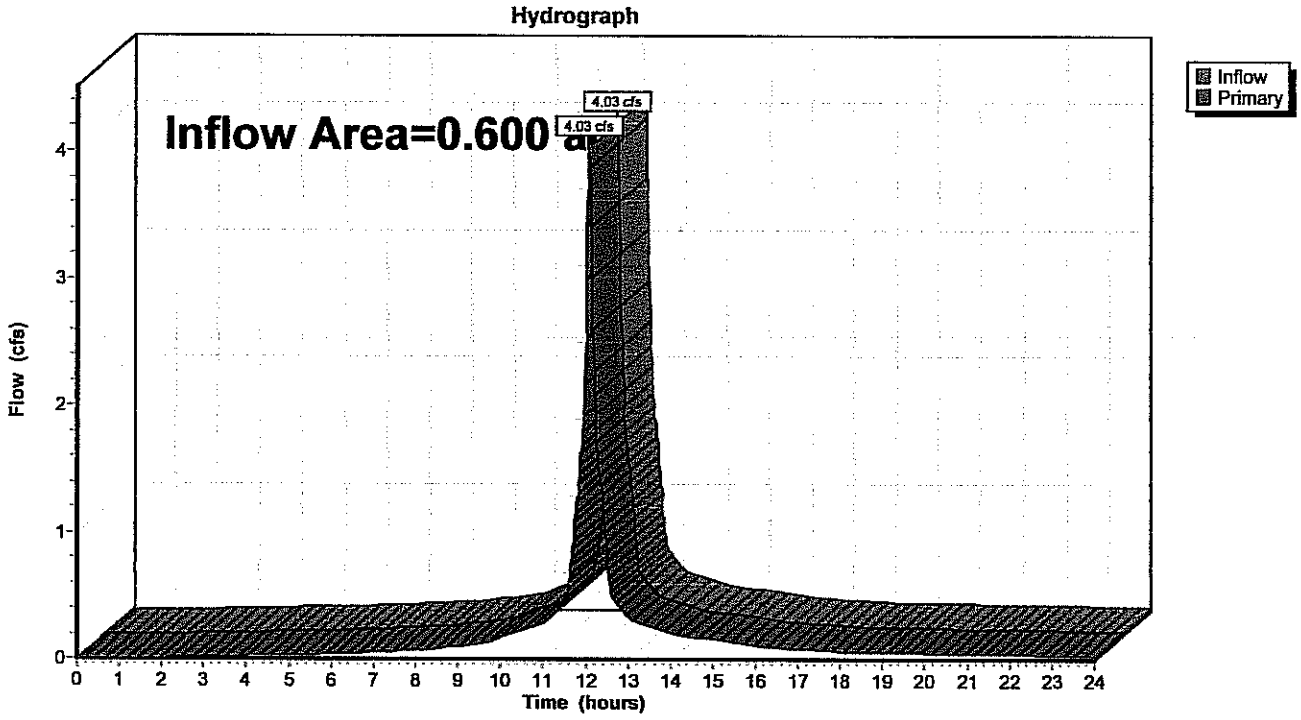
Analysis Point 1 is taken as the off-site drainage systems to which the site currently flows to unattenuated.

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

Inflow Area =	0.600 ac,	60.85% Impervious,	Inflow Depth >	6.12" for 100 YR event
Inflow =	4.03 cfs @	12.09 hrs, Volume=	0.306 af	
Primary =	4.03 cfs @	12.09 hrs, Volume=	0.306 af,	Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2

Pond AP-1: Analysis Point 1



Summary for Pond RECH1: Proposed Recharge System

Inflow Area = 0.161 ac,100.00% Impervious, Inflow Depth > 6.76" for 100 YR event
Inflow = 1.10 cfs @ 12.08 hrs, Volume= 0.090 af
Outflow = 1.07 cfs @ 12.10 hrs, Volume= 0.082 af, Atten= 3%, Lag= 1.2 min
Discarded = 0.01 cfs @ 3.50 hrs, Volume= 0.015 af
Primary = 1.06 cfs @ 12.10 hrs, Volume= 0.067 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.02 hrs / 2
Peak Elev= 95.82' @ 12.10 hrs Surf.Area= 340 sf Storage= 400 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 27.4 min (769.9 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	93.50'	289 cf	**8.50'W x 40.00'L x 2.54'H Field A** 864 cf Overall - 141 cf Embedded = 723 cf x 40.0% Voids
#2A	94.50'	141 cf	**Cultec C-100HD** x 10 Inside #1 Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap Row Length Adjustment= +0.50' x 1.86 sf x 2 rows
		431 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	93.50'	**1.020 in/hr Exfiltration over Surface area**
#2	Primary	95.50'	**6.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.01 cfs @ 3.50 hrs HW=93.53' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.06 cfs @ 12.10 hrs HW=95.81' TW=0.00' (Dynamic Tailwater)
↑—***2=Orifice/Grate*** *(Orifice Controls 1.06 cfs @ 2.70 fps)*

Pond RECH1: Proposed Recharge System - Chamber Wizard Field A

Chamber Model = Cultec C-100HD (Cultec Contactor® 100HD)
Effective Size= 32.1"W x 12.0"H => 1.86 sf x 7.50'L = 14.0 cf
Overall Size= 36.0"W x 12.5"H x 8.00'L with 0.50' Overlap
Row Length Adjustment= +0.50' x 1.86 sf x 2 rows

36.0" Wide + 6.0" Spacing = 42.0" C-C Row Spacing

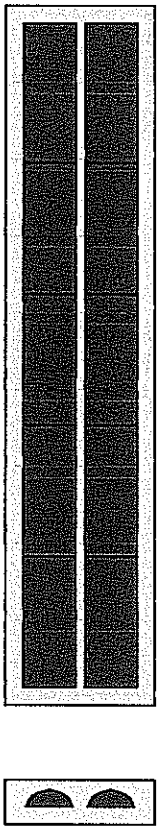
5 Chambers/Row x 7.50' Long +0.50' Row Adjustment = 38.00' Row Length +12.0" End Stone x 2 = 40.00' Base Length
2 Rows x 36.0" Wide + 6.0" Spacing x 1 + 12.0" Side Stone x 2 = 8.50' Base Width
12.0" Base + 12.5" Chamber Height + 6.0" Cover = 2.54' Field Height

10 Chambers x 14.0 cf +0.50' Row Adjustment x 1.86 sf x 2 Rows = 141.5 cf Chamber Storage

864.2 cf Field - 141.5 cf Chambers = 722.7 cf Stone x 40.0% Voids = 289.1 cf Stone Storage

Chamber Storage + Stone Storage = 430.6 cf = 0.010 af
Overall Storage Efficiency = 49.8%

10 Chambers
32.0 cy Field
26.8 cy Stone



Section 4

Supplemental Data

FIELD ENGINEERING, INC. MATTAPOISETT, MA

RECHARGE VOLUME CALCULATION

Client:	HATHAWAY COLLISION CENTER	Job No.	2097
Project:	167 POTTER STREET	Date:	8/11/2016
Location:	NEW BEDFORD MA	Design by:	R. RICCIO

REQUIRED RECHARGE VOLUME - ROOF DRAIN RECHARGE SYSTEM (CALCULATED BY THE STATIC METHOD)

HYDROLOGIC SOIL GROUP	C
UNIT VOLUME (in.) =	0.25
IMPERVIOUS AREA (s.f.) =	15,000
RECHARGE VOLUME (cu.ft.) =	313

AVAILABLE VOLUME CALCULATION

312 CF OF STORAGE PROVIDED WITHIN THE ROOF DRAIN RECHARGE SYSTEM (BASED ON HYDROCAD CALCULATIONS-SEE ATTACHED SHEET)

DRAWDOWN TIME CALCULATION

DRAWDOWN TIME=(REQ.RECH. VOL.)/(DES. INFILTRATION RATE "K"*BOTTOM AREA)

RECHARGE VOLUME PROVIDED (CF)=	352.0	
DESIGN INFILTRATION RATE (IN/HR)=	1.0	
BOTTOM AREA(SF)=	333.0	
DRAWDOWN TIME (HRS)=	12.4	OK

Soil Map—Bristol County, Massachusetts, Southern Part
(167 Potter St)

Map Scale: 1:608 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 25 50 100 150

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 9, Sep 28, 2015

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

Date(s) aerial images were photographed: Mar 30, 2011—Oct 8, 2011

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

Map Unit Legend

Bristol County, Massachusetts, Southern Part (MA603)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
602	Urban land	0.8	100.0%
Totals for Area of Interest		*0.8*	*100.0%*

Appendix A

Pre and Post Development Watershed Sketches

Appendix B

Long Term Pollution Prevention Plan

Long Term Pollution Prevention Plan
Proposed Site Development
Hathaway Collision Center
167 Potter Street
New Bedford, Massachusetts

1.0 Introduction

This Long Term Pollution Prevention Plan has been prepared in accordance with the Massachusetts Stormwater Handbook for Compliance with Stormwater Standards 4-6.

2.0 Good Housekeeping Practices/Storage Provisions

Good housekeeping practices including periodic inspections of stormwater management system components will be performed in accordance with the Stormwater Management System Operation and Maintenance Plan. It is not anticipated that any high pollutant materials would be stored on site in areas that would discharge directly any wetland resource areas or drainage system. It would be anticipated that maintenance personnel would make routine periodic inspections of the facility to ensure there are no issues with any materials stored on-site.

3.0 Vehicle Washing Controls

It is not anticipated that any vehicle washing would be taking place on site. The proposed use is an auto-body repair facility and significant vehicle washing will not take place.

4.0 Routine Maintenance of Stormwater BMP's

The Stormwater BMP's including the proposed roof drain recharge system and proposed edge drain will all be operated and maintained in accordance with the Stormwater Management System Operation and Maintenance Plan which is discussed on the Site Development Plans.

5.0 Spill Prevention and Response Plans

Emergency contact numbers will be posted through the facility that may occupy the building with a 24-hour contact number in the event of any spills on-site.

6.0 Landscaping Provisions

Landscaping on-site will consist strictly of loam and seeded areas. It is anticipated that the grassed areas will be mowed once or twice annually. Disposal of lawn and garden waste will be prohibited from any areas being used for stormwater management as well as in the wetland resource areas. Additionally, provisions shall be made to minimize the amount of fertilizers and other materials that will be allowed to be discharged within the landscaped areas on the site.

7.0 Pet Waste Management Provisions

It is not anticipated that there would be any pets on site at the existing auto repair facility.

8.0 Provisions for Solid Waste Management

Solid waste will be managed with existing trash containers and dumpsters located on-site.

9.0 Snow Disposal Guidelines

Plowing directly into the wetland resource areas or buffer zones will not be permitted. All snow stored on site will melt and flow through the stormwater management system.

10.0 Winter Road Salt and Sand Use

The use of road salt will not be allowed on the site. Sand will be used wherever possible. In is not anticipated that large quantities of road salt and/or sand will be stored on site.

11.0 Illicit Discharge Prevention

Illicit connections to the stormwater management system will be strictly prohibited. Any contractors performing work at the site will be notified of the prohibition of any illicit connections to the stormwater management system. All work done on site shall be per the approved design plans.

12.0 Training for Staff

The owners of the building will be required to operate and maintain the Stormwater Management System. Any Site Management Staff would be properly trained in the operation and maintenance of the Stormwater Management System.

13.0 Emergency Contacts

The applicants for the project, Hathaway Collision Center, would be the emergency contacts for any implementation measures that may be required on this Long-Term Pollution Prevention Plan. Emergency contact numbers are posted throughout the site and facilities should any emergency situations arise.

Appendix C

Illicit Discharge Compliance Statement

Illicit Discharge Compliance Statement
Proposed Site Development
Hathaway Collision Center
167 Potter Street
New Bedford, Massachusetts

1.0 Description of Illicit Discharges

Illicit discharges are discharges to the stormwater management system that are not entirely composed of stormwater. Illicit discharges include (but are not limited to) wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

2.0 Illicit Discharge Prevention

The project, as designed, does not provide for any illicit connections to the proposed stormwater management system. As part of the long-term pollution prevention plan that will be on file at the Town and with the Owners, illicit connections to the stormwater management system will be strictly prohibited. Any contractors performing work at the site will be notified of the prohibition of any illicit connections to the stormwater management system.

3.0 Training for Staff

The property owner/managers responsible for the maintenance of the stormwater management system will be properly trained as required to detect any unauthorized illicit discharges to the stormwater management system and eliminate them as soon as possible. It is anticipated that staff will be performing routine maintenance on the stormwater management system and at this time would be able to detect any unauthorized illicit discharges.

4.0 Site Map

Refer to Proposed Site Development Plans prepared for Hathaway Collision Center by Field Engineering for locations and information on the proposed stormwater management system associated with this project.

5.0 Certification

As the design plans show, there are no provisions for illicit discharges to the stormwater management system being proposed. Additionally, there are no proposed connections between any stormwater and wastewater management systems. Illicit discharges will be prohibited to the new stormwater management system associated with the proposed project and the property owners have been notified to not allow any unauthorized illicit discharges.

Richard R. Riccio III, P.E.