# Stormwater Management System Report

# RAW SEAFOODS INC.

## PROPOSED COLD STORAGE FACILITY

## SAMUEL BARNET BOULEVARD
## NEW BEDFORD, MASSACHUSETTS

Prepared for:

Raw Seafoods, Inc.
481 Currant Road
Fall River, MA 02720

Prepared by:

Field Engineering Co., Inc.
11D Industrial Drive
PO Box 1178
Mattapoisett, Massachusetts 02739

October 8, 2015
Project No. 2064

FIELD ENGINEERING CO., INC.
CONSULTING ENGINEERS

# *Preface*

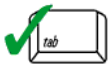
## *Stormwater Management Standards Compliance Checklist*

**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.

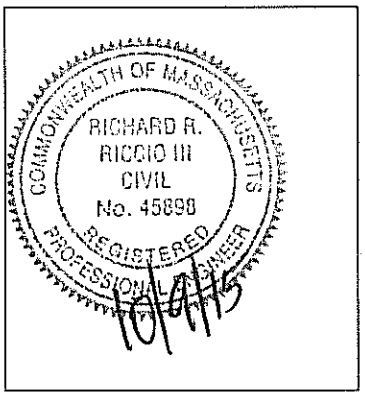
*Note:* Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that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




10/9/15

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): Proprietary Water Quality Units/Infiltration Basin

**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.

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# *Section 1*

## *Hydrologic Overview*

## 1.0 INTRODUCTION

### 1.1 Project Description

The applicant is proposing to construct an approximate 92,000 square foot cold storage building with on a vacant parcel of land located on Samuel Barnet Boulevard in the New Bedford Business Park. The project will consist of construction of the building, proposed parking and loading areas, associated stormwater management facilities and utilities, and the construction of a proposed rail spur off the adjacent rail line to service the facility. The applicants are proposing construction of this building to expand their existing operations currently located in Fall River, MA and the site would provide convenient rail access to support their business. The facility will be services by an on-site stormwater management system and will tie into existing sewer and water utilities currently available in Samuel Barnet Boulevard.

The majority of the new paved surfaces on the site will be serviced by an on-site stormwater management system consisting of a combination a closed conduit drainage system, sediment forebays and detention/infiltration systems. A small portion of the new paved surface will be treated for water quality via an proprietary water quality unit prior to discharge to the existing culverts under Samuel Barnet Boulevard that currently drain the site. The roof drainage will be directed to the large detention/infiltration system to be constructed in front of the proposed building. It should be noted that this basin has been sized to accommodate the potential future expansion of the building as shown on the Proposed Site Development Plans.

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 new 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 the bio-retention areas and extended detention/infiltration basins being proposed through the site

In the present condition, the site supports a wetland resource area as defined in the Wetlands Protection Act and 310 CMR 10.00 surrounding the property on three sides. The majority of these resource areas has been reviewed and approved by the Conservation Commission and the Department of Environmental Protection under an Order of Resource Area.

The specific resource areas specific to the subject parcel are as follows:

- Bordering Vegetated Wetland
- Perennial Stream

### 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 development to the adjacent properties, roadway drainage systems, and on-site wetland resource areas. Particular consideration has been given to stormwater quantity and quality at the existing bordering vegetated wetland system which surrounds the property and currently discharges via the perennial stream to twin 36” corrugated metal culverts under Samuel Barnet Boulevard on the southwestern side of the site. The wetland system surrounding the site and ultimate discharge to Samuel Barnet Boulevard is taken as the sole Analysis Point for this analysis.

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 of the pre-developed condition consists of two (2) watershed areas with one analysis point as described above. The hydrologic study area in the post-developed condition consists of three (3) watershed areas with the same analysis point corresponding to the pre development model. The pre and post development watershed areas and corresponding analysis points are described in the following sections and shown on the Watershed Plans submitted in Appendices A and B, respectively.

The Bristol County Soil Conservation Service (SCS) mapping for this area indicates a number of different soil types ranging from Scarboro Muck to Urban Land. The predominant soil classifications are as follows:

- Pipestone Loamy Sands (38A), 0 to 3 percent slopes – Hydrologic Soil Group A/D
- Sudbury fine sandy loam (260A), 0 to 3 percent slopes – Hydrologic Soil Group B
- Freetown Muck (52A), 0 to 1 percent slopes – Hydrologic Soil Group D

### 1.3 Pre-Development Hydrologic Summary

In the present condition, the site is comprised of two (2) watershed areas as shown on the attached Pre Development Watershed Plan. The watershed designations and corresponding analysis points are as follows:

- Subcatchment PRE 1 is a 9.1 acre portion of the overall watershed area consisting of the areas of the site which currently flow unattenuated towards the bordering vegetated wetland system surrounding the site which discharges via a stream to a pair of 36" corrugated metal pipes under Samuel Barnet Boulevard, which are being considered as Analysis Point 1 (AP-1) in the Pre Development Hydrologic Analysis.

- Subcatchment PRE 2 is a 1.4-acre portion of the overall watershed area consisting of a portion of the site that currently flows to an existing depression prior to overtopping and flowing towards Analysis Point 1.

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 | 0.85 |
| 10-year storm | 3.69 |
| 25-year storm | 6.23 |
| 100-year storm | 11.56 |

**1.4 Post Development Hydrologic Summary**

In the developed condition, the site is comprised of three (3) 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 points. The watershed designations and corresponding analysis point for each of the post development watersheds are as follows:

- Subcatchment POST 1 is a 4.9 acre portion of the overall watershed area consisting of the areas of the site including the proposed building (and future addition) a portion of the site driveway and landscaped areas around the building which will flow to through a closed conduit drainage system to a sediment forebay ahead of an extended detention/infiltration basin (POND 1) which will discharge runoff at a controlled rate to the easterly wetlands, taken as Analysis Point 1 (AP-1) in the Post Development Hydrologic Analysis.

- Subcatchment POST 2 is a 0.9 acre portion of the overall watershed area consisting of the rear parking area, a portion of the site driveway and the landscaping areas which will flow via a closed conduit drainage system to a proposed sediment forebay and extended detention basin which will also discharge runoff at a controlled rate, ultimately to Analysis Point 1.

- Subcatchment POST 3 is a 4.7-acre portion of the overall watershed area consisting of the unattenuated areas of the site which will continue to flow towards the surrounding wetland system contributing runoff to Analysis Point 1.

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 | 0.74 |
| 10-year storm | 2.73 |
| 25-year storm | 4.44 |
| 100-year storm | 7.94 |

A summary of the pre and post-development hydrologic conditions for the 2, 10, 25, and 100-year storm events is submitted in Table 1.5 below. Results shown as a "negative" represent a decrease in post development condition rates of runoff.

Table 1.5 – Pre-Post Development Hydrologic Results

| Storm Event | Analysis Point AP-1 Rate of Flow |
|---|---|
| 2-year storm | -12.9% |
| 10-year storm | -26.0% |
| 25-year storm | -28.7% |
| 100-year storm | -31.3% |

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 subject analysis point. The analysis shows the proposed development of this project area will not result in an increase in the rates of runoff from the project site.

### 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. The goal of the proposed stormwater management system design was to provide the necessary water quality treatment and attenuation for all of the runoff generated in proposed conditions. The stormwater management system makes use of a variety of stormwater Best Management Practices (BMP's) to meet this objective. These BMP's are described in more detail in the follow section.

Runoff from the majority of the site will flow through sediment forebays and extended detention/infiltration systems with culvert outfalls and overflow riprap spillways which will serve to reduce the rates of runoff to the subject analysis point. A portion of the paved surface will discharge to a proprietary water quality inlet for pre-treatment prior to discharge to the analysis point. The predicted Total Suspended Solids (TSS) Removal and Water Quality calculations for these areas are submitted in Section 4. Calculations have been provided to show that the proposed stormwater management system will provide more than adequate water quality volumes and capabilities to handle the proposed paved and impervious areas on the developed portions of the lot, prior to discharge to either the easterly wetlands or roadway drainage system.

### 1.6 Select Structural Best Management Practices (BMP's)

**Hooded Catch Basins with Deep Sumps**

Stormwater from portions of the paved parking and driveway areas will be collected in a closed conduit piping system fitted with 4-foot deep sump catch basins with hooded outlets. Catch basin sump systems are effective devices for removal of large matter and pollutants that adsorb to sediments and other particulates. Catch basins with sumps and hooded outlets are designed to trap sediment particles and floating contaminants (e.g., oil and greases), that are typically the most significant constituents of the urban runoff pollutant load. Regular maintenance and cleaning of catch basins is required to assure adequate performance of these structures. A specific maintenance schedule is submitted in this document and on the plans.

**Water Quality Inlets**

A water quality inlet or oil/water separator will be implemented at the stormwater management system for the subcatchment area consisting of the paved loading area which is too low elevation-wise to drain to a conventional stormwater management basin. The water quality inlet will consist of a Stormceptor Water Quality Inlet as manufactured by CSR Hydro Conduit or approved equal. The Stormceptor provides velocity dissipation and a settling zone to capture water borne sediment and floating oils. The predicted Total Suspended Solids (TSS) removal rate for the specified model is based on the Environmental Protection Agency (EPA) SWMM model calculations submitted in Section 4. The contractor will be required to provide shop drawings and documentation that any alternative units will provide equal treatment and performance to the Stormceptor model proposed on the design drawings.

**Extended Detention/Infiltration Basins with Sediment Forebay**

Runoff from portions of the existing (and proposed) paved parking and paved material storage areas will be conveyed to a sediment forebay in advance a new extended detention/infiltration basin wetland system. The forebays are designed to accept a minimum 0.10 inch per contributing acre of watershed area and are approximately 2.0 feet deep. The extended detention basins have been designed with sediment traps to extend the detention time of runoff within the basins and to enhance sediment deposition. Water quality treatment will be provided by capturing the required water quality volume (0.5 inch of runoff over the contributing paved area) within the bottom area of the basin (below the lowest outfall), trapping particulates and allowing treated stormwater to settle and slowly infiltration into the ground. The detention stage of the basin will serve to attenuate flow rates and, through extended detention time,

provide for additional treatment and pollutant removal. Dead storage volume below the lowest outfall from the basin will provide the necessary recharge volumes for the site. Storage volume above the outfall culvert will provide attenuation of the runoff for larger storm events.

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

**Pavement Sweeping Program**

All paved surfaces will be swept twice annually (fall and spring). The sweeping program will remove contaminants directly from the paved surfaces before their release into the stormwater runoff. The U.S. Environmental Protection Agency has determined that pavement sweeping can be an effective initial treatment for reducing pollutant loading into stormwater runoff.

**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 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. The Stormwater Management System Compliance Certification and Checklist has been included as the Preface to this Report.

**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 the paved surfaces and parking areas will be collected and treated by a closed conduit pipe system consisting of one or a series of structural BMPs including deep sump/hooded catch basins, proprietary water quality unit, sediment forebays, and extended detention/infiltration basins. Riprap pads and level spreader spillways have been installed at the point of discharge of all drainage outfalls to eliminate potential erosive flow velocities and dissipate the energy of the discharged stormwater, thereby avoiding sedimentation to the downgradient areas.

**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 extended detention/infiltration basins 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 via the substantial extended detention/infiltration basins being proposed on 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.**

- The 80 percent TSS removal rate will be achieved will the implementation of a street sweeping program, deep sump/hooded catch basins, and/or extended detention/infiltration basins. In addition, one area will flow through a proprietary water quality inlet for proposed pretreatment prior to discharge to the subject analysis point. The aggregate total of both structural and non-structural BMPs will meet or exceed the target 80% removal rate. Detailed TSS removal calculations are submitted in Section 4. Pavement sweeping has also been incorporated into the Operation and Maintenance Plan shown on the plans and will be a requirement of the approval.

**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.**

- No portion of the proposed project would be considered a land 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 within a Critical Area as defined in the Stormwater Management Standards.

**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.**

- No portion of the project would be considered a redevelopment project in accordance with the Stormwater Management Standards.

**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/silt fence barriers, and slope stabilization measures such as hay/straw blankets and jute matting. The proponent will complete a Stormwater Pollution Prevention Plan prior to construction in accordance with the NPDES General Permit for Stormwater Discharges associated with Construction Projects and this SWPPP will also be used as the plan to meet this standard.

**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 following sections.

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

- An Illicit Discharge Compliance Statement will be completed prior to construction and submitted with the final SWPPP to the Conservation Commission office.

## 1.8 Post Construction Operation and Maintenance Plan

Name and current address of the Applicant

Raw Seafoods Inc
487 Currrant Road
Fall River, Massachusetts 02720

Name and address of the Contractor of Record

To be determined and provided to Conservation Commission upon selection.

Plans of Record

Refer to Site Development Plans prepared for Raw Seafoods Inc. by Field Engineering and last dated 10/8/15 for locations of all BMP's on site as well as construction details of all BMP's. Refer to the Order of Conditions to be issued by the New Bedford Conservation Commission for additional information regarding the operation and maintenance of the stormwater management BMP's on site.

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 catch basins, and subsurface infiltration systems 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 |
|---|---|
| Deep Sump Catch Basins | 4 |
| Extended Detention/Infiltration Basins | 2 |
| Wet Basins | |
| Water Quality Inlets | Per Manufacturer's Specifcations |

4. The owner shall maintain and submit to the Conservation Commission upon request a BMP Inspection Report following each site inspection as recommended above. The BMP Inspection report shall identify the Date of Inspection, the name and contact number of the responsible party, specific structures inspected, specific maintenance required and observations at a minimum, inspection reports should address the following conditions where applicable:
    1. Embankment Subsidence
    2. Erosion
    3. Cracking of Containment Berm
    4. Inlet/Outlet Conditions
    5. Sediment Accumulations
    6. Slope Stability

5. Accumulated silt and sediment should be removed four times a year for sediment forebays and grassed swale or more frequently if accumulated depth of sediment exceeds six inches at the proposed stone check dams. Accumulated silt and sediment should be removed at least once a year for deep sump catch basins or more frequently if accumulated depth of sediment exceeds six inches.

6. All removed sediments are to be properly disposed of at a location to be approved by the Board of Health. Transportation and disposal of sediments shall comply with all applicable local, state, and federal regulations.

7. The driveway and parking areas shall be swept at least twice per year.

8. The extended detention/infiltration basins, sediment forebays and all landscaped areas should be inspected for trash on a monthly basis. Any accumulated trash, litter and discarded materials shall be removed.

9. Snow will be stockpiled within and around areas which drain into the stormwater management system wherever practicable. Catch basin grates will be cleaned of snow and ice after all snowfall events. The discharge of snow directly into the wetland resource areas will be prohibited.

10. No disposal of materials will be permitted within the any of the stormwater management system BMP's. This prohibition applies to trash, fill material, construction debris, grass clippings, collected leaves, and cut branches.

11. The embankments, side slopes, and bottom areas of the extended detention/infiltration basins and sediment forebay areas shall be mowed at least twice annually to facilitate maintenance of the basins.

12. An Operation and Maintenance Inspection Form shall be developed and copies of the completed forms shall be compiled by the Owner. These forms shall be available for review by the Conservation Commission upon request.

13. The Owner shall contract with a maintenance company on an annual basis that will be responsible for the operation and maintenance of the stormwater management system. The contact information for this company shall be provided to the Conservation Commission for their files.

14. The storm water BMP's will be inspected annually during regularly scheduled mid-summer landscaping and weeding operations for invasive or unwanted plants. If invasive species are found, they will be physically uprooted and removed from the area.

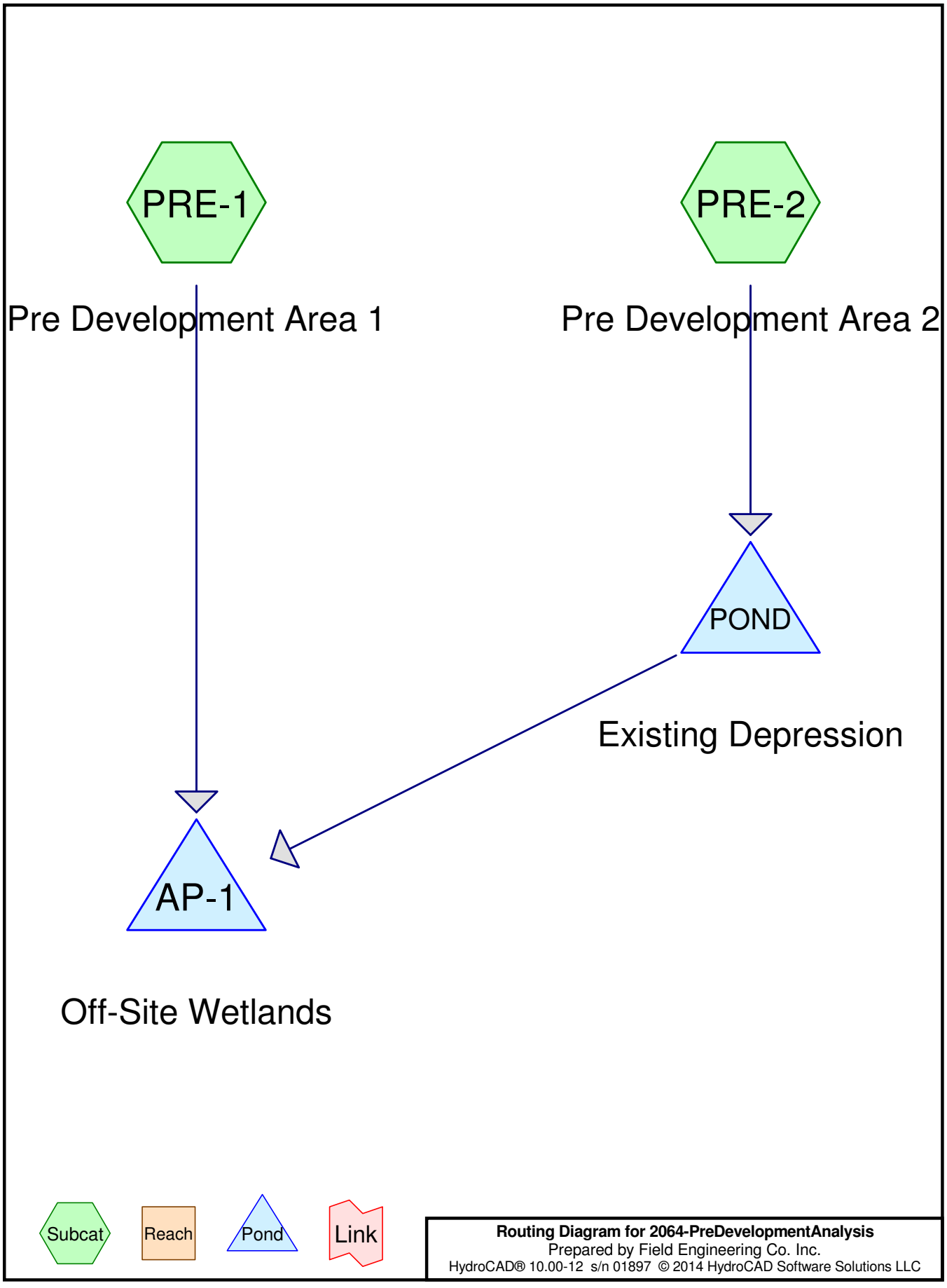
Invasive Species Control Plan (ISCP)

The owner will monitor the extended detention/infiltration basins, wet basin and sediment forebays pursuant to the recommendations outlined in the USACE document titled "New England District Compensatory Mitigation Guidance" document, pages 24-26 section 4.f. Invasive Species.. Due to the proximity of the wet basin and grassed channel to the existing bordering vegetated wetland, the applicant has chosen a mechanical control method of removal. Invasive species will be removed by hand (pulling, mowing or excavating on-site). No chemical control will be utilized.

Special attention will be given to assure that none of the following invasive species populate the storm water BMP's: common reed (*Phragmites australis*), Purple loosestrife (*Lythrum salicaria*), Smooth and Common buckthorn (*Frangula alnus, Rhamnus carthartica*), Russian and Autumn olives (*Elaeagnus angustifolia and E. umbellata*), Multiflora rose (*Rosa multiflora*), Reed canary-grass (*Phalaris arundinacea*), and Japanese knotweed (*Fallopia japonica*).

# *Section 2*

## *Pre Development Hydrologic Analysis*


PRE-1
PRE-2
Pre Development Area 1
Pre Development Area 2
POND
Existing Depression
AP-1
Off-Site Wetlands
Subcat
Reach
Pond
Link
Routing Diagram for 2064-PreDevelopmentAnalysis
Prepared by Field Engineering Co. Inc.
HydroCAD® 10.00-12 s/n 01897 © 2014 HydroCAD Software Solutions LLC

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

**Subcatchment PRE-1: Pre Development** Runoff Area=396,524 sf 0.00% Impervious Runoff Depth=0.28"
Flow Length=600' Slope=0.0070 '/' Tc=24.7 min CN=53 Runoff=0.85 cfs 9,296 cf

**Subcatchment PRE-2: Pre Development** Runoff Area=62,975 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=220' Slope=0.0100 '/' Tc=17.4 min CN=37 Runoff=0.00 cfs 3 cf

**Pond AP-1: Off-Site Wetlands** Inflow=0.85 cfs 9,296 cf
Primary=0.85 cfs 9,296 cf

**Pond POND: Existing Depression** Peak Elev=82.00' Storage=3 cf Inflow=0.00 cfs 3 cf
Outflow=0.00 cfs 0 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 9,299 cf Average Runoff Depth = 0.24"**
**100.00% Pervious = 459,499 sf 0.00% Impervious = 0 sf**

## Summary for Subcatchment PRE-1: Pre Development Area 1

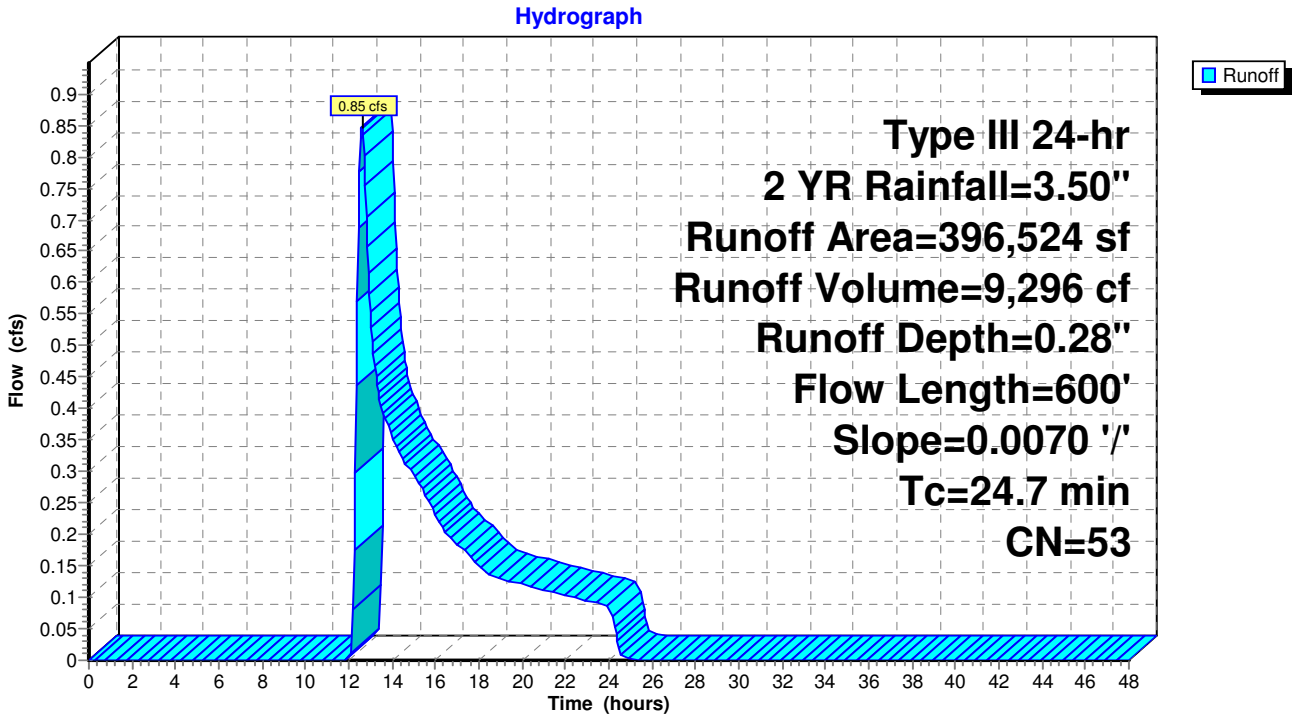
Runoff = 0.85 cfs @ 12.61 hrs, Volume= 9,296 cf, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.50"

| Area (sf) | CN | Description |
|---|---|---|
| 88,602 | 30 | Woods, Good, HSG A |
| 257,984 | 55 | Woods, Good, HSG B |
| 32,607 | 77 | Woods, Good, HSG D |
| 17,331 | 85 | Gravel roads, HSG B |
| 396,524 | 53 | Weighted Average |
| 396,524 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 17.9 | 50 | 0.0070 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 6.8 | 550 | 0.0070 | 1.35 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 24.7 | 600 | Total | | | |

## Subcatchment PRE-1: Pre Development Area 1



## Summary for Subcatchment PRE-2: Pre Development Area 2

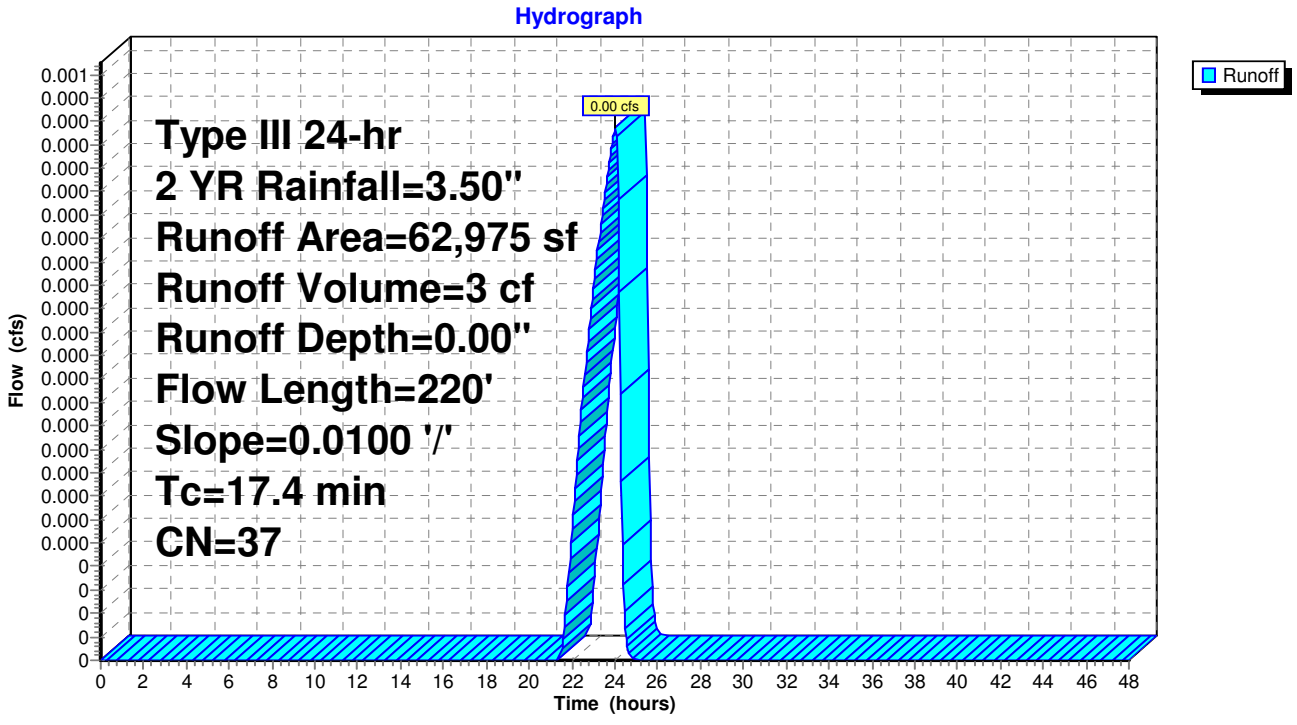
Runoff = 0.00 cfs @ 24.03 hrs, Volume= 3 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.50"

| Area (sf) | CN | Description |
|---|---|---|
| 49,637 | 30 | Woods, Good, HSG A |
| 8,472 | 55 | Woods, Good, HSG B |
| 1,855 | 76 | Gravel roads, HSG A |
| 3,011 | 85 | Gravel roads, HSG B |
| 62,975 | 37 | Weighted Average |
| 62,975 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.6 | 50 | 0.0100 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 1.8 | 170 | 0.0100 | 1.61 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 17.4 | 220 | Total | | | |

## Subcatchment PRE-2: Pre Development Area 2



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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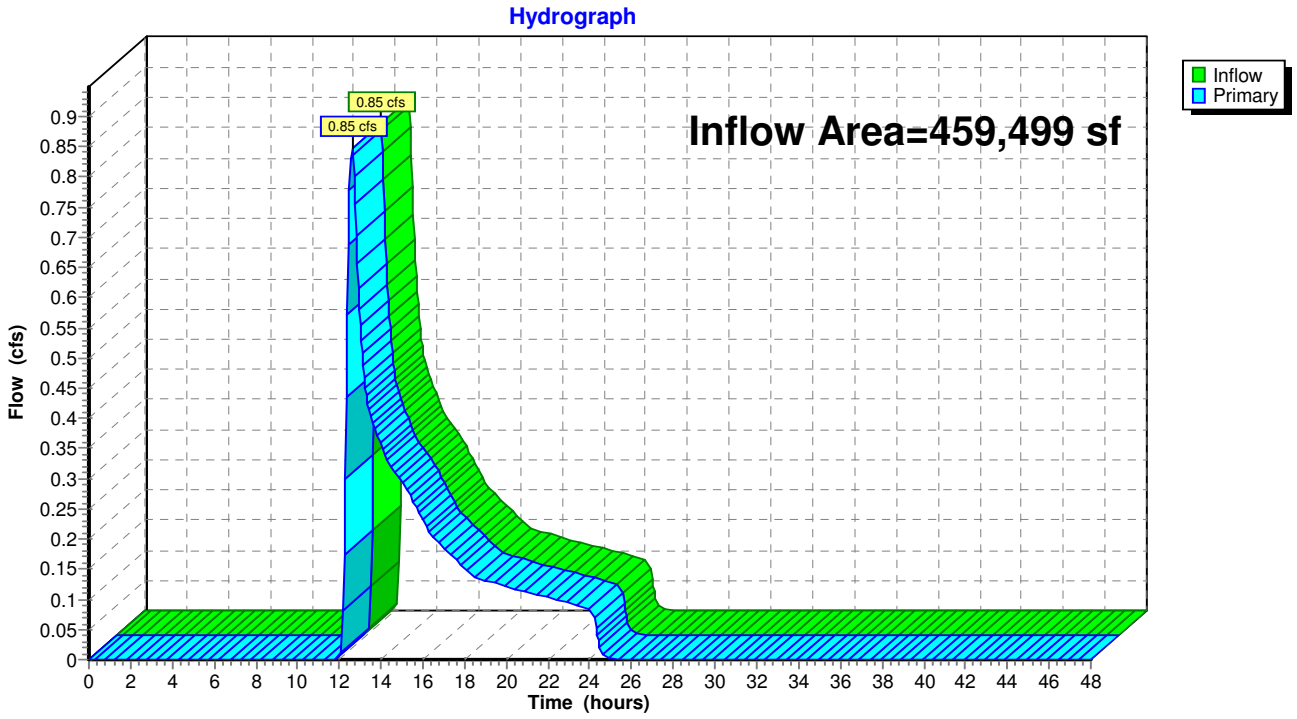
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 459,499 sf, 0.00% Impervious, Inflow Depth = 0.24" for 2 YR event
Inflow = 0.85 cfs @ 12.61 hrs, Volume= 9,296 cf
Primary = 0.85 cfs @ 12.61 hrs, Volume= 9,296 cf, Atten= 0%, Lag= 0.0 min

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND: Existing Depression

Inflow Area = 62,975 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2 YR event
Inflow = 0.00 cfs @ 24.03 hrs, Volume= 3 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 82.00' @ 25.05 hrs Surf.Area= 12,779 sf Storage= 3 cf

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

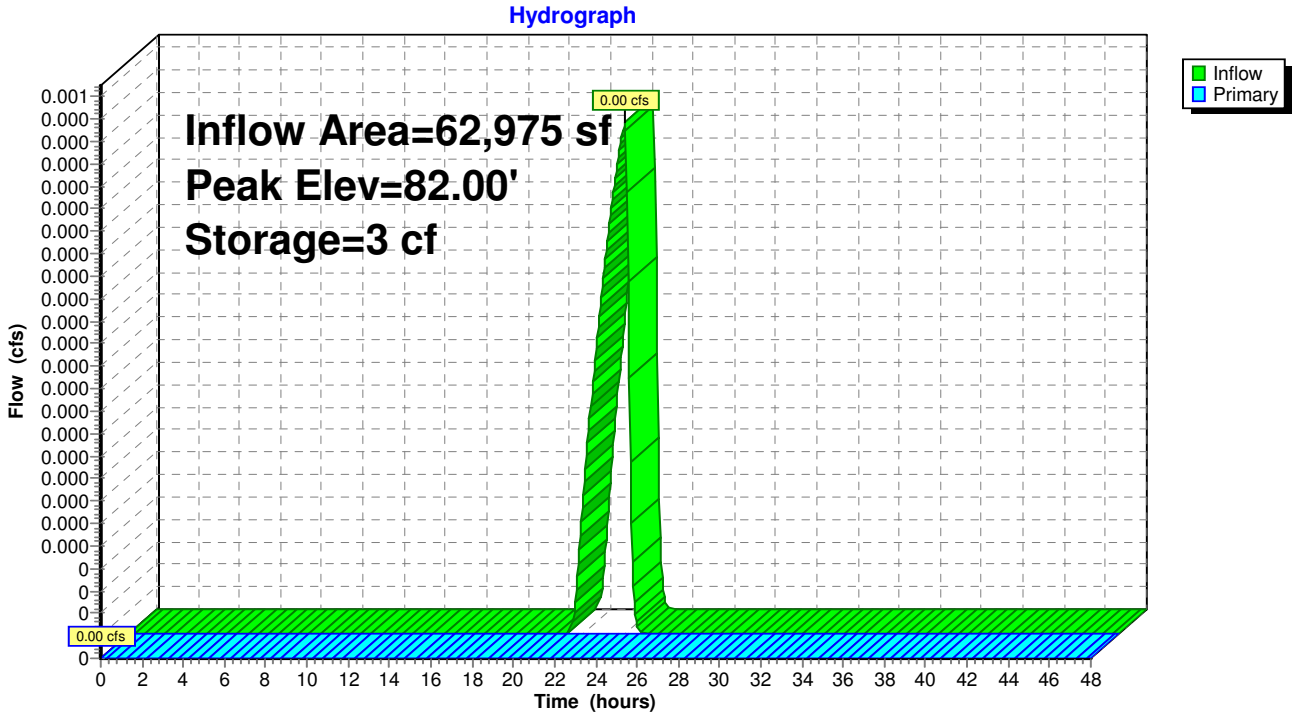
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 13,890 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 82.00 | 12,779 | 0 | 0 |
| 83.00 | 15,000 | 13,890 | 13,890 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 82.25' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=82.00' TW=0.00' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND: Existing Depression



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

**Subcatchment PRE-1: Pre Development** Runoff Area=396,524 sf 0.00% Impervious Runoff Depth=0.77"
Flow Length=600' Slope=0.0070 '/' Tc=24.7 min CN=53 Runoff=3.69 cfs 25,445 cf

**Subcatchment PRE-2: Pre Development** Runoff Area=62,975 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=220' Slope=0.0100 '/' Tc=17.4 min CN=37 Runoff=0.02 cfs 554 cf

**Pond AP-1: Off-Site Wetlands** Inflow=3.69 cfs 25,445 cf
Primary=3.69 cfs 25,445 cf

**Pond POND: Existing Depression** Peak Elev=82.04' Storage=554 cf Inflow=0.02 cfs 554 cf
Outflow=0.00 cfs 0 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 25,999 cf Average Runoff Depth = 0.68"**
**100.00% Pervious = 459,499 sf 0.00% Impervious = 0 sf**

## Summary for Subcatchment PRE-1: Pre Development Area 1

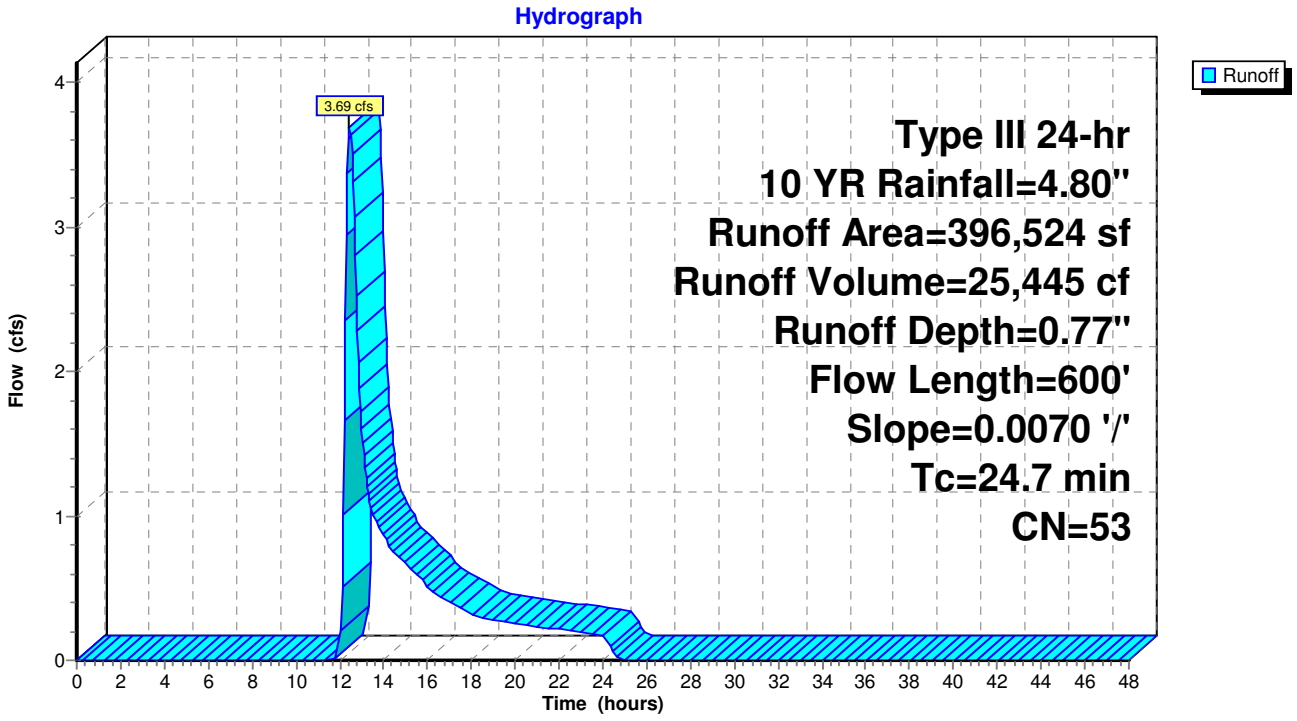
Runoff = 3.69 cfs @ 12.45 hrs, Volume= 25,445 cf, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.80"

| Area (sf) | CN | Description |
|---|---|---|
| 88,602 | 30 | Woods, Good, HSG A |
| 257,984 | 55 | Woods, Good, HSG B |
| 32,607 | 77 | Woods, Good, HSG D |
| 17,331 | 85 | Gravel roads, HSG B |
| 396,524 | 53 | Weighted Average |
| 396,524 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 17.9 | 50 | 0.0070 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 6.8 | 550 | 0.0070 | 1.35 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 24.7 | 600 | Total | | | |

## Subcatchment PRE-1: Pre Development Area 1



## Summary for Subcatchment PRE-2: Pre Development Area 2

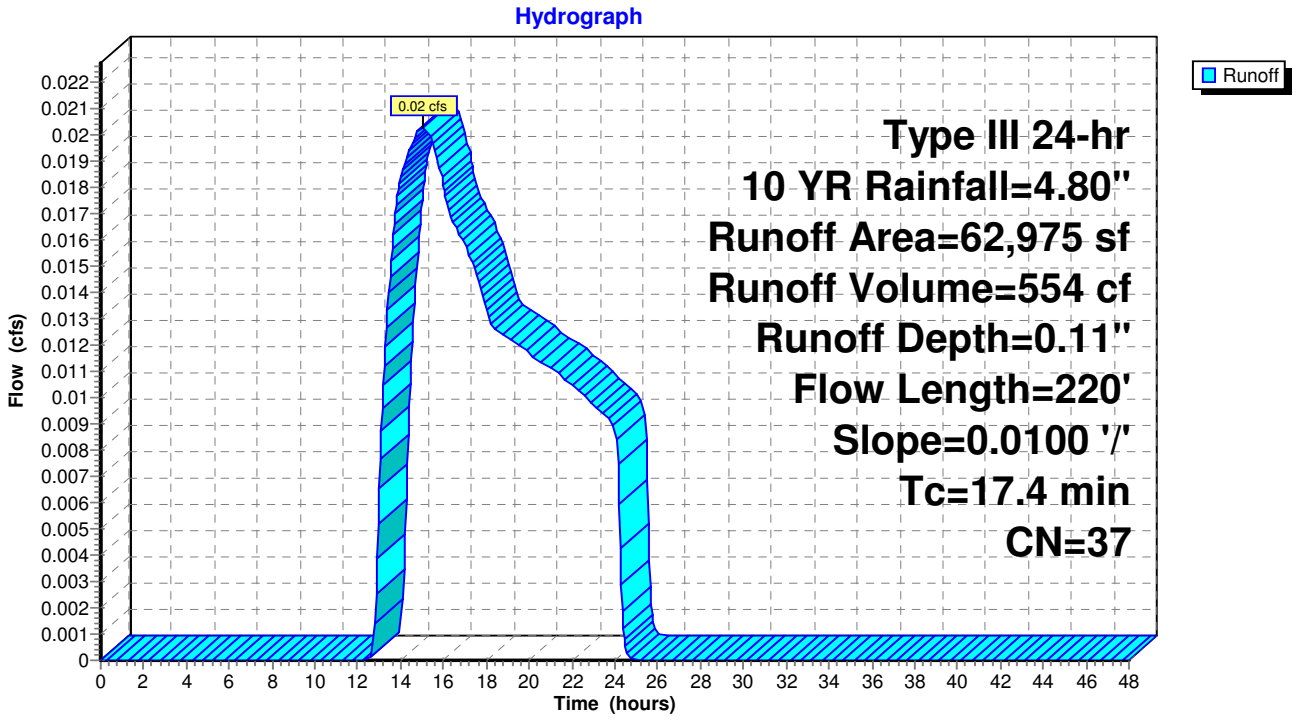
Runoff = 0.02 cfs @ 15.01 hrs, Volume= 554 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.80"

| Area (sf) | CN | Description |
|---|---|---|
| 49,637 | 30 | Woods, Good, HSG A |
| 8,472 | 55 | Woods, Good, HSG B |
| 1,855 | 76 | Gravel roads, HSG A |
| 3,011 | 85 | Gravel roads, HSG B |
| 62,975 | 37 | Weighted Average |
| 62,975 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.6 | 50 | 0.0100 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 1.8 | 170 | 0.0100 | 1.61 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 17.4 | 220 | Total | | | |

## Subcatchment PRE-2: Pre Development Area 2



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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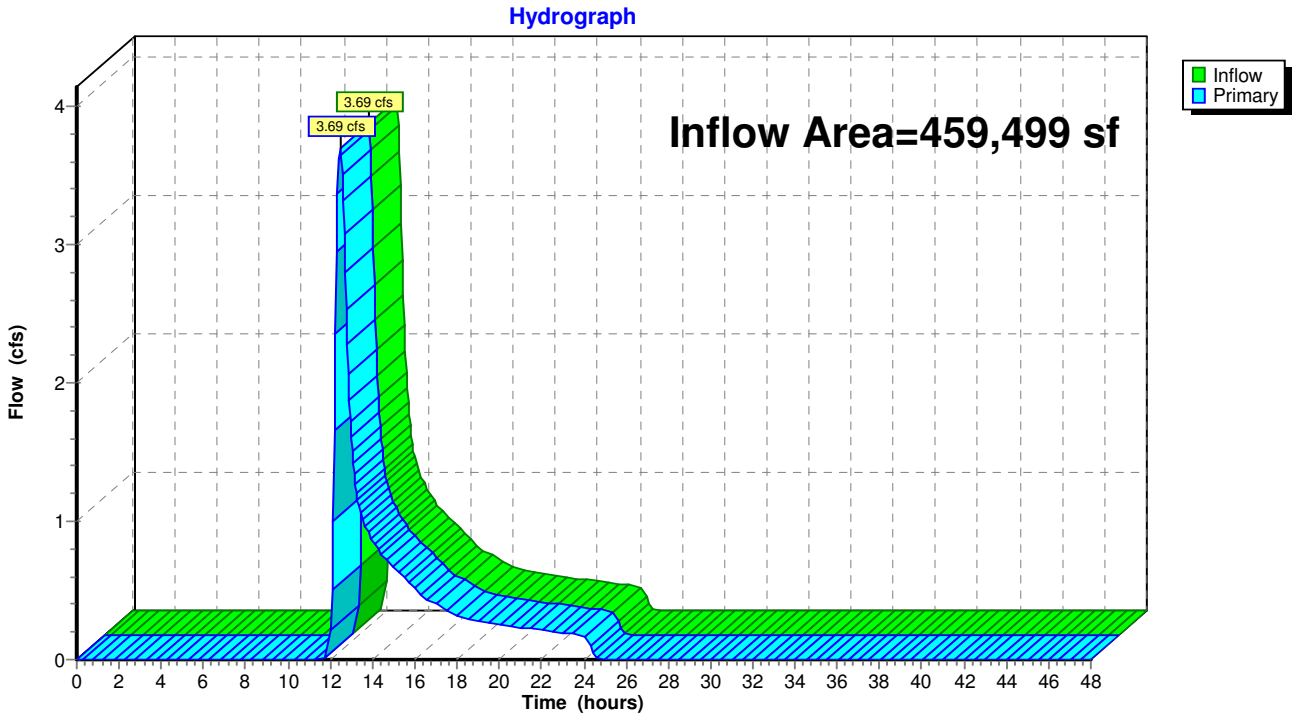
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 459,499 sf, 0.00% Impervious, Inflow Depth = 0.66" for 10 YR event
Inflow = 3.69 cfs @ 12.45 hrs, Volume= 25,445 cf
Primary = 3.69 cfs @ 12.45 hrs, Volume= 25,445 cf, Atten= 0%, Lag= 0.0 min

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND: Existing Depression

Inflow Area = 62,975 sf, 0.00% Impervious, Inflow Depth = 0.11" for 10 YR event
Inflow = 0.02 cfs @ 15.01 hrs, Volume= 554 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 82.04' @ 25.05 hrs Surf.Area= 12,875 sf Storage= 554 cf

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

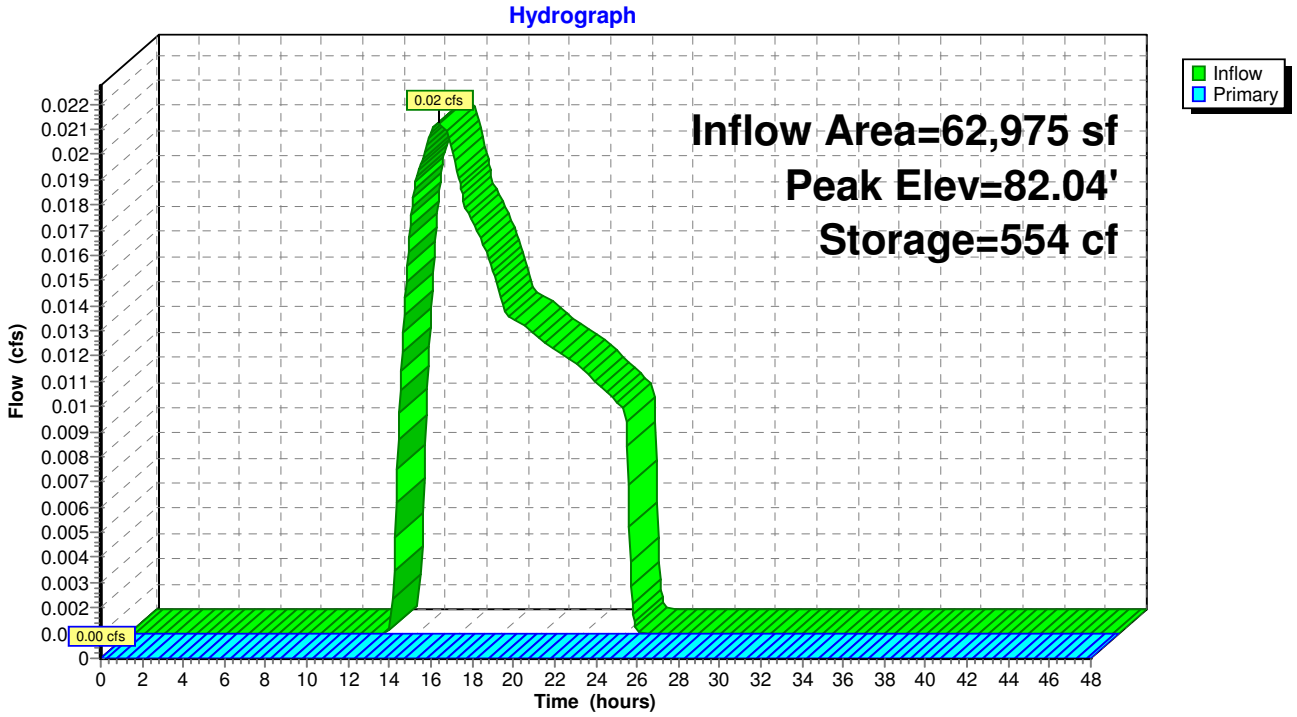
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 13,890 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 82.00 | 12,779 | 0 | 0 |
| 83.00 | 15,000 | 13,890 | 13,890 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 82.25' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=82.00' TW=0.00' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND: Existing Depression



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

**Subcatchment PRE-1: Pre Development** Runoff Area=396,524 sf 0.00% Impervious Runoff Depth=1.15"
Flow Length=600' Slope=0.0070 '/' Tc=24.7 min CN=53 Runoff=6.23 cfs 38,112 cf

**Subcatchment PRE-2: Pre Development** Runoff Area=62,975 sf 0.00% Impervious Runoff Depth=0.25"
Flow Length=220' Slope=0.0100 '/' Tc=17.4 min CN=37 Runoff=0.07 cfs 1,315 cf

**Pond AP-1: Off-Site Wetlands** Inflow=6.23 cfs 38,112 cf
Primary=6.23 cfs 38,112 cf

**Pond POND: Existing Depression** Peak Elev=82.10' Storage=1,315 cf Inflow=0.07 cfs 1,315 cf
Outflow=0.00 cfs 0 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 39,427 cf Average Runoff Depth = 1.03"**
**100.00% Pervious = 459,499 sf 0.00% Impervious = 0 sf**

## Summary for Subcatchment PRE-1: Pre Development Area 1

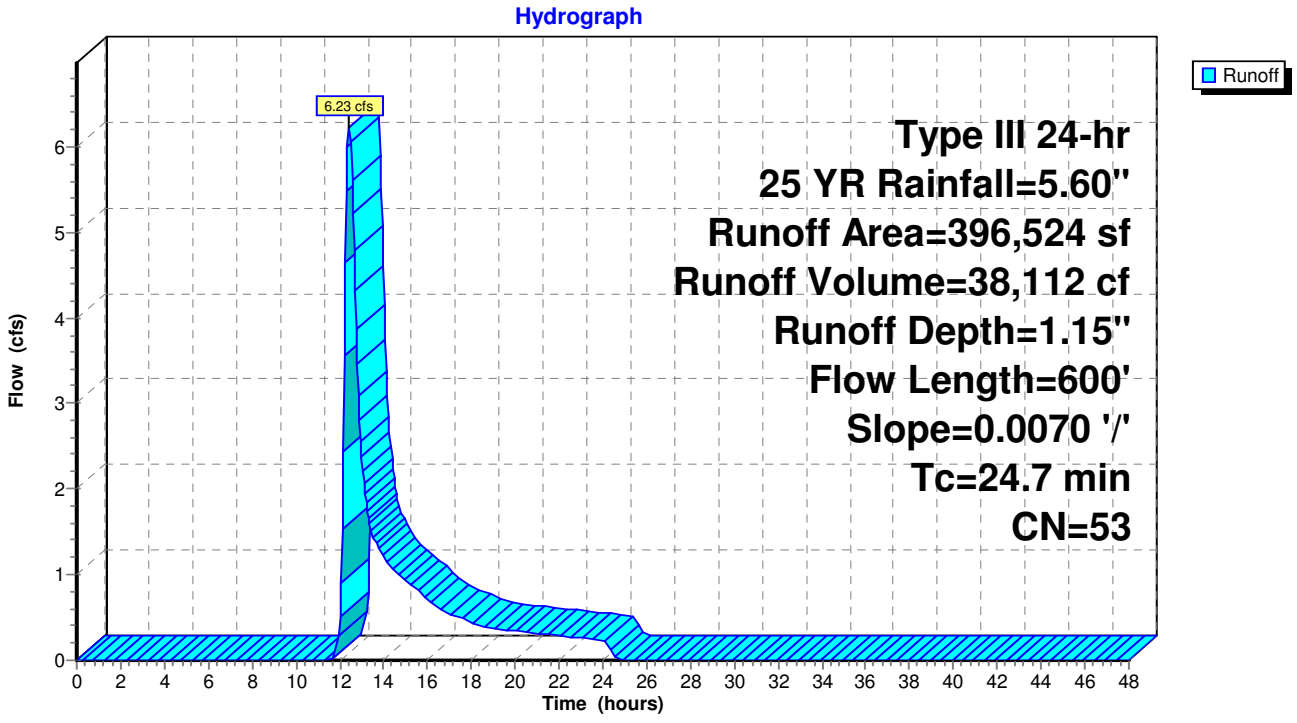
Runoff = 6.23 cfs @ 12.42 hrs, Volume= 38,112 cf, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.60"

| Area (sf) | CN | Description |
|---|---|---|
| 88,602 | 30 | Woods, Good, HSG A |
| 257,984 | 55 | Woods, Good, HSG B |
| 32,607 | 77 | Woods, Good, HSG D |
| 17,331 | 85 | Gravel roads, HSG B |
| 396,524 | 53 | Weighted Average |
| 396,524 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 17.9 | 50 | 0.0070 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 6.8 | 550 | 0.0070 | 1.35 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 24.7 | 600 | Total | | | |

## Subcatchment PRE-1: Pre Development Area 1



## Summary for Subcatchment PRE-2: Pre Development Area 2

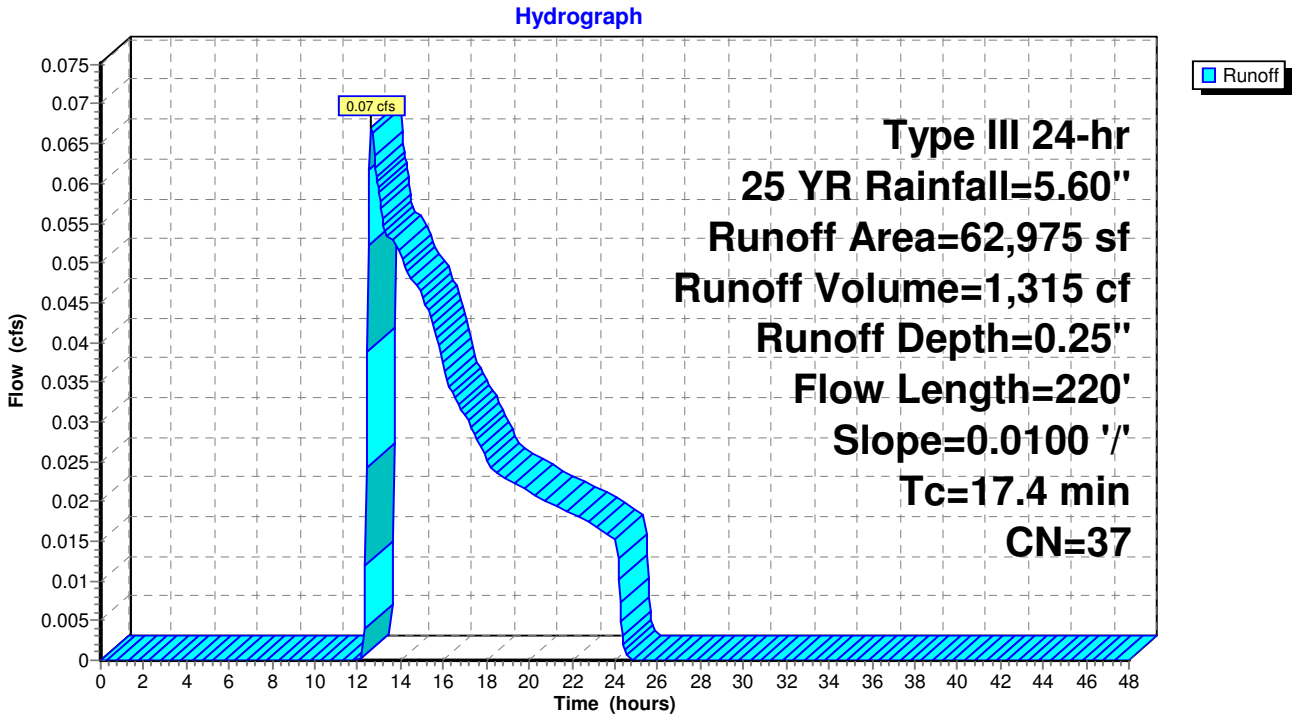
Runoff = 0.07 cfs @ 12.64 hrs, Volume= 1,315 cf, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.60"

| Area (sf) | CN | Description |
|---|---|---|
| 49,637 | 30 | Woods, Good, HSG A |
| 8,472 | 55 | Woods, Good, HSG B |
| 1,855 | 76 | Gravel roads, HSG A |
| 3,011 | 85 | Gravel roads, HSG B |
| 62,975 | 37 | Weighted Average |
| 62,975 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.6 | 50 | 0.0100 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 1.8 | 170 | 0.0100 | 1.61 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 17.4 | 220 | Total | | | |

## Subcatchment PRE-2: Pre Development Area 2



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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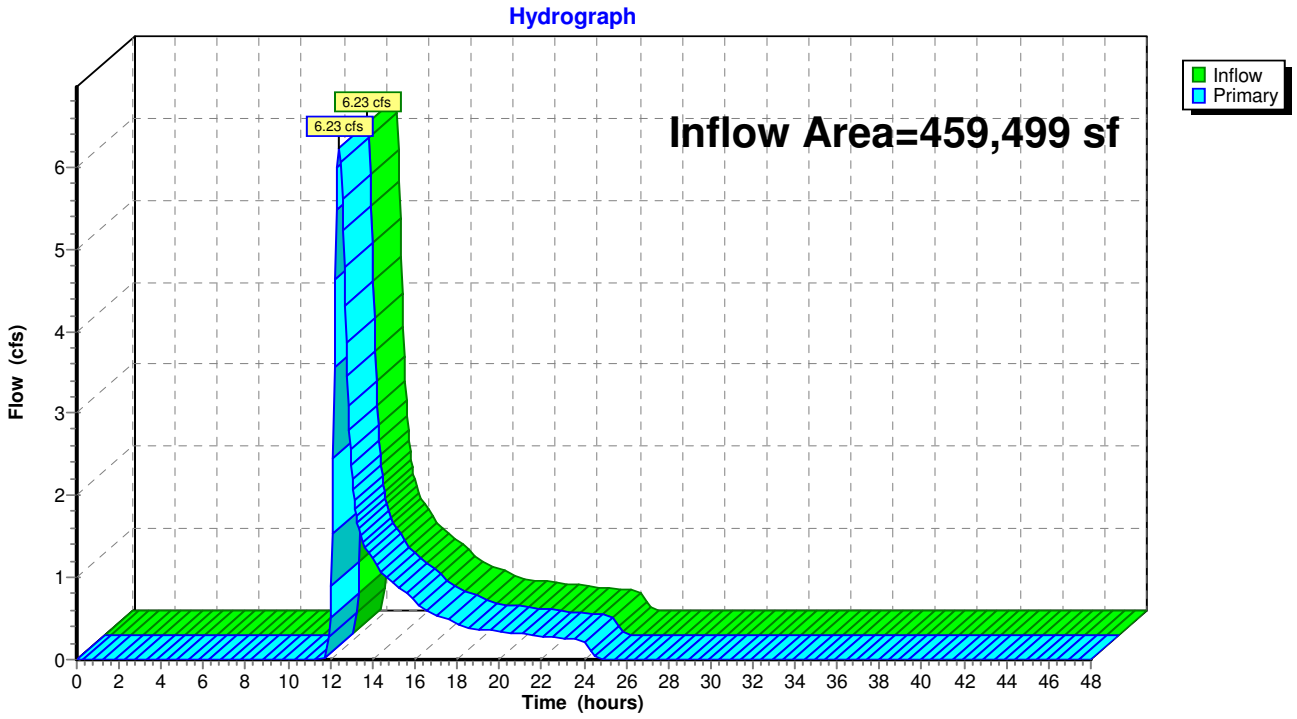
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 459,499 sf, 0.00% Impervious, Inflow Depth = 1.00" for 25 YR event
Inflow = 6.23 cfs @ 12.42 hrs, Volume= 38,112 cf
Primary = 6.23 cfs @ 12.42 hrs, Volume= 38,112 cf, Atten= 0%, Lag= 0.0 min

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND: Existing Depression

Inflow Area = 62,975 sf, 0.00% Impervious, Inflow Depth = 0.25" for 25 YR event
Inflow = 0.07 cfs @ 12.64 hrs, Volume= 1,315 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 82.10' @ 25.05 hrs Surf.Area= 13,006 sf Storage= 1,315 cf

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

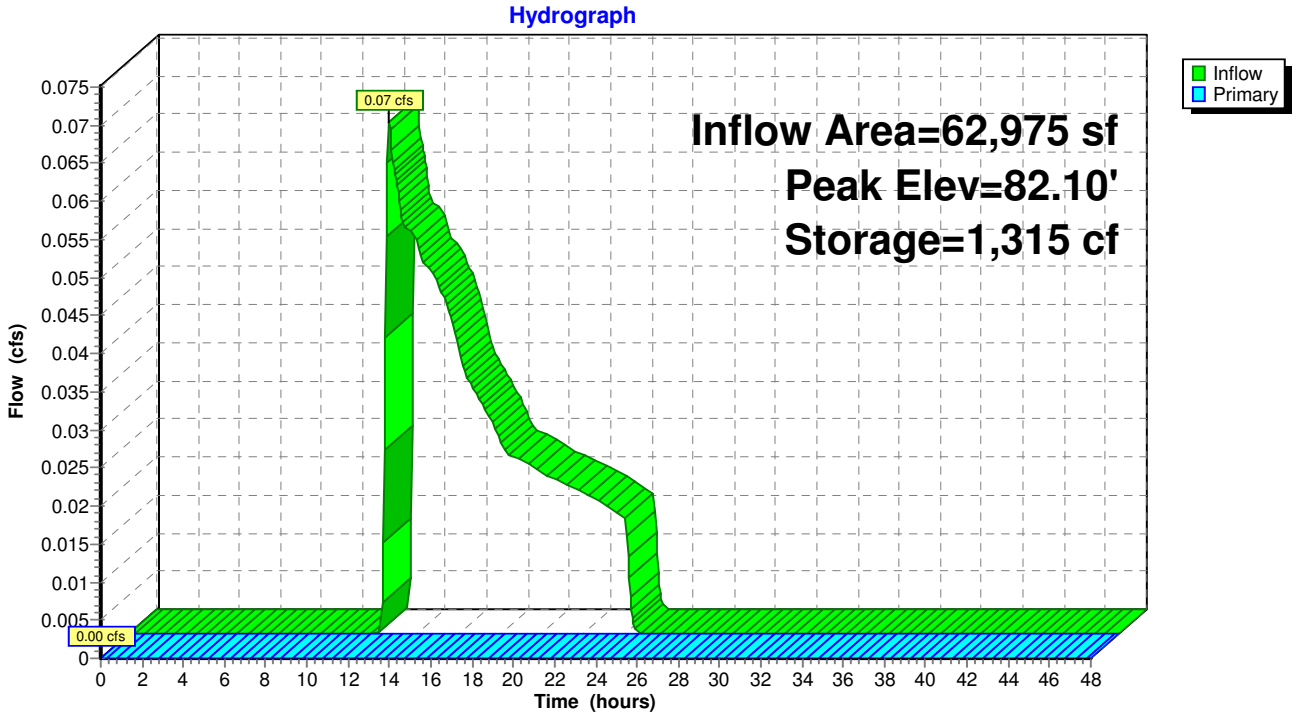
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 13,890 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 82.00 | 12,779 | 0 | 0 |
| 83.00 | 15,000 | 13,890 | 13,890 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 82.25' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=82.00' TW=0.00' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND: Existing Depression



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

**Subcatchment PRE-1: Pre Development** Runoff Area=396,524 sf 0.00% Impervious Runoff Depth=1.94"
Flow Length=600' Slope=0.0070 '/' Tc=24.7 min CN=53 Runoff=11.56 cfs 64,040 cf

**Subcatchment PRE-2: Pre Development** Runoff Area=62,975 sf 0.00% Impervious Runoff Depth=0.63"
Flow Length=220' Slope=0.0100 '/' Tc=17.4 min CN=37 Runoff=0.36 cfs 3,288 cf

**Pond AP-1: Off-Site Wetlands** Inflow=11.56 cfs 64,064 cf
Primary=11.56 cfs 64,064 cf

**Pond POND: Existing Depression** Peak Elev=82.25' Storage=3,284 cf Inflow=0.36 cfs 3,288 cf
Outflow=0.00 cfs 24 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 67,328 cf Average Runoff Depth = 1.76"**
**100.00% Pervious = 459,499 sf 0.00% Impervious = 0 sf**

## Summary for Subcatchment PRE-1: Pre Development Area 1

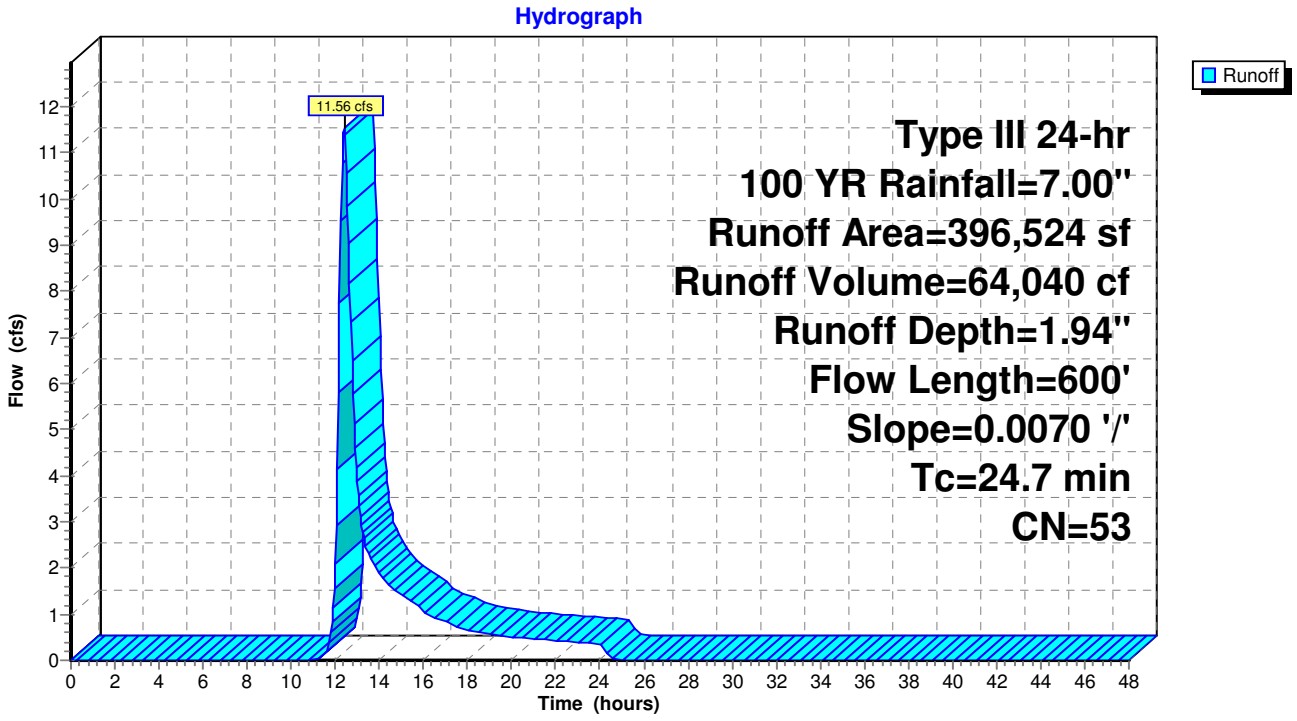
Runoff = 11.56 cfs @ 12.39 hrs, Volume= 64,040 cf, Depth= 1.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

| Area (sf) | CN | Description |
|---|---|---|
| 88,602 | 30 | Woods, Good, HSG A |
| 257,984 | 55 | Woods, Good, HSG B |
| 32,607 | 77 | Woods, Good, HSG D |
| 17,331 | 85 | Gravel roads, HSG B |
| 396,524 | 53 | Weighted Average |
| 396,524 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 17.9 | 50 | 0.0070 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 6.8 | 550 | 0.0070 | 1.35 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 24.7 | 600 | Total | | | |

## Subcatchment PRE-1: Pre Development Area 1



## Summary for Subcatchment PRE-2: Pre Development Area 2

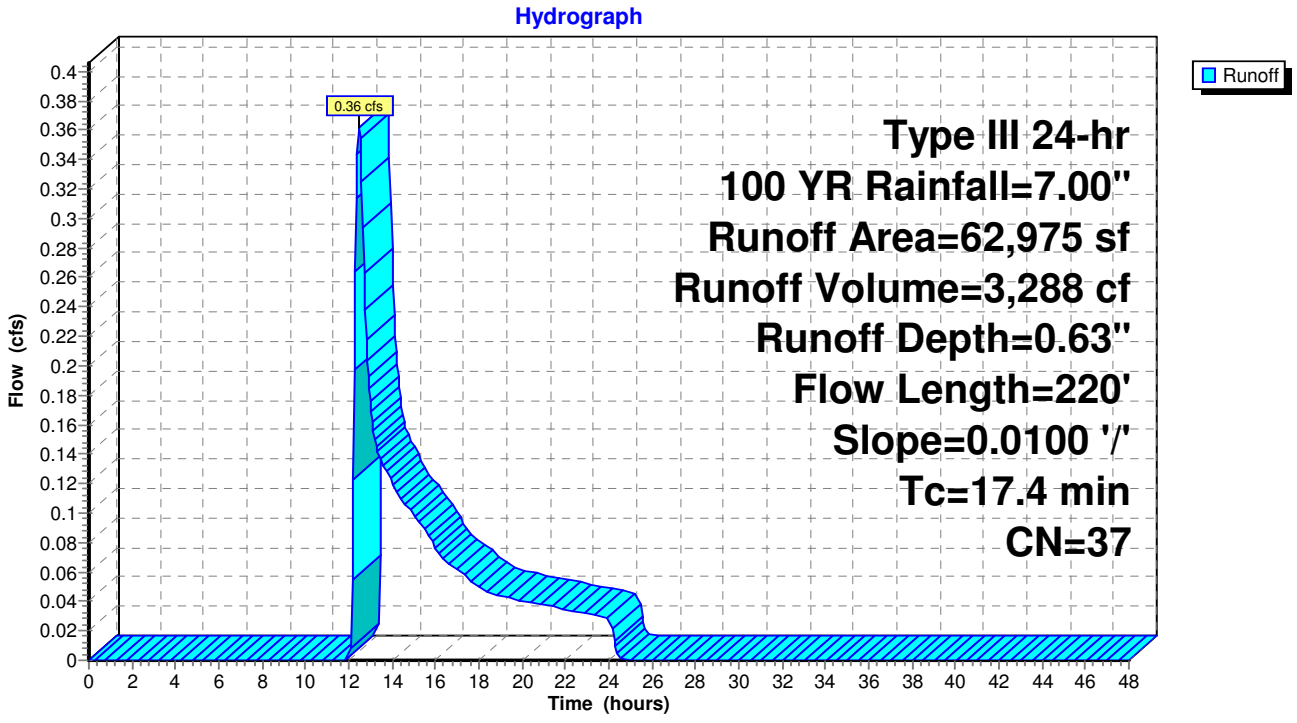
Runoff = 0.36 cfs @ 12.48 hrs, Volume= 3,288 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

| Area (sf) | CN | Description |
|---|---|---|
| 49,637 | 30 | Woods, Good, HSG A |
| 8,472 | 55 | Woods, Good, HSG B |
| 1,855 | 76 | Gravel roads, HSG A |
| 3,011 | 85 | Gravel roads, HSG B |
| 62,975 | 37 | Weighted Average |
| 62,975 | | 100.00% Pervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 15.6 | 50 | 0.0100 | 0.05 | | **Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.50" |
| 1.8 | 170 | 0.0100 | 1.61 | | **Shallow Concentrated Flow, B-C** Unpaved Kv= 16.1 fps |
| 17.4 | 220 | Total | | | |

## Subcatchment PRE-2: Pre Development Area 2



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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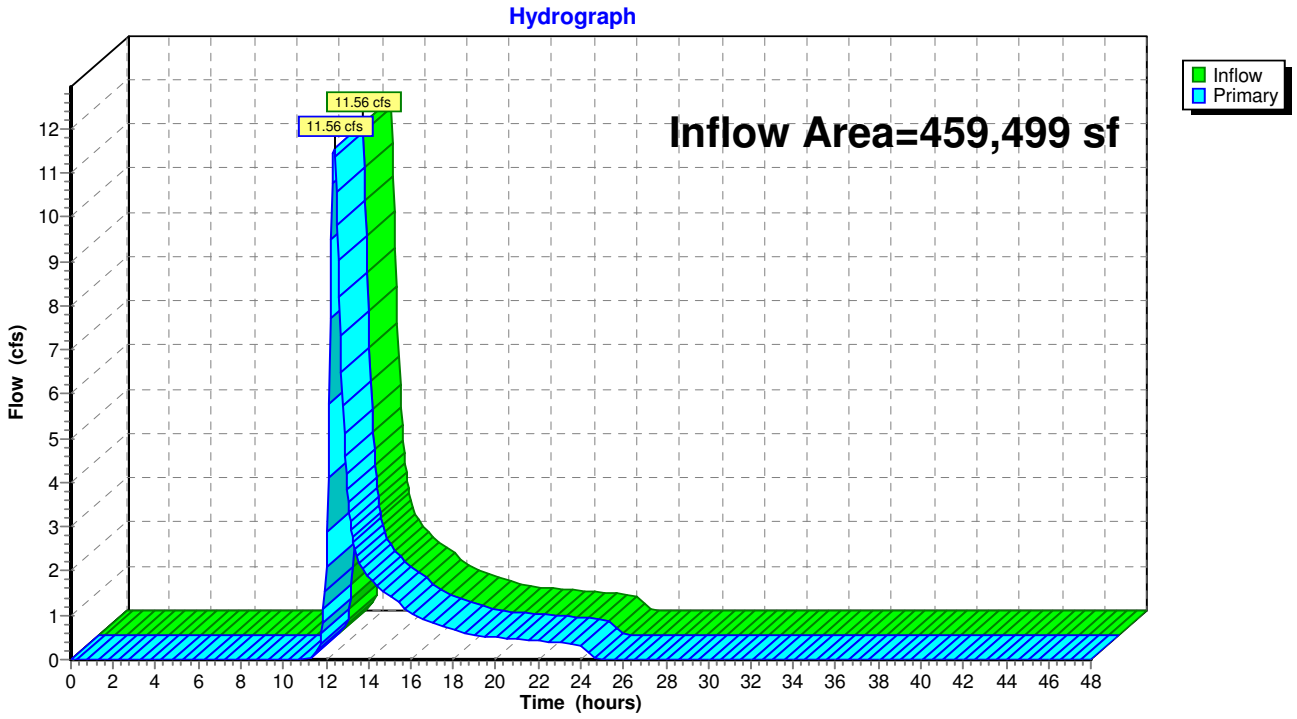
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 459,499 sf, 0.00% Impervious, Inflow Depth = 1.67" for 100 YR event
Inflow = 11.56 cfs @ 12.39 hrs, Volume= 64,064 cf
Primary = 11.56 cfs @ 12.39 hrs, Volume= 64,064 cf, Atten= 0%, Lag= 0.0 min

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND: Existing Depression

Inflow Area = 62,975 sf, 0.00% Impervious, Inflow Depth = 0.63" for 100 YR event
Inflow = 0.36 cfs @ 12.48 hrs, Volume= 3,288 cf
Outflow = 0.00 cfs @ 24.44 hrs, Volume= 24 cf, Atten= 99%, Lag= 717.4 min
Primary = 0.00 cfs @ 24.44 hrs, Volume= 24 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 82.25' @ 24.44 hrs Surf.Area= 13,338 sf Storage= 3,284 cf

Plug-Flow detention time= 887.6 min calculated for 24 cf (1% of inflow)
Center-of-Mass det. time= 662.8 min ( 1,618.8 - 956.0 )

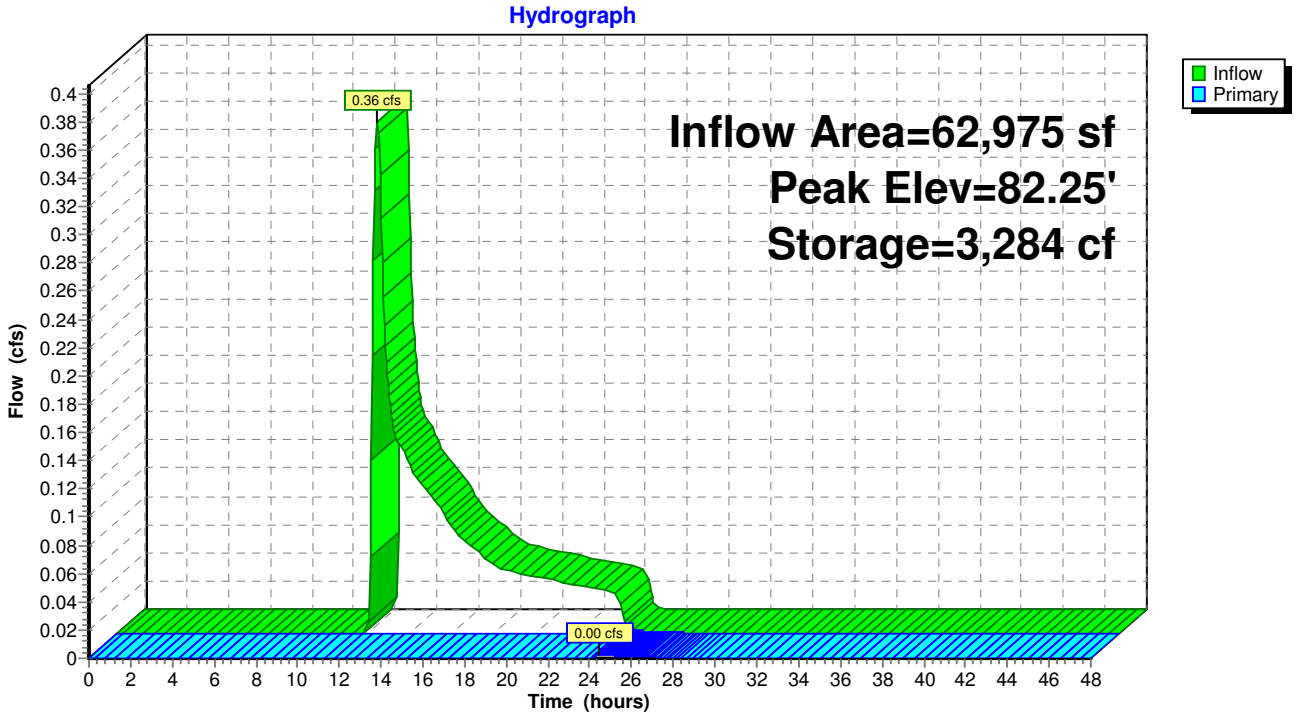
| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 82.00' | 13,890 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 82.00 | 12,779 | 0 | 0 |
| 83.00 | 15,000 | 13,890 | 13,890 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 82.25' | **20.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

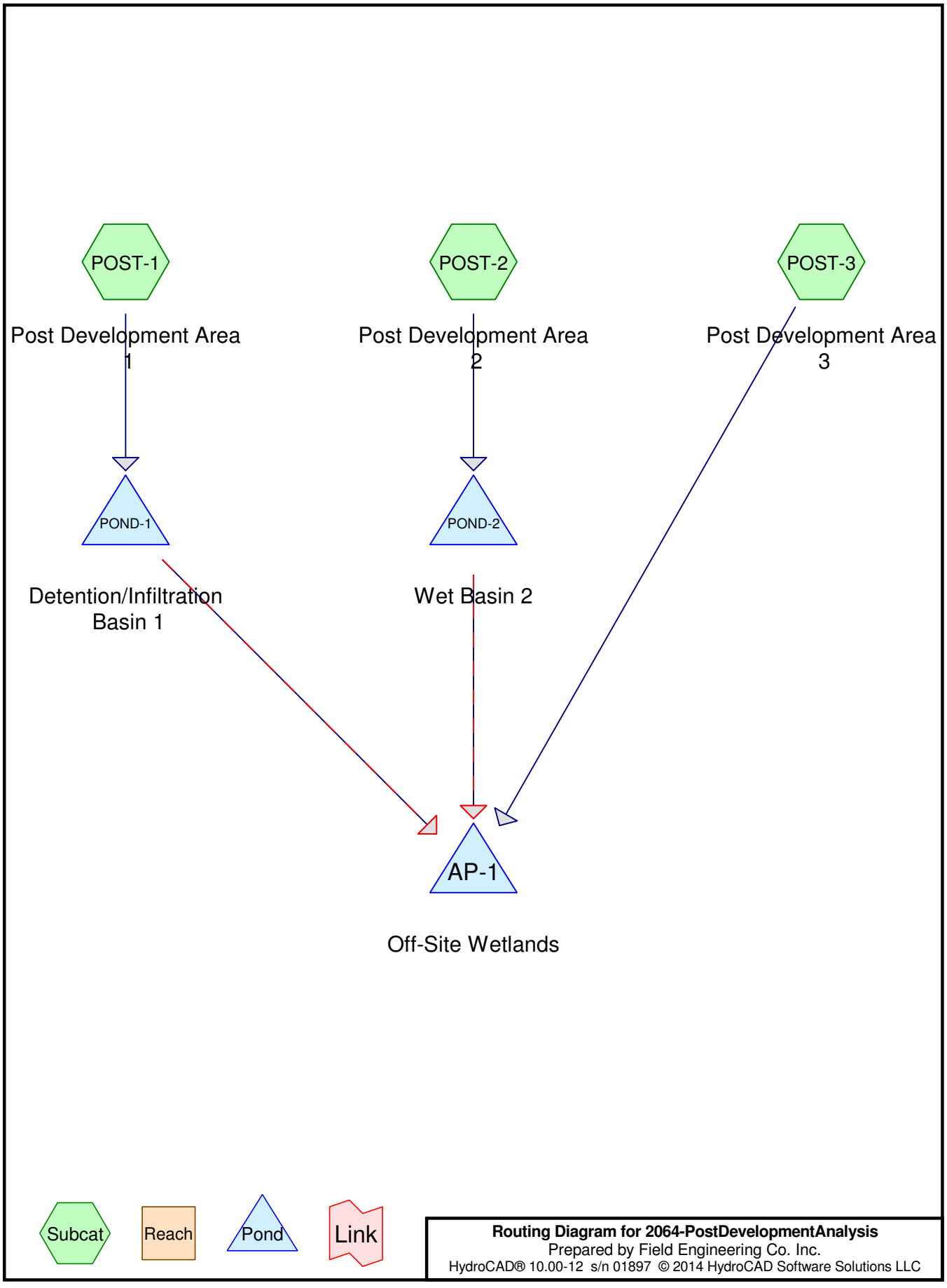
**Primary OutFlow** Max=0.00 cfs @ 24.44 hrs HW=82.25' TW=0.00' (Dynamic Tailwater)
**1=Broad-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.10 fps)

## Pond POND: Existing Depression



# *Section 3*

## *Post Development Hydrologic Analysis*




**Routing Diagram for 2064-PostDevelopmentAnalysis**
Prepared by Field Engineering Co. Inc.

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

**Subcatchment POST-1: Post** Runoff Area=215,535 sf 74.55% Impervious Runoff Depth=2.84"
Flow Length=325' Slope=0.0050 '/' Tc=17.6 min CN=94 Runoff=11.15 cfs 50,931 cf

**Subcatchment POST-2: Post Development** Runoff Area=39,144 sf 45.90% Impervious Runoff Depth=0.85"
Flow Length=270' Tc=15.7 min CN=67 Runoff=0.57 cfs 2,773 cf

**Subcatchment POST-3: Post** Runoff Area=204,820 sf 10.33% Impervious Runoff Depth=0.35"
Flow Length=280' Slope=0.0050 '/' Tc=17.0 min CN=55 Runoff=0.70 cfs 5,901 cf

**Pond AP-1: Off-Site Wetlands** Inflow=0.74 cfs 9,100 cf
Primary=0.74 cfs 9,100 cf

**Pond POND-1: Detention/Infiltration Basin** Peak Elev=80.93' Storage=25,633 cf Inflow=11.15 cfs 50,931 cf
Discarded=0.68 cfs 50,466 cf Primary=0.03 cfs 502 cf Secondary=0.00 cfs 0 cf Outflow=0.71 cfs 50,968 cf

**Pond POND-2: Wet Basin 2** Peak Elev=79.37' Storage=1,333 cf Inflow=0.57 cfs 2,773 cf
Primary=0.06 cfs 2,697 cf Secondary=0.00 cfs 0 cf Outflow=0.06 cfs 2,697 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 59,606 cf Average Runoff Depth = 1.56"**
**56.51% Pervious = 259,679 sf 43.49% Impervious = 199,820 sf**

## Summary for Subcatchment POST-1: Post Development Area 1

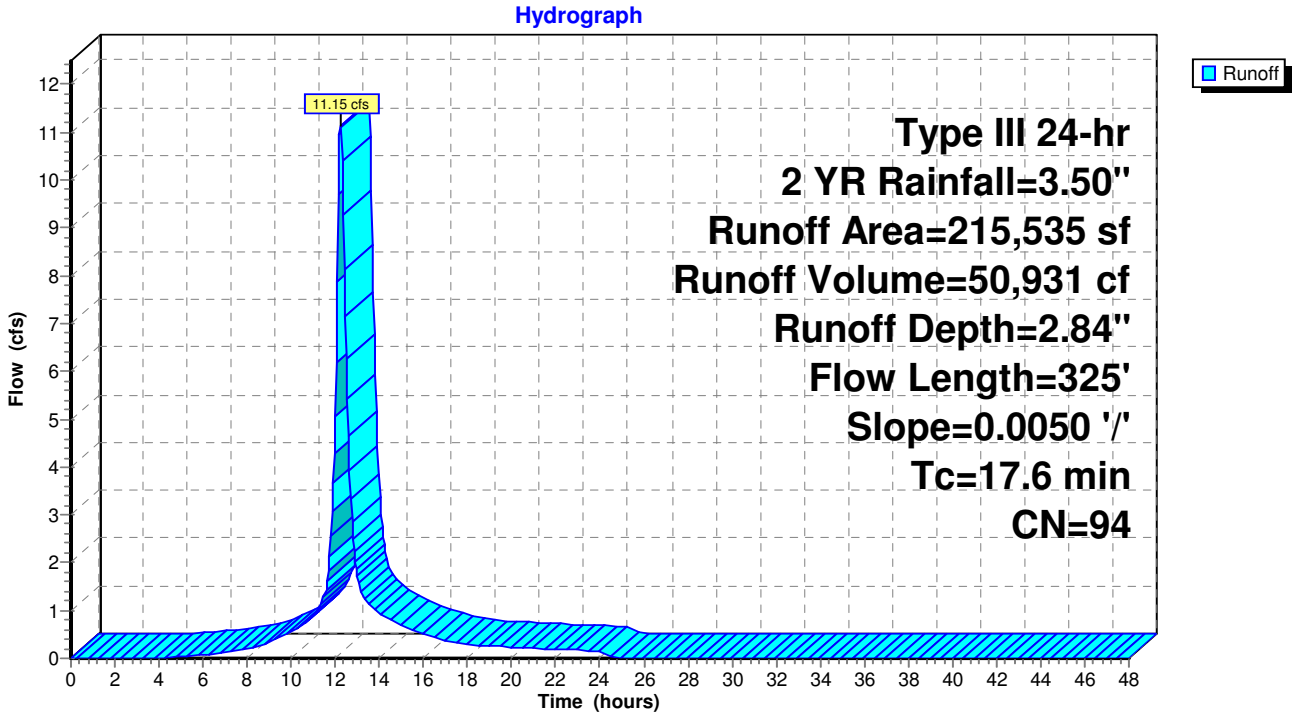
Runoff = 11.15 cfs @ 12.23 hrs, Volume= 50,931 cf, Depth= 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.50"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 19,280 | 98 | Roofs, HSG A |
| | 126,684 | 98 | Roofs, HSG B |
| | 6,762 | 98 | Paved parking, HSG B |
| | 7,964 | 98 | Paved parking, HSG D |
| | 18,833 | 61 | >75% Grass cover, Good, HSG B |
| | 7,124 | 80 | >75% Grass cover, Good, HSG D |
| * | 23,414 | 98 | Water Surface, 0% imp, HSG B (Basin Bottom) |
| * | 5,474 | 98 | Water Surface, 0% imp, HSG D (Basin Bottom) |
| | 215,535 | 94 | Weighted Average |
| | 54,845 | | 25.45% Pervious Area |
| | 160,690 | | 74.55% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 4.0 | 275 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 17.6 | 325 | Total | | | |

## Subcatchment POST-1: Post Development Area 1



## Summary for Subcatchment POST-2: Post Development Area 2

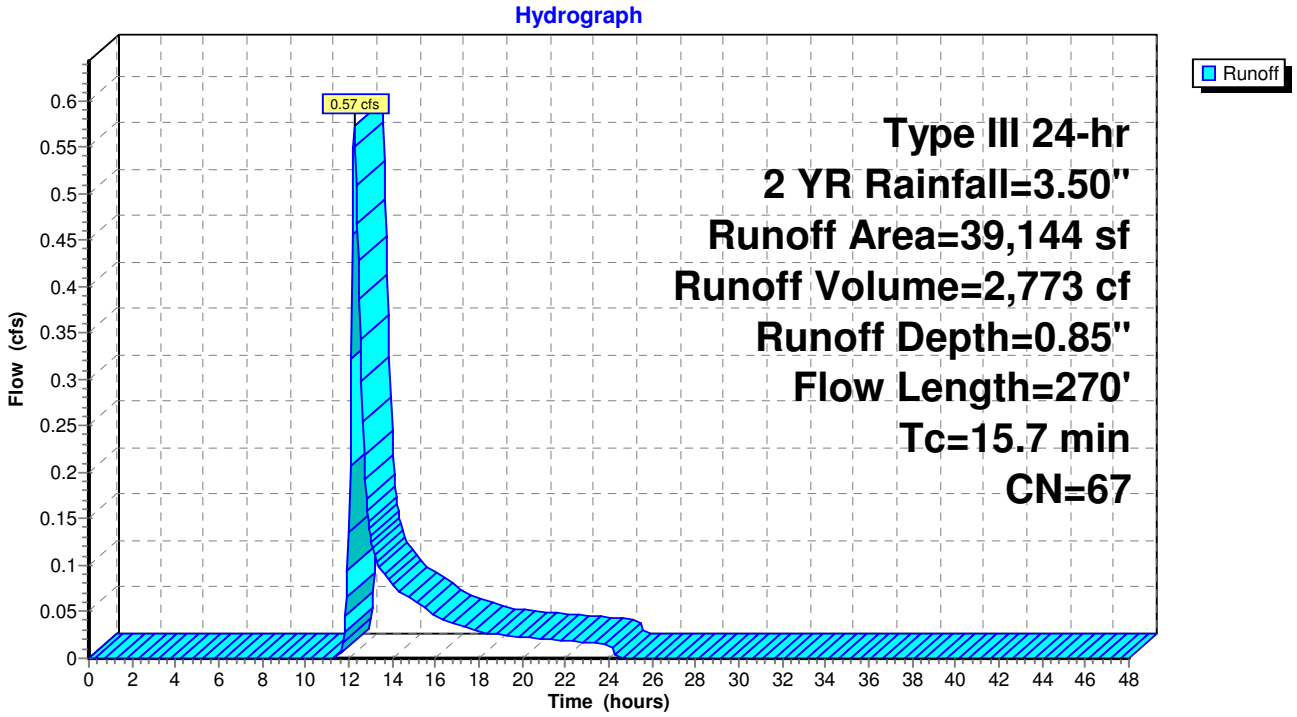
Runoff = 0.57 cfs @ 12.25 hrs, Volume= 2,773 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.50"

| Area (sf) | CN | Description |
|---|---|---|
| 10,044 | 98 | Paved parking, HSG A |
| 7,924 | 98 | Paved parking, HSG B |
| 20,139 | 39 | >75% Grass cover, Good, HSG A |
| 1,037 | 61 | >75% Grass cover, Good, HSG B |
| 39,144 | 67 | Weighted Average |
| 21,176 | | 54.10% Pervious Area |
| 17,968 | | 45.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 1.5 | 100 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, C-D**<br>Paved Kv= 20.3 fps |
| 0.3 | 80 | 0.0100 | 4.54 | 3.56 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 15.7 | 270 | Total | | | |

## Subcatchment POST-2: Post Development Area 2



## Summary for Subcatchment POST-3: Post Development Area 3

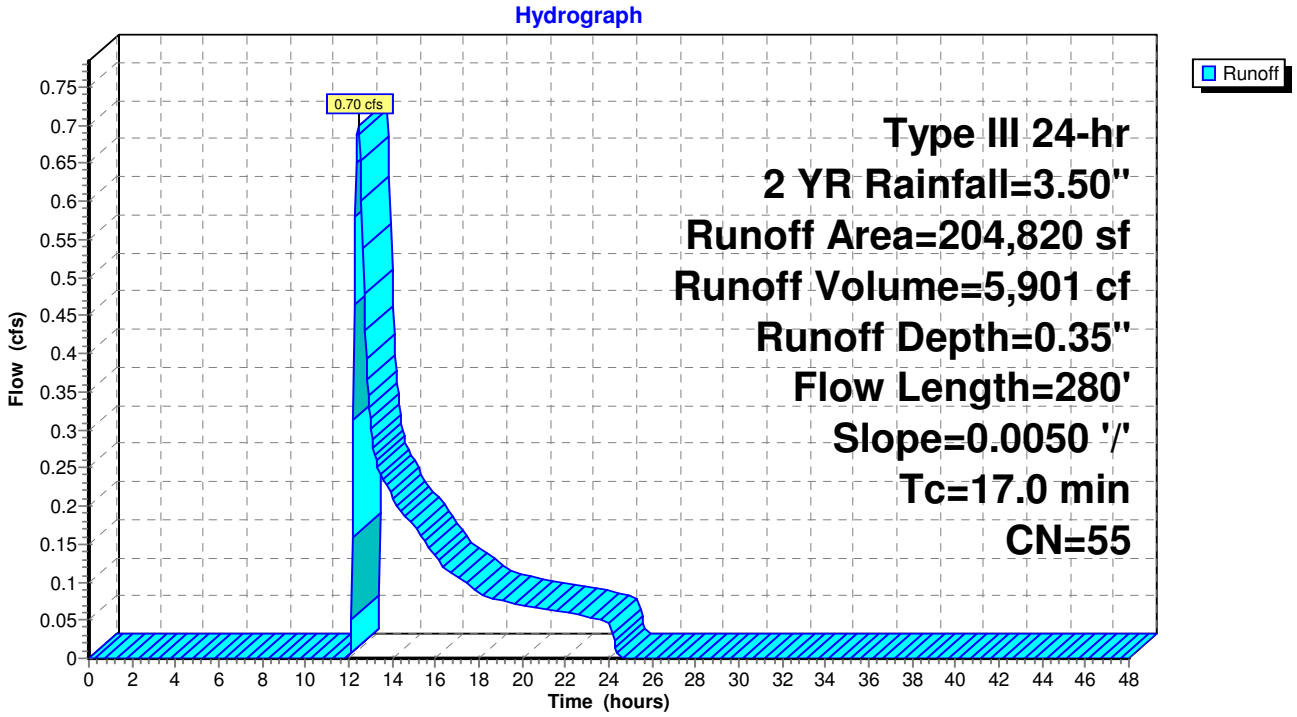
Runoff = 0.70 cfs @ 12.45 hrs, Volume= 5,901 cf, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.50"

| Area (sf) | CN | Description |
|---|---|---|
| 56,448 | 30 | Woods, Good, HSG A |
| 49,002 | 55 | Woods, Good, HSG B |
| 11,545 | 77 | Woods, Good, HSG D |
| 20,666 | 39 | >75% Grass cover, Good, HSG A |
| 29,676 | 61 | >75% Grass cover, Good, HSG B |
| 1,640 | 76 | Gravel roads, HSG A |
| 14,681 | 85 | Gravel roads, HSG B |
| 11,877 | 98 | Paved parking, HSG A |
| 8,785 | 98 | Paved parking, HSG B |
| 500 | 98 | Paved parking, HSG D |
| 204,820 | 55 | Weighted Average |
| 183,658 | | 89.67% Pervious Area |
| 21,162 | | 10.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B** |
| | | | | | Grass: Dense n= 0.240 P2= 3.50" |
| 3.4 | 230 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C** |
| | | | | | Unpaved Kv= 16.1 fps |
| 17.0 | 280 | Total | | | |

## Subcatchment POST-3: Post Development Area 3



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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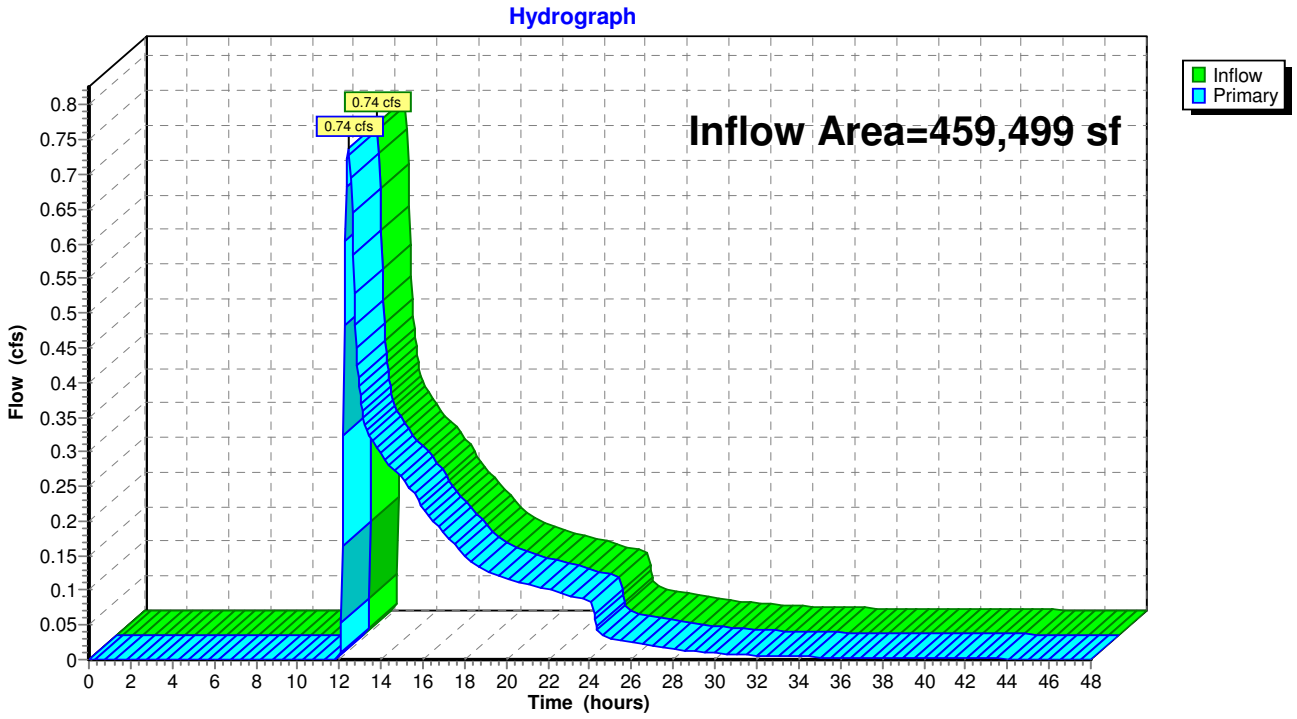
[40] Hint: Not Described (Outflow=Inflow)

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 459,499 sf, | 43.49% Impervious, | Inflow Depth > | 0.24" | for 2 YR event |
| Inflow = | 0.74 cfs @ | 12.46 hrs, | Volume= | 9,100 cf | |
| Primary = | 0.74 cfs @ | 12.46 hrs, | Volume= | 9,100 cf, | Atten= 0%, Lag= 0.0 min |

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND-1: Detention/Infiltration Basin 1

Inflow Area = 215,535 sf, 74.55% Impervious, Inflow Depth = 2.84" for 2 YR event
Inflow = 11.15 cfs @ 12.23 hrs, Volume= 50,931 cf
Outflow = 0.71 cfs @ 14.87 hrs, Volume= 50,968 cf, Atten= 94%, Lag= 158.2 min
Discarded = 0.68 cfs @ 14.87 hrs, Volume= 50,466 cf
Primary = 0.03 cfs @ 14.87 hrs, Volume= 502 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 80.93' @ 14.87 hrs Surf.Area= 28,720 sf Storage= 25,633 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 341.2 min ( 1,136.1 - 795.0 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 80.00' | 90,252 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 80.00 | 26,586 | 0 | 0 |
| 81.00 | 28,888 | 27,737 | 27,737 |
| 82.00 | 31,246 | 30,067 | 57,804 |
| 83.00 | 33,650 | 32,448 | 90,252 |

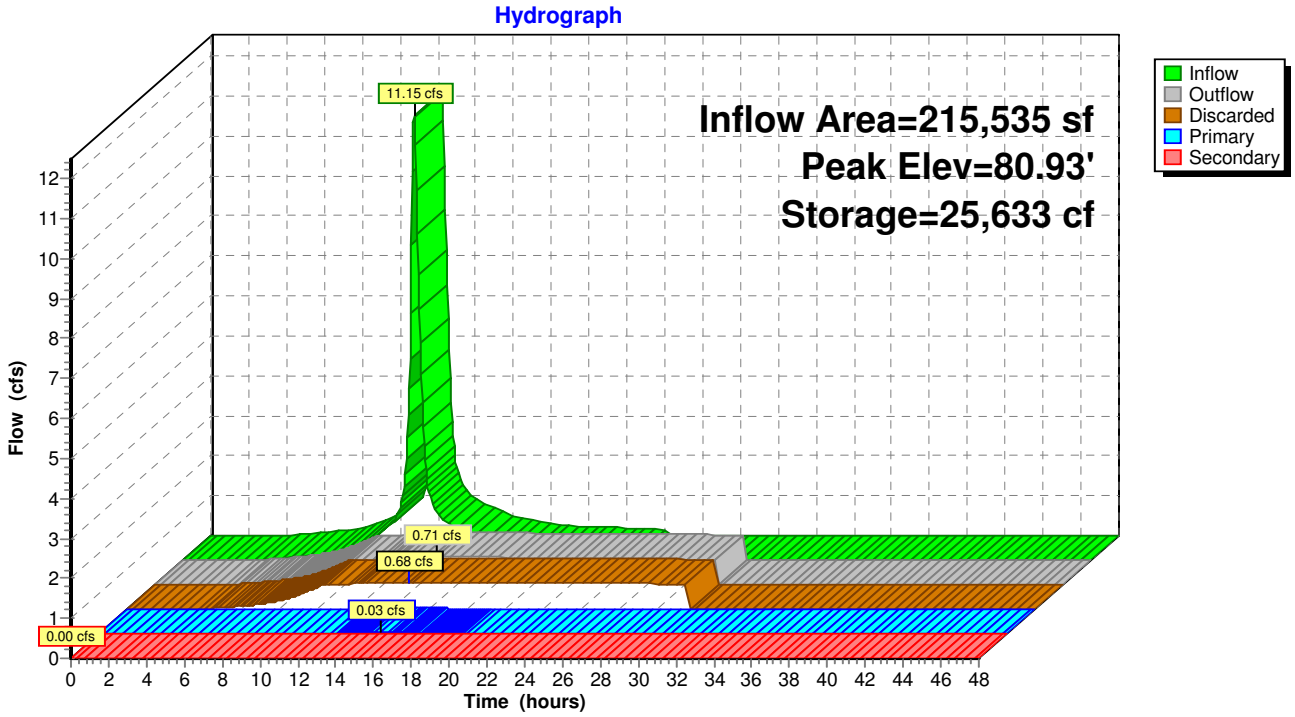
| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 80.00' | **12.0" Round Culvert**<br>L= 55.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 80.00' / 79.45' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 80.75' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 81.50' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 82.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |
| #5 | Discarded | 80.00' | **1.020 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.68 cfs @ 14.87 hrs HW=80.93' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.68 cfs)

**Primary OutFlow** Max=0.03 cfs @ 14.87 hrs HW=80.93' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.03 cfs of 2.44 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 1.47 fps)
  └**3=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-1: Detention/Infiltration Basin 1



## Summary for Pond POND-2: Wet Basin 2

Inflow Area = 39,144 sf, 45.90% Impervious, Inflow Depth = 0.85" for 2 YR event
Inflow = 0.57 cfs @ 12.25 hrs, Volume= 2,773 cf
Outflow = 0.06 cfs @ 15.39 hrs, Volume= 2,697 cf, Atten= 90%, Lag= 188.4 min
Primary = 0.06 cfs @ 15.39 hrs, Volume= 2,697 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 79.37' @ 15.39 hrs Surf.Area= 3,733 sf Storage= 1,333 cf

Plug-Flow detention time= 353.0 min calculated for 2,697 cf (97% of inflow)
Center-of-Mass det. time= 338.2 min ( 1,226.8 - 888.6 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 79.00' | 28,790 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

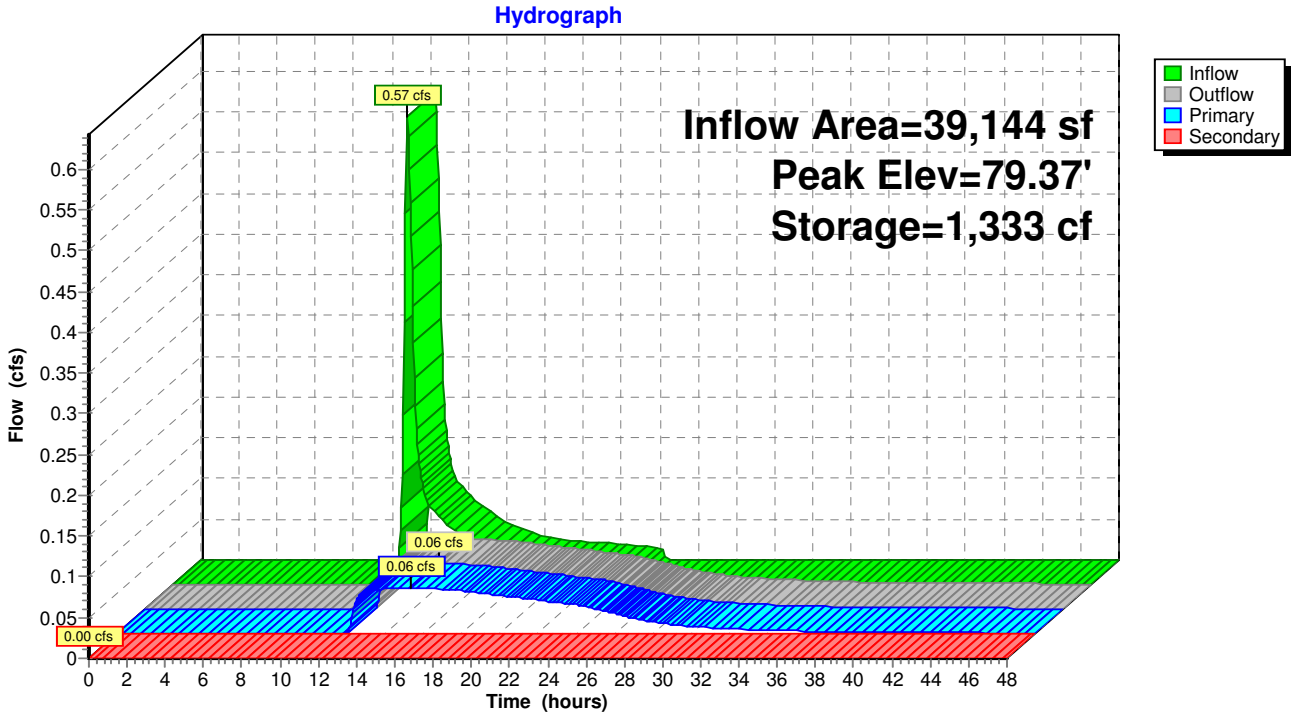
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 79.00 | 3,428 | 0 | 0 |
| 80.00 | 4,248 | 3,838 | 3,838 |
| 81.00 | 5,125 | 4,687 | 8,525 |
| 82.00 | 6,058 | 5,592 | 14,116 |
| 83.00 | 7,371 | 6,715 | 20,831 |
| 84.00 | 8,548 | 7,960 | 28,790 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 79.00' | **12.0" Round Culvert**<br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 79.00' / 77.70' S= 0.0060 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.00' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 82.00' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 83.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.06 cfs @ 15.39 hrs HW=79.37' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.06 cfs of 0.46 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.06 cfs @ 2.59 fps)
└**3=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=79.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-2: Wet Basin 2



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

**Subcatchment POST-1: Post** Runoff Area=215,535 sf 74.55% Impervious Runoff Depth=4.11"
Flow Length=325' Slope=0.0050 '/' Tc=17.6 min CN=94 Runoff=15.85 cfs 73,834 cf

**Subcatchment POST-2: Post Development** Runoff Area=39,144 sf 45.90% Impervious Runoff Depth=1.67"
Flow Length=270' Tc=15.7 min CN=67 Runoff=1.23 cfs 5,432 cf

**Subcatchment POST-3: Post** Runoff Area=204,820 sf 10.33% Impervious Runoff Depth=0.88"
Flow Length=280' Slope=0.0050 '/' Tc=17.0 min CN=55 Runoff=2.67 cfs 15,057 cf

**Pond AP-1: Off-Site Wetlands** Inflow=2.73 cfs 23,748 cf
Primary=2.73 cfs 23,748 cf

**Pond POND-1: Detention/Infiltration Basin** Peak Elev=81.47' Storage=41,445 cf Inflow=15.85 cfs 73,834 cf
Discarded=0.71 cfs 70,478 cf Primary=0.08 cfs 3,361 cf Secondary=0.00 cfs 0 cf Outflow=0.79 cfs 73,839 cf

**Pond POND-2: Wet Basin 2** Peak Elev=79.80' Storage=3,017 cf Inflow=1.23 cfs 5,432 cf
Primary=0.09 cfs 5,329 cf Secondary=0.00 cfs 0 cf Outflow=0.09 cfs 5,329 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 94,323 cf Average Runoff Depth = 2.46"**
**56.51% Pervious = 259,679 sf 43.49% Impervious = 199,820 sf**

## Summary for Subcatchment POST-1: Post Development Area 1

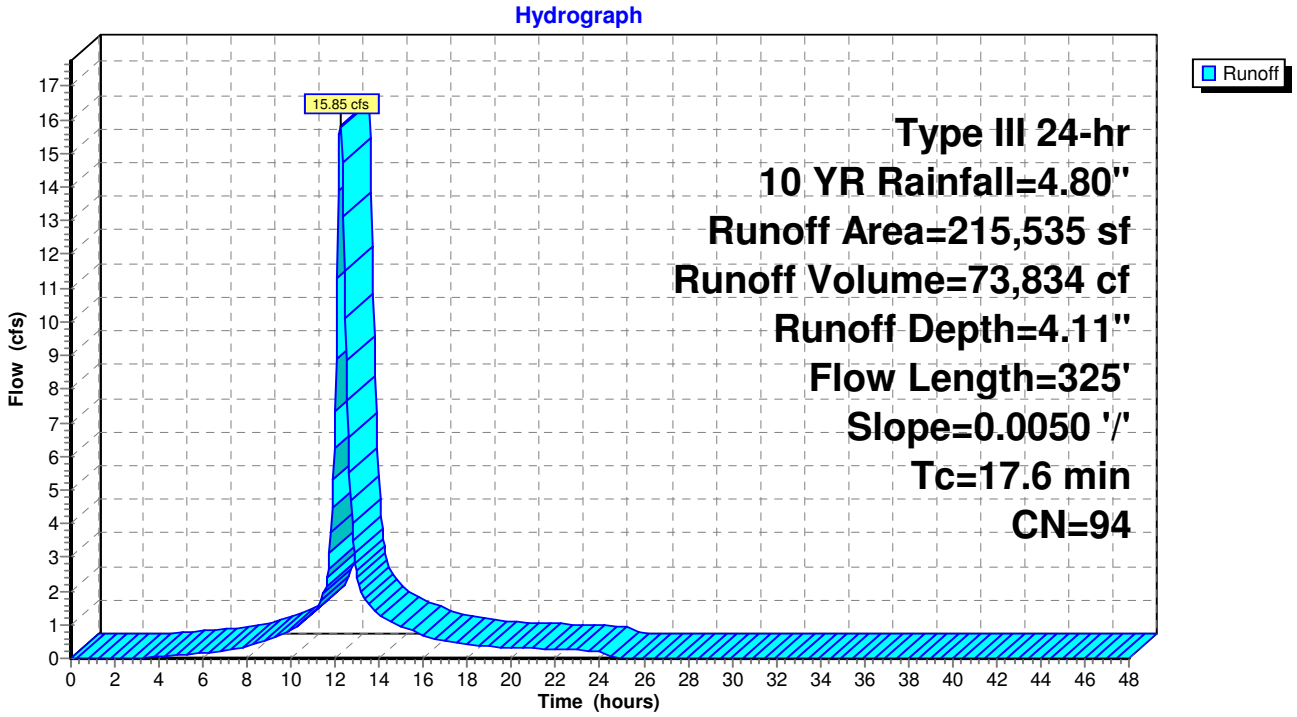
Runoff = 15.85 cfs @ 12.23 hrs, Volume= 73,834 cf, Depth= 4.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.80"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 19,280 | 98 | Roofs, HSG A |
| | 126,684 | 98 | Roofs, HSG B |
| | 6,762 | 98 | Paved parking, HSG B |
| | 7,964 | 98 | Paved parking, HSG D |
| | 18,833 | 61 | >75% Grass cover, Good, HSG B |
| | 7,124 | 80 | >75% Grass cover, Good, HSG D |
| * | 23,414 | 98 | Water Surface, 0% imp, HSG B (Basin Bottom) |
| * | 5,474 | 98 | Water Surface, 0% imp, HSG D (Basin Bottom) |
| | 215,535 | 94 | Weighted Average |
| | 54,845 | | 25.45% Pervious Area |
| | 160,690 | | 74.55% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 4.0 | 275 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 17.6 | 325 | Total | | | |

## Subcatchment POST-1: Post Development Area 1



## Summary for Subcatchment POST-2: Post Development Area 2

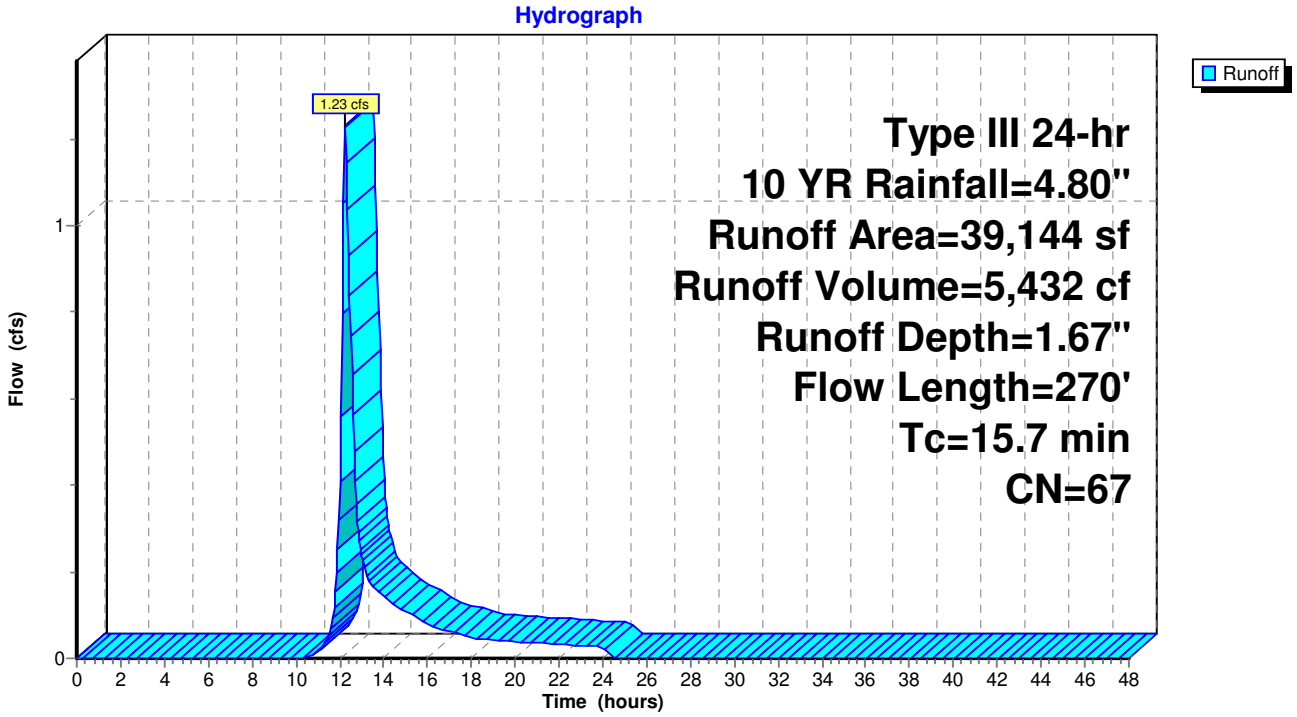
Runoff = 1.23 cfs @ 12.23 hrs, Volume= 5,432 cf, Depth= 1.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.80"

| Area (sf) | CN | Description |
|---|---|---|
| 10,044 | 98 | Paved parking, HSG A |
| 7,924 | 98 | Paved parking, HSG B |
| 20,139 | 39 | >75% Grass cover, Good, HSG A |
| 1,037 | 61 | >75% Grass cover, Good, HSG B |
| 39,144 | 67 | Weighted Average |
| 21,176 | | 54.10% Pervious Area |
| 17,968 | | 45.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 1.5 | 100 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, C-D**<br>Paved Kv= 20.3 fps |
| 0.3 | 80 | 0.0100 | 4.54 | 3.56 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 15.7 | 270 | Total | | | |

## Subcatchment POST-2: Post Development Area 2



## Summary for Subcatchment POST-3: Post Development Area 3

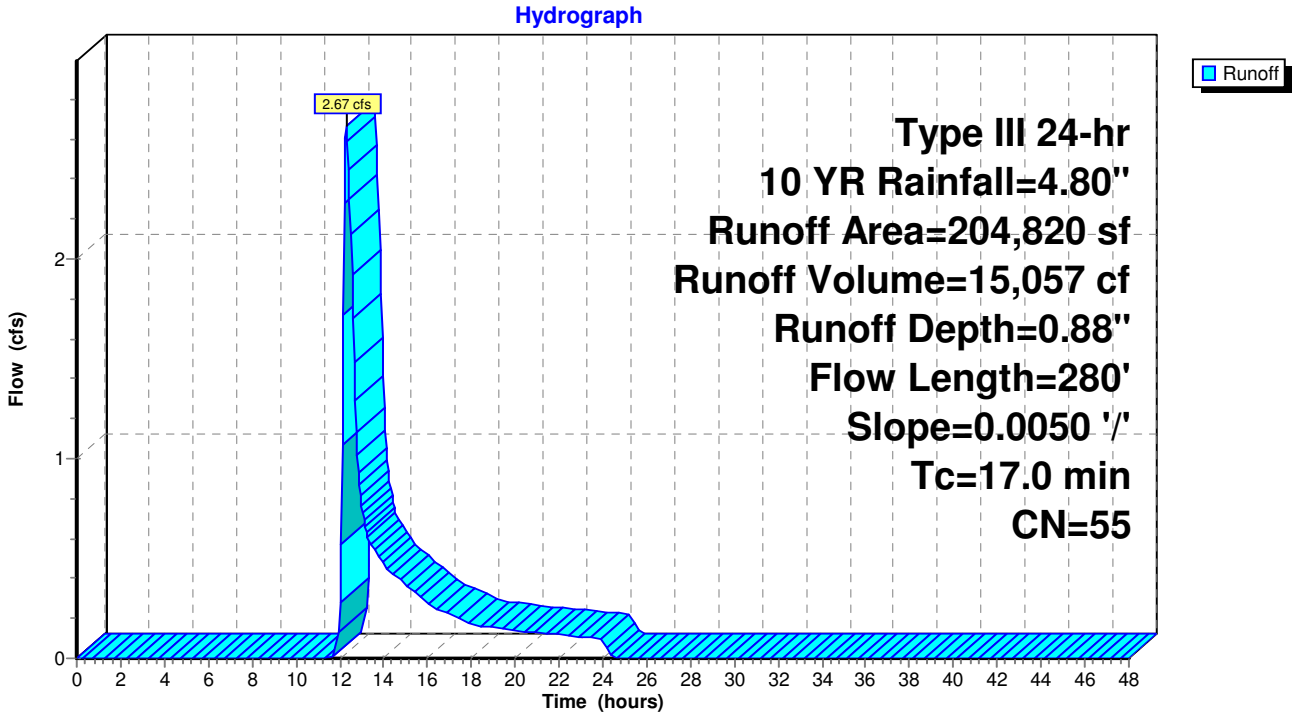
Runoff = 2.67 cfs @ 12.30 hrs, Volume= 15,057 cf, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.80"

| Area (sf) | CN | Description |
|---|---|---|
| 56,448 | 30 | Woods, Good, HSG A |
| 49,002 | 55 | Woods, Good, HSG B |
| 11,545 | 77 | Woods, Good, HSG D |
| 20,666 | 39 | >75% Grass cover, Good, HSG A |
| 29,676 | 61 | >75% Grass cover, Good, HSG B |
| 1,640 | 76 | Gravel roads, HSG A |
| 14,681 | 85 | Gravel roads, HSG B |
| 11,877 | 98 | Paved parking, HSG A |
| 8,785 | 98 | Paved parking, HSG B |
| 500 | 98 | Paved parking, HSG D |
| 204,820 | 55 | Weighted Average |
| 183,658 | | 89.67% Pervious Area |
| 21,162 | | 10.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B** |
| | | | | | Grass: Dense n= 0.240 P2= 3.50" |
| 3.4 | 230 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C** |
| | | | | | Unpaved Kv= 16.1 fps |
| 17.0 | 280 | Total | | | |

## Subcatchment POST-3: Post Development Area 3



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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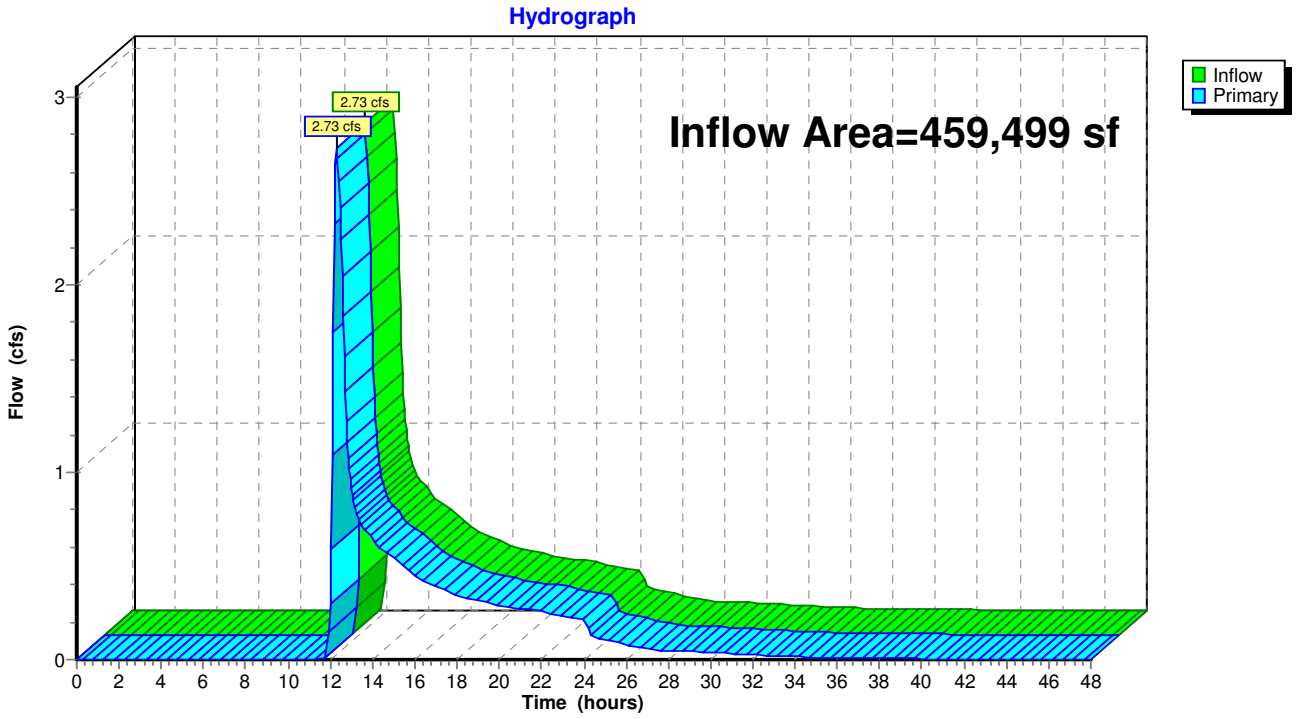
[40] Hint: Not Described (Outflow=Inflow)

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 459,499 sf, | 43.49% Impervious, | Inflow Depth > | 0.62" | for 10 YR event |
| Inflow = | 2.73 cfs @ | 12.30 hrs, | Volume= | 23,748 cf | |
| Primary = | 2.73 cfs @ | 12.30 hrs, | Volume= | 23,748 cf, | Atten= 0%, Lag= 0.0 min |

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND-1: Detention/Infiltration Basin 1

Inflow Area = 215,535 sf, 74.55% Impervious, Inflow Depth = 4.11" for 10 YR event
Inflow = 15.85 cfs @ 12.23 hrs, Volume= 73,834 cf
Outflow = 0.79 cfs @ 15.60 hrs, Volume= 73,839 cf, Atten= 95%, Lag= 202.3 min
Discarded = 0.71 cfs @ 15.60 hrs, Volume= 70,478 cf
Primary = 0.08 cfs @ 15.60 hrs, Volume= 3,361 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 81.47' @ 15.60 hrs Surf.Area= 29,986 sf Storage= 41,445 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 504.7 min ( 1,290.1 - 785.4 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 80.00' | 90,252 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 80.00 | 26,586 | 0 | 0 |
| 81.00 | 28,888 | 27,737 | 27,737 |
| 82.00 | 31,246 | 30,067 | 57,804 |
| 83.00 | 33,650 | 32,448 | 90,252 |

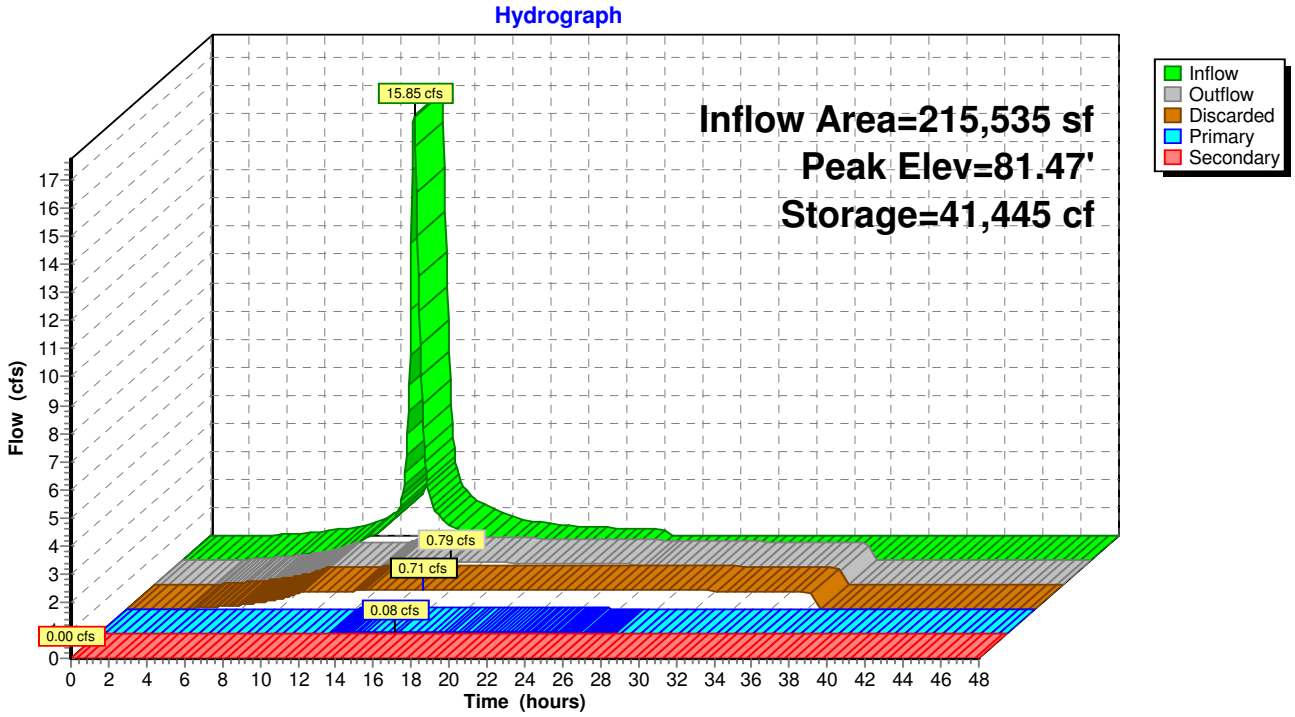
| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 80.00' | **12.0" Round Culvert**<br>L= 55.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 80.00' / 79.45' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 80.75' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 81.50' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 82.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |
| #5 | Discarded | 80.00' | **1.020 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.71 cfs @ 15.60 hrs HW=81.47' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.71 cfs)

**Primary OutFlow** Max=0.08 cfs @ 15.60 hrs HW=81.47' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.08 cfs of 3.54 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 3.83 fps)
  └**3=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-1: Detention/Infiltration Basin 1



## Summary for Pond POND-2: Wet Basin 2

Inflow Area = 39,144 sf, 45.90% Impervious, Inflow Depth = 1.67" for 10 YR event
Inflow = 1.23 cfs @ 12.23 hrs, Volume= 5,432 cf
Outflow = 0.09 cfs @ 15.68 hrs, Volume= 5,329 cf, Atten= 93%, Lag= 206.9 min
Primary = 0.09 cfs @ 15.68 hrs, Volume= 5,329 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 79.80' @ 15.68 hrs Surf.Area= 4,086 sf Storage= 3,017 cf

Plug-Flow detention time= 455.9 min calculated for 5,324 cf (98% of inflow)
Center-of-Mass det. time= 446.3 min ( 1,313.2 - 866.9 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 79.00' | 28,790 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

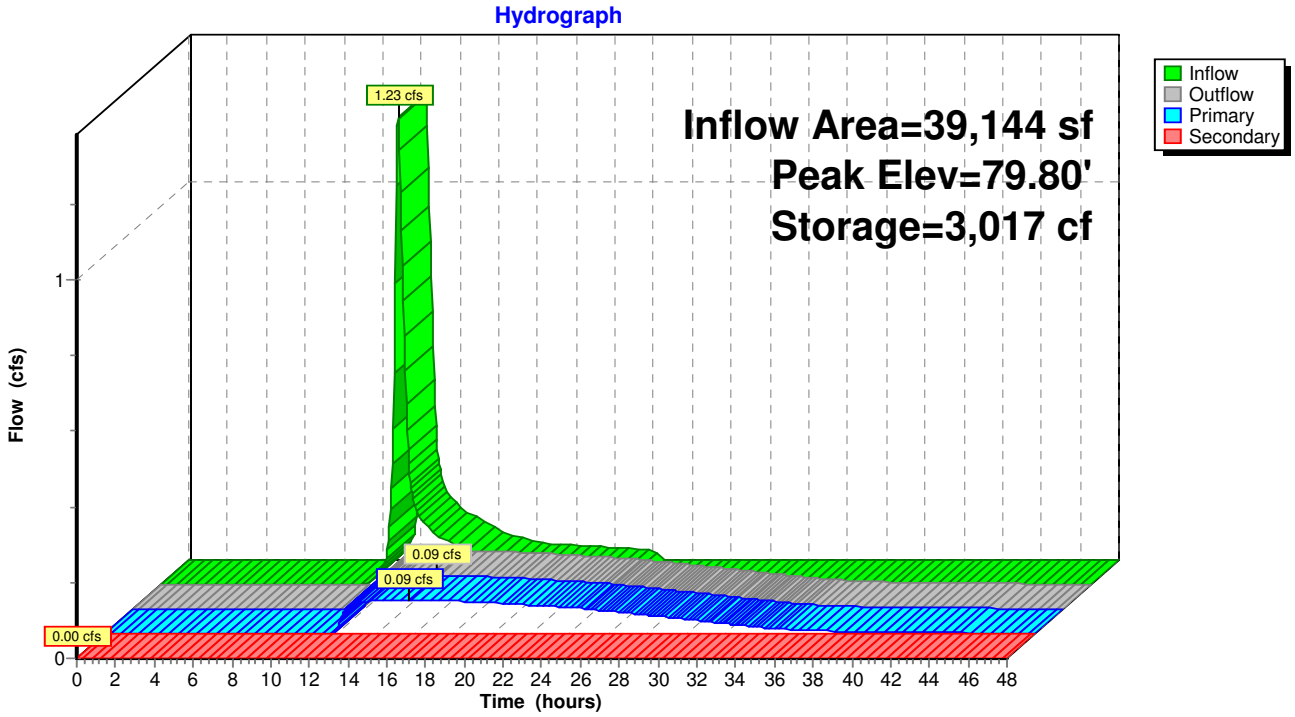
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 79.00 | 3,428 | 0 | 0 |
| 80.00 | 4,248 | 3,838 | 3,838 |
| 81.00 | 5,125 | 4,687 | 8,525 |
| 82.00 | 6,058 | 5,592 | 14,116 |
| 83.00 | 7,371 | 6,715 | 20,831 |
| 84.00 | 8,548 | 7,960 | 28,790 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 79.00' | **12.0" Round Culvert**<br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 79.00' / 77.70' S= 0.0060 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.00' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 82.00' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 83.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.09 cfs @ 15.68 hrs HW=79.80' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.09 cfs of 1.79 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 4.08 fps)
  └**3=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=79.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-2: Wet Basin 2



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

**Subcatchment POST-1: Post** Runoff Area=215,535 sf 74.55% Impervious Runoff Depth=4.90"
Flow Length=325' Slope=0.0050 '/' Tc=17.6 min CN=94 Runoff=18.72 cfs 88,023 cf

**Subcatchment POST-2: Post Development** Runoff Area=39,144 sf 45.90% Impervious Runoff Depth=2.23"
Flow Length=270' Tc=15.7 min CN=67 Runoff=1.69 cfs 7,282 cf

**Subcatchment POST-3: Post** Runoff Area=204,820 sf 10.33% Impervious Runoff Depth=1.29"
Flow Length=280' Slope=0.0050 '/' Tc=17.0 min CN=55 Runoff=4.36 cfs 22,078 cf

**Pond AP-1: Off-Site Wetlands** Inflow=4.44 cfs 41,304 cf
Primary=4.44 cfs 41,304 cf

**Pond POND-1: Detention/Infiltration Basin** Peak Elev=81.65' Storage=47,099 cf Inflow=18.72 cfs 88,023 cf
Discarded=0.72 cfs 75,973 cf Primary=0.87 cfs 12,072 cf Secondary=0.00 cfs 0 cf Outflow=1.59 cfs 88,045 cf

**Pond POND-2: Wet Basin 2** Peak Elev=80.10' Storage=4,284 cf Inflow=1.69 cfs 7,282 cf
Primary=0.11 cfs 7,153 cf Secondary=0.00 cfs 0 cf Outflow=0.11 cfs 7,153 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 117,383 cf Average Runoff Depth = 3.07"**
**56.51% Pervious = 259,679 sf 43.49% Impervious = 199,820 sf**

## Summary for Subcatchment POST-1: Post Development Area 1

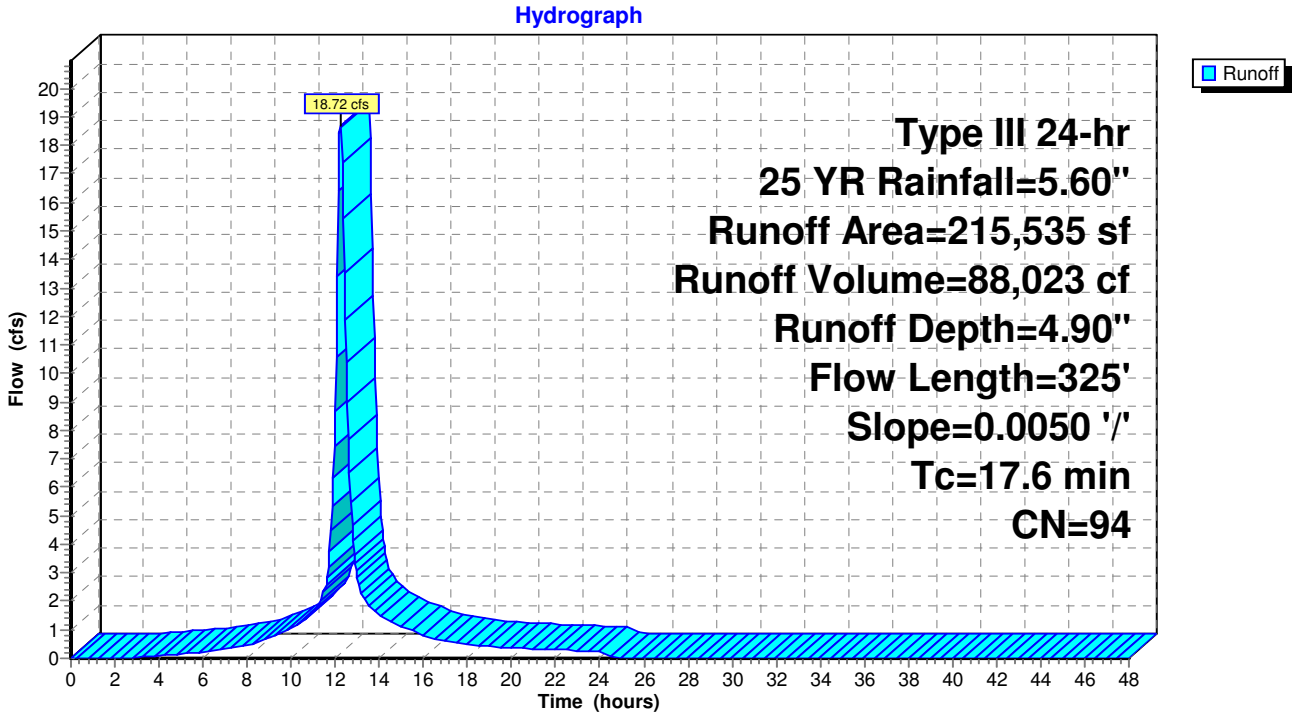
Runoff = 18.72 cfs @ 12.23 hrs, Volume= 88,023 cf, Depth= 4.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.60"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 19,280 | 98 | Roofs, HSG A |
| | 126,684 | 98 | Roofs, HSG B |
| | 6,762 | 98 | Paved parking, HSG B |
| | 7,964 | 98 | Paved parking, HSG D |
| | 18,833 | 61 | >75% Grass cover, Good, HSG B |
| | 7,124 | 80 | >75% Grass cover, Good, HSG D |
| * | 23,414 | 98 | Water Surface, 0% imp, HSG B (Basin Bottom) |
| * | 5,474 | 98 | Water Surface, 0% imp, HSG D (Basin Bottom) |
| | 215,535 | 94 | Weighted Average |
| | 54,845 | | 25.45% Pervious Area |
| | 160,690 | | 74.55% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 4.0 | 275 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 17.6 | 325 | Total | | | |

## Subcatchment POST-1: Post Development Area 1



## Summary for Subcatchment POST-2: Post Development Area 2

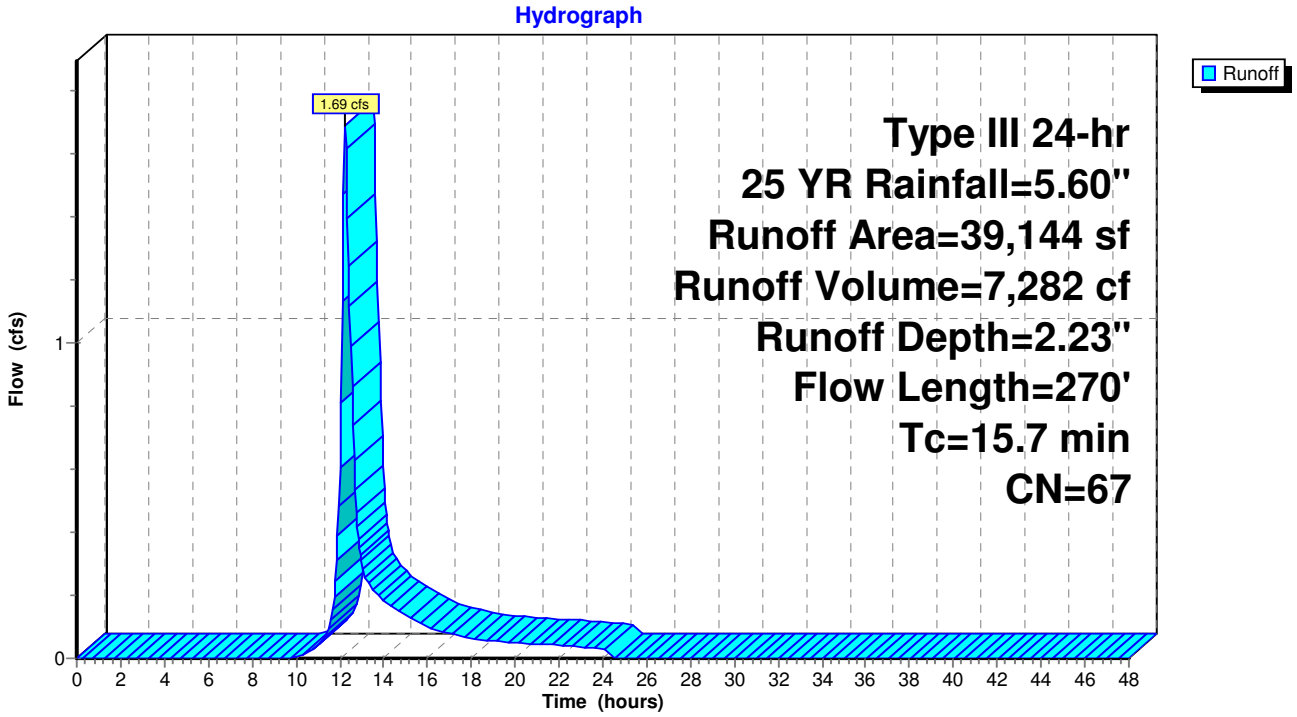
Runoff = 1.69 cfs @ 12.23 hrs, Volume= 7,282 cf, Depth= 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.60"

| Area (sf) | CN | Description |
|---|---|---|
| 10,044 | 98 | Paved parking, HSG A |
| 7,924 | 98 | Paved parking, HSG B |
| 20,139 | 39 | >75% Grass cover, Good, HSG A |
| 1,037 | 61 | >75% Grass cover, Good, HSG B |
| 39,144 | 67 | Weighted Average |
| 21,176 | | 54.10% Pervious Area |
| 17,968 | | 45.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 1.5 | 100 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, C-D**<br>Paved Kv= 20.3 fps |
| 0.3 | 80 | 0.0100 | 4.54 | 3.56 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 15.7 | 270 | Total | | | |

## Subcatchment POST-2: Post Development Area 2



## Summary for Subcatchment POST-3: Post Development Area 3

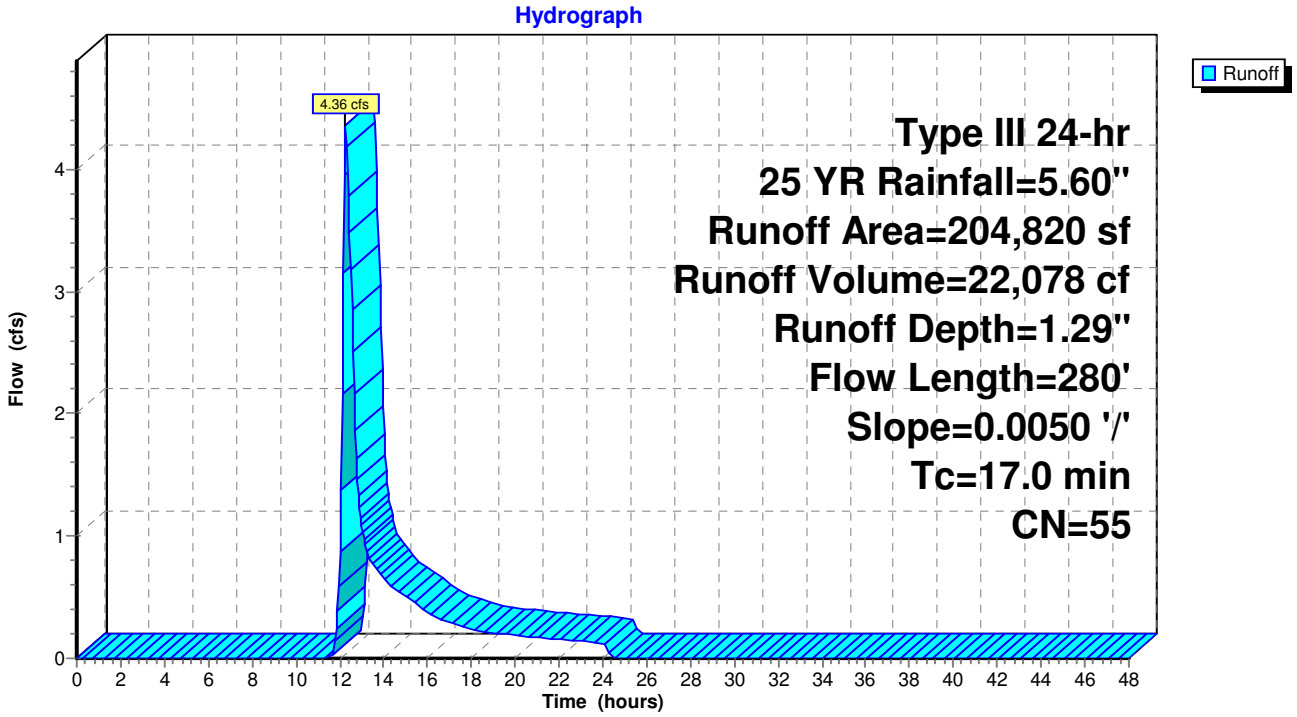
Runoff = 4.36 cfs @ 12.27 hrs, Volume= 22,078 cf, Depth= 1.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=5.60"

| Area (sf) | CN | Description |
|---|---|---|
| 56,448 | 30 | Woods, Good, HSG A |
| 49,002 | 55 | Woods, Good, HSG B |
| 11,545 | 77 | Woods, Good, HSG D |
| 20,666 | 39 | >75% Grass cover, Good, HSG A |
| 29,676 | 61 | >75% Grass cover, Good, HSG B |
| 1,640 | 76 | Gravel roads, HSG A |
| 14,681 | 85 | Gravel roads, HSG B |
| 11,877 | 98 | Paved parking, HSG A |
| 8,785 | 98 | Paved parking, HSG B |
| 500 | 98 | Paved parking, HSG D |
| 204,820 | 55 | Weighted Average |
| 183,658 | | 89.67% Pervious Area |
| 21,162 | | 10.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B** |
| | | | | | Grass: Dense n= 0.240 P2= 3.50" |
| 3.4 | 230 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C** |
| | | | | | Unpaved Kv= 16.1 fps |
| 17.0 | 280 | Total | | | |

## Subcatchment POST-3: Post Development Area 3



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

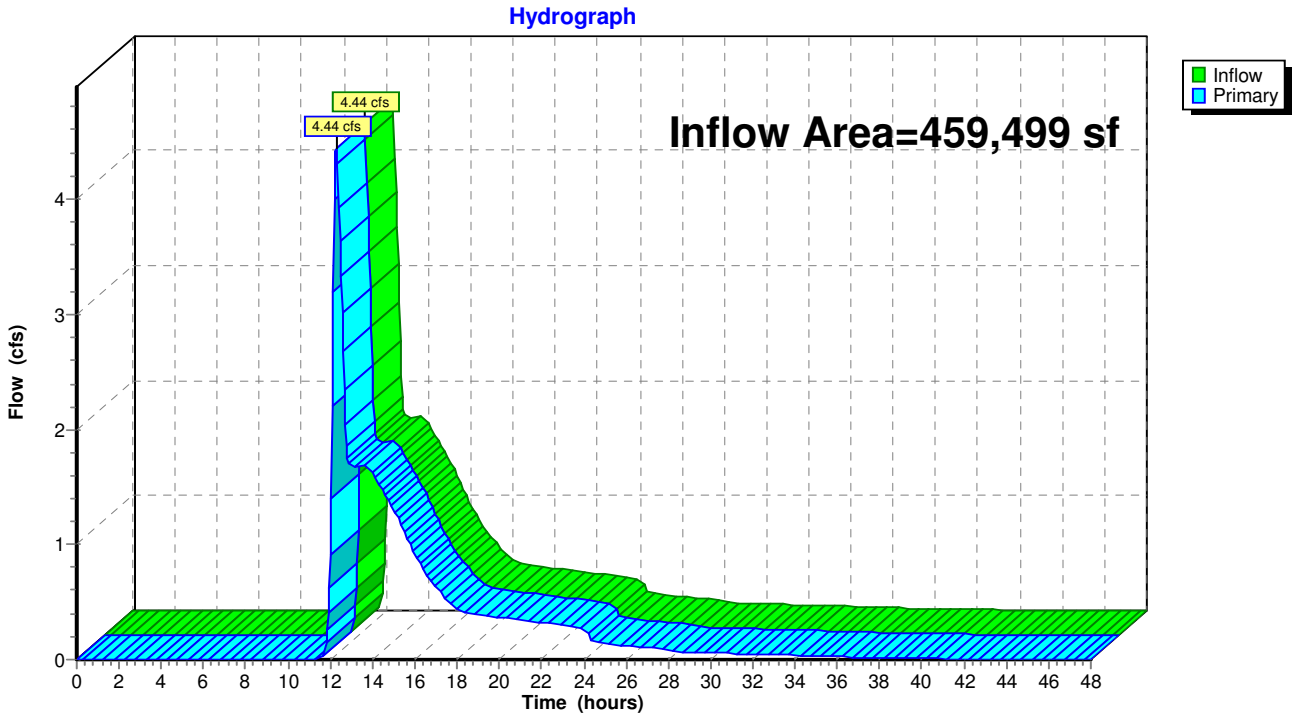
---

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

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 459,499 sf, | 43.49% Impervious, | Inflow Depth > | 1.08" | for 25 YR event |
| Inflow = | 4.44 cfs @ | 12.28 hrs, | Volume= | 41,304 cf | |
| Primary = | 4.44 cfs @ | 12.28 hrs, | Volume= | 41,304 cf, | Atten= 0%, Lag= 0.0 min |

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND-1: Detention/Infiltration Basin 1

Inflow Area = 215,535 sf, 74.55% Impervious, Inflow Depth = 4.90" for 25 YR event
Inflow = 18.72 cfs @ 12.23 hrs, Volume= 88,023 cf
Outflow = 1.59 cfs @ 13.90 hrs, Volume= 88,045 cf, Atten= 92%, Lag= 100.3 min
Discarded = 0.72 cfs @ 13.90 hrs, Volume= 75,973 cf
Primary = 0.87 cfs @ 13.90 hrs, Volume= 12,072 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 81.65' @ 13.90 hrs Surf.Area= 30,427 sf Storage= 47,099 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 494.6 min ( 1,275.7 - 781.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 80.00' | 90,252 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 80.00 | 26,586 | 0 | 0 |
| 81.00 | 28,888 | 27,737 | 27,737 |
| 82.00 | 31,246 | 30,067 | 57,804 |
| 83.00 | 33,650 | 32,448 | 90,252 |

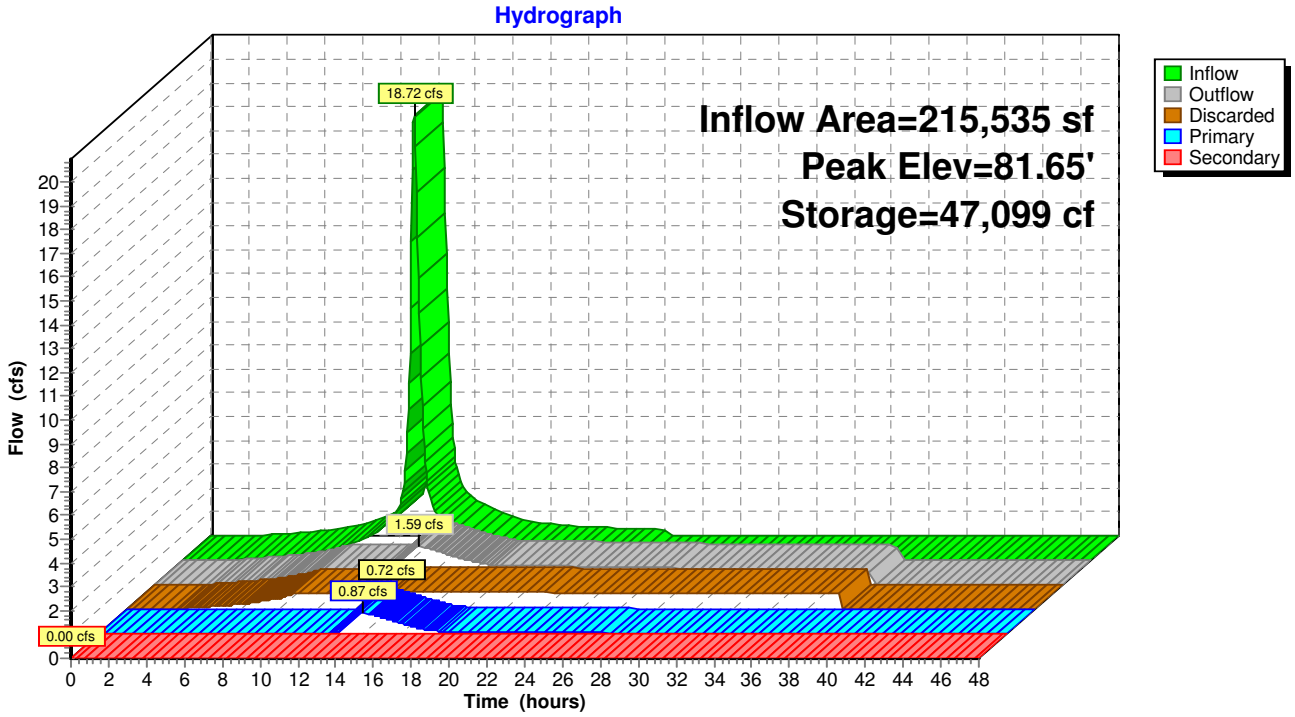
| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 80.00' | **12.0" Round Culvert**<br>L= 55.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 80.00' / 79.45' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 80.75' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 81.50' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 82.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |
| #5 | Discarded | 80.00' | **1.020 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.72 cfs @ 13.90 hrs HW=81.65' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.72 cfs)

**Primary OutFlow** Max=0.87 cfs @ 13.90 hrs HW=81.65' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.87 cfs of 3.85 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.10 cfs @ 4.36 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.78 cfs @ 1.28 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-1: Detention/Infiltration Basin 1



## Summary for Pond POND-2: Wet Basin 2

Inflow Area = 39,144 sf, 45.90% Impervious, Inflow Depth = 2.23" for 25 YR event
Inflow = 1.69 cfs @ 12.23 hrs, Volume= 7,282 cf
Outflow = 0.11 cfs @ 15.87 hrs, Volume= 7,153 cf, Atten= 94%, Lag= 218.3 min
Primary = 0.11 cfs @ 15.87 hrs, Volume= 7,153 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 80.10' @ 15.87 hrs Surf.Area= 4,339 sf Storage= 4,284 cf

Plug-Flow detention time= 526.2 min calculated for 7,146 cf (98% of inflow)
Center-of-Mass det. time= 517.0 min ( 1,375.1 - 858.1 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 79.00' | 28,790 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

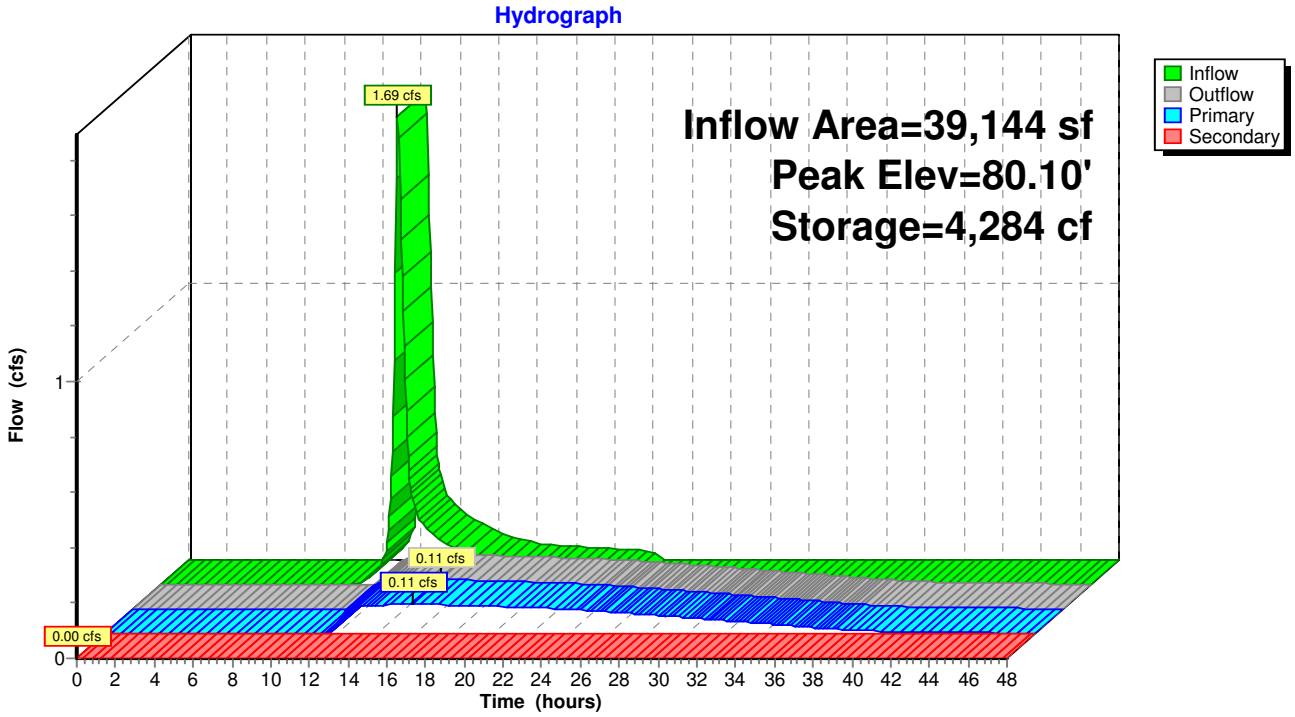
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 79.00 | 3,428 | 0 | 0 |
| 80.00 | 4,248 | 3,838 | 3,838 |
| 81.00 | 5,125 | 4,687 | 8,525 |
| 82.00 | 6,058 | 5,592 | 14,116 |
| 83.00 | 7,371 | 6,715 | 20,831 |
| 84.00 | 8,548 | 7,960 | 28,790 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 79.00' | **12.0" Round Culvert**<br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 79.00' / 77.70' S= 0.0060 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.00' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 82.00' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 83.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.11 cfs @ 15.87 hrs HW=80.10' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.11 cfs of 2.71 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 4.86 fps)
  └**3=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=79.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-2: Wet Basin 2



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

**Subcatchment POST-1: Post** Runoff Area=215,535 sf 74.55% Impervious Runoff Depth=6.29"
Flow Length=325' Slope=0.0050 '/' Tc=17.6 min CN=94 Runoff=23.70 cfs 112,946 cf

**Subcatchment POST-2: Post Development** Runoff Area=39,144 sf 45.90% Impervious Runoff Depth=3.31"
Flow Length=270' Tc=15.7 min CN=67 Runoff=2.56 cfs 10,787 cf

**Subcatchment POST-3: Post** Runoff Area=204,820 sf 10.33% Impervious Runoff Depth=2.12"
Flow Length=280' Slope=0.0050 '/' Tc=17.0 min CN=55 Runoff=7.78 cfs 36,251 cf

**Pond AP-1: Off-Site Wetlands** Inflow=7.94 cfs 78,952 cf
Primary=7.94 cfs 78,952 cf

**Pond POND-1: Detention/Infiltration** Peak Elev=81.92' Storage=55,418 cf Inflow=23.70 cfs 112,946 cf
Discarded=0.73 cfs 80,832 cf Primary=3.64 cfs 32,131 cf Secondary=0.00 cfs 0 cf Outflow=4.37 cfs 112,962 cf

**Pond POND-2: Wet Basin 2** Peak Elev=80.65' Storage=6,796 cf Inflow=2.56 cfs 10,787 cf
Primary=0.13 cfs 10,571 cf Secondary=0.00 cfs 0 cf Outflow=0.13 cfs 10,571 cf

**Total Runoff Area = 459,499 sf Runoff Volume = 159,984 cf Average Runoff Depth = 4.18"**
**56.51% Pervious = 259,679 sf 43.49% Impervious = 199,820 sf**

## Summary for Subcatchment POST-1: Post Development Area 1

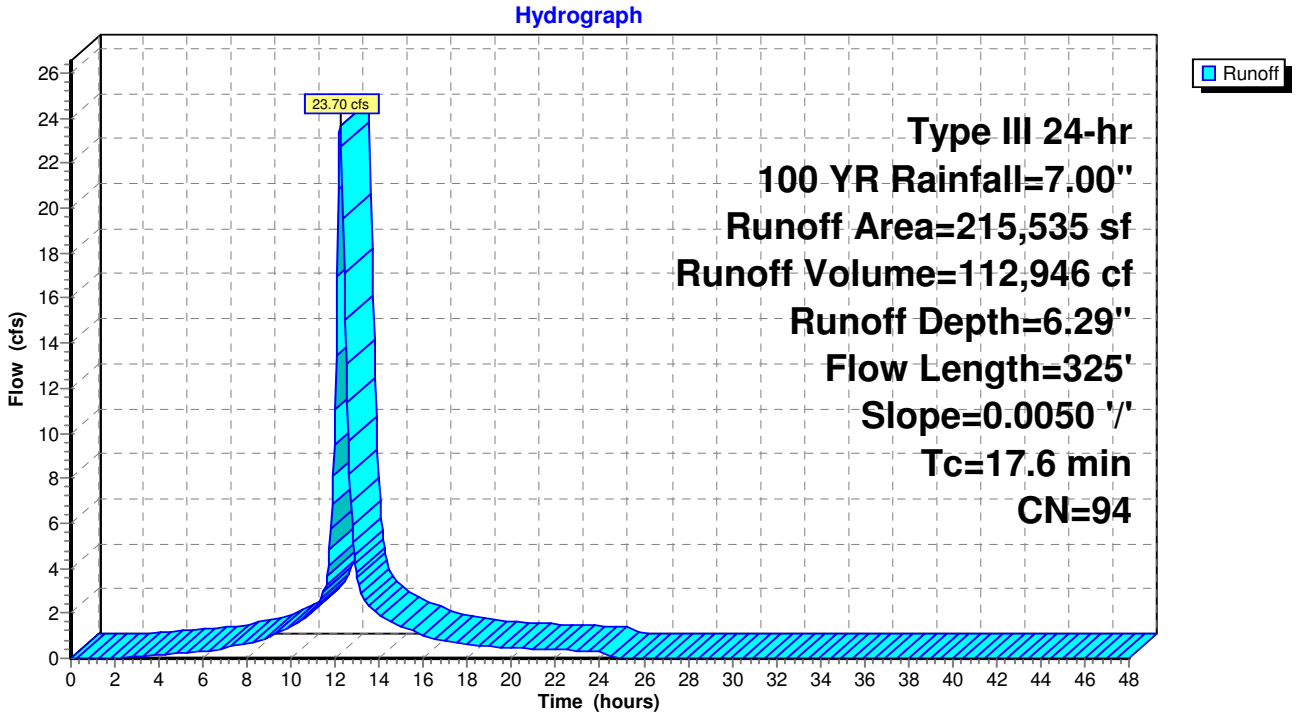
Runoff = 23.70 cfs @ 12.23 hrs, Volume= 112,946 cf, Depth= 6.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

| | Area (sf) | CN | Description |
|---|---|---|---|
| | 19,280 | 98 | Roofs, HSG A |
| | 126,684 | 98 | Roofs, HSG B |
| | 6,762 | 98 | Paved parking, HSG B |
| | 7,964 | 98 | Paved parking, HSG D |
| | 18,833 | 61 | >75% Grass cover, Good, HSG B |
| | 7,124 | 80 | >75% Grass cover, Good, HSG D |
| * | 23,414 | 98 | Water Surface, 0% imp, HSG B (Basin Bottom) |
| * | 5,474 | 98 | Water Surface, 0% imp, HSG D (Basin Bottom) |
| | 215,535 | 94 | Weighted Average |
| | 54,845 | | 25.45% Pervious Area |
| | 160,690 | | 74.55% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 4.0 | 275 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 17.6 | 325 | Total | | | |

## Subcatchment POST-1: Post Development Area 1



## Summary for Subcatchment POST-2: Post Development Area 2

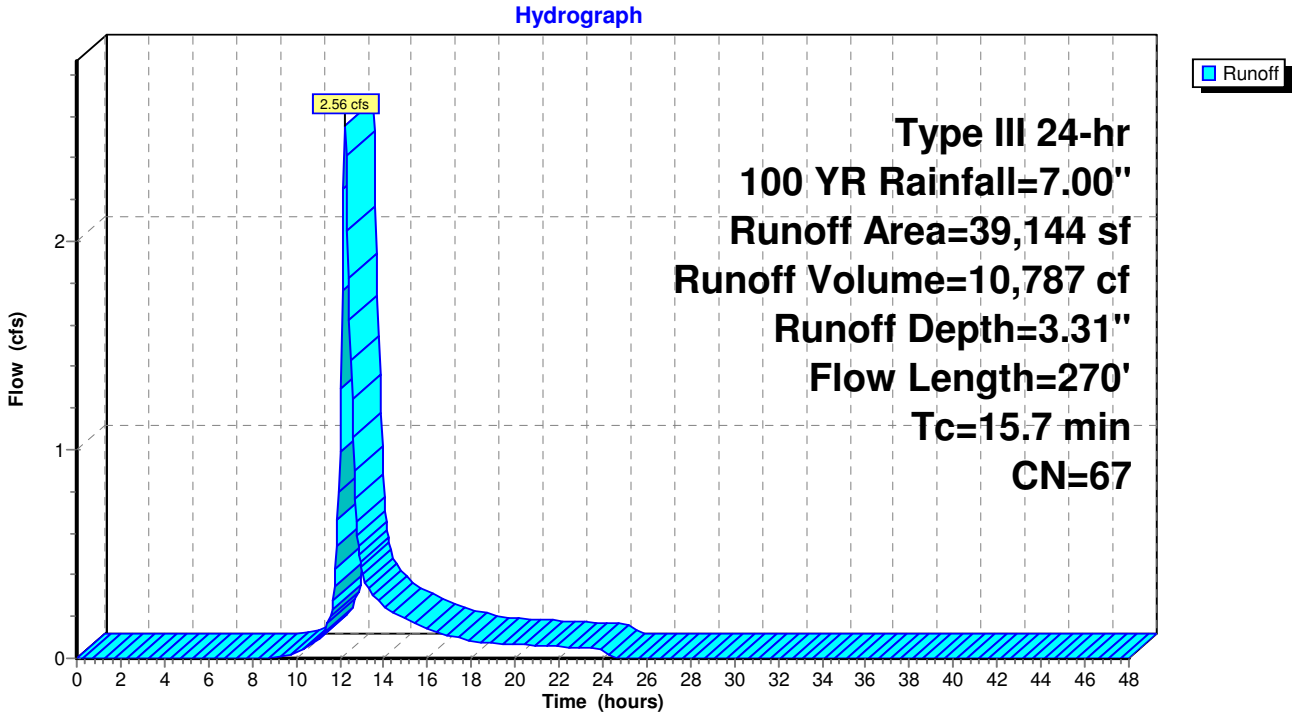
Runoff = 2.56 cfs @ 12.22 hrs, Volume= 10,787 cf, Depth= 3.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

| Area (sf) | CN | Description |
|---|---|---|
| 10,044 | 98 | Paved parking, HSG A |
| 7,924 | 98 | Paved parking, HSG B |
| 20,139 | 39 | >75% Grass cover, Good, HSG A |
| 1,037 | 61 | >75% Grass cover, Good, HSG B |
| 39,144 | 67 | Weighted Average |
| 21,176 | | 54.10% Pervious Area |
| 17,968 | | 45.90% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B**<br>Grass: Dense n= 0.240 P2= 3.50" |
| 1.5 | 100 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C**<br>Unpaved Kv= 16.1 fps |
| 0.3 | 40 | 0.0100 | 2.03 | | **Shallow Concentrated Flow, C-D**<br>Paved Kv= 20.3 fps |
| 0.3 | 80 | 0.0100 | 4.54 | 3.56 | **Pipe Channel, D-E**<br>12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25'<br>n= 0.013 Corrugated PE, smooth interior |
| 15.7 | 270 | Total | | | |

## Subcatchment POST-2: Post Development Area 2



## Summary for Subcatchment POST-3: Post Development Area 3

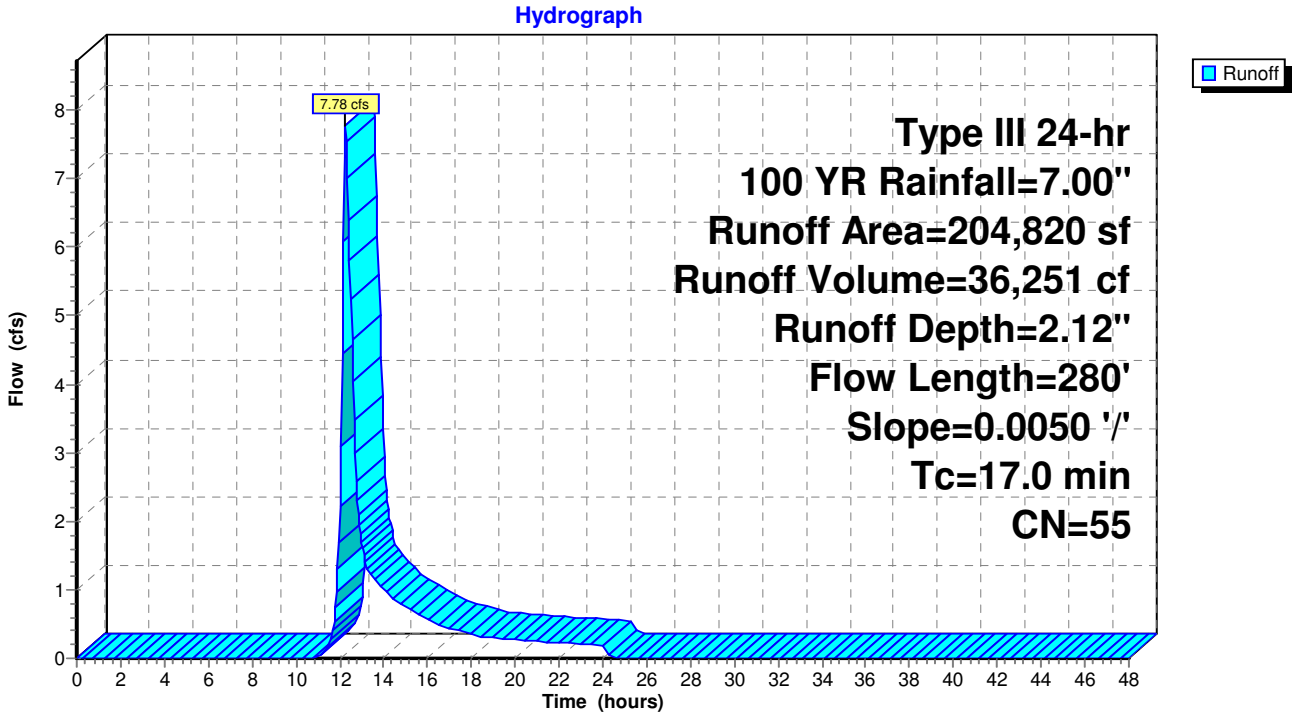
Runoff = 7.78 cfs @ 12.26 hrs, Volume= 36,251 cf, Depth= 2.12"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=7.00"

| Area (sf) | CN | Description |
|---|---|---|
| 56,448 | 30 | Woods, Good, HSG A |
| 49,002 | 55 | Woods, Good, HSG B |
| 11,545 | 77 | Woods, Good, HSG D |
| 20,666 | 39 | >75% Grass cover, Good, HSG A |
| 29,676 | 61 | >75% Grass cover, Good, HSG B |
| 1,640 | 76 | Gravel roads, HSG A |
| 14,681 | 85 | Gravel roads, HSG B |
| 11,877 | 98 | Paved parking, HSG A |
| 8,785 | 98 | Paved parking, HSG B |
| 500 | 98 | Paved parking, HSG D |
| 204,820 | 55 | Weighted Average |
| 183,658 | | 89.67% Pervious Area |
| 21,162 | | 10.33% Impervious Area |

| Tc (min) | Length (feet) | Slope (ft/ft) | Velocity (ft/sec) | Capacity (cfs) | Description |
|---|---|---|---|---|---|
| 13.6 | 50 | 0.0050 | 0.06 | | **Sheet Flow, A-B** |
| | | | | | Grass: Dense n= 0.240 P2= 3.50" |
| 3.4 | 230 | 0.0050 | 1.14 | | **Shallow Concentrated Flow, B-C** |
| | | | | | Unpaved Kv= 16.1 fps |
| 17.0 | 280 | Total | | | |

## Subcatchment POST-3: Post Development Area 3



## Summary for Pond AP-1: Off-Site Wetlands

Analysis Point 1 is taken at the boundary of the wetlands surrounding the property which contribute flow to the cross culverts under Samuel Barnet Boulevard.

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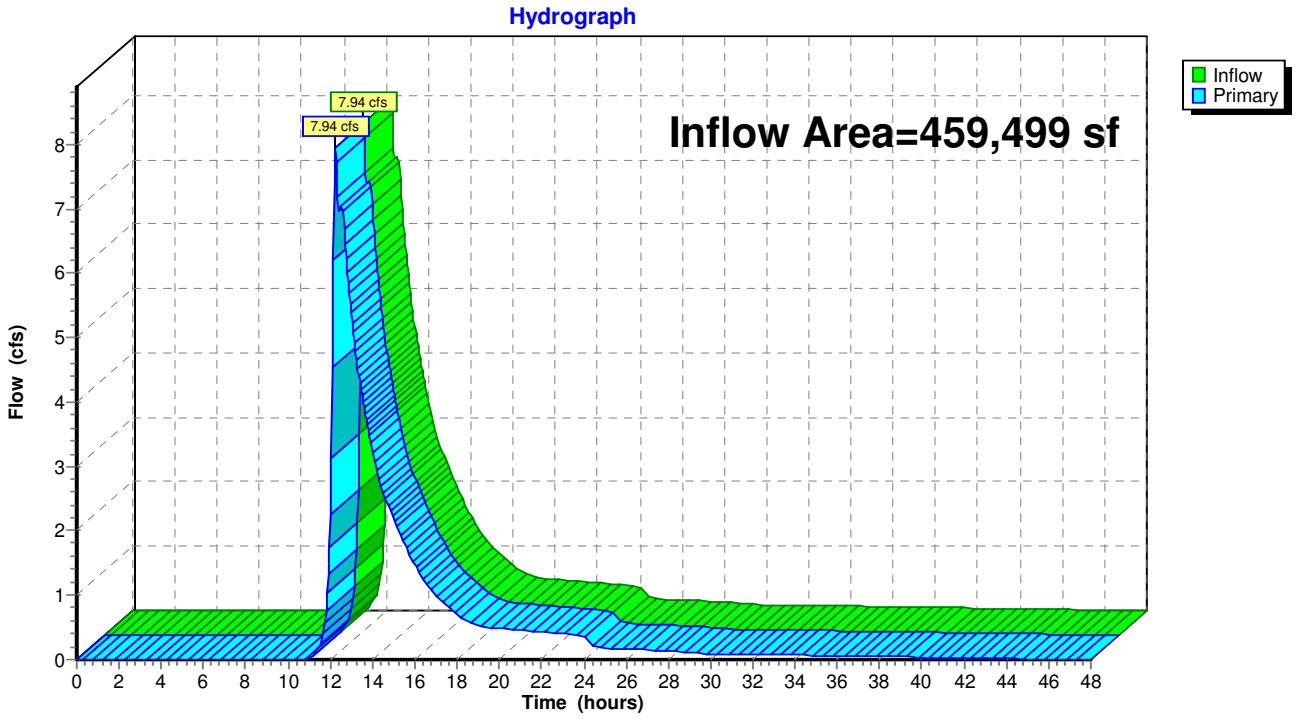
[40] Hint: Not Described (Outflow=Inflow)

| | | | | | |
|---|---|---|---|---|---|
| Inflow Area = | 459,499 sf, | 43.49% Impervious, | Inflow Depth > | 2.06" | for 100 YR event |
| Inflow = | 7.94 cfs @ | 12.26 hrs, | Volume= | 78,952 cf | |
| Primary = | 7.94 cfs @ | 12.26 hrs, | Volume= | 78,952 cf, | Atten= 0%, Lag= 0.0 min |

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

### Pond AP-1: Off-Site Wetlands



## Summary for Pond POND-1: Detention/Infiltration Basin 1

Inflow Area = 215,535 sf, 74.55% Impervious, Inflow Depth = 6.29" for 100 YR event
Inflow = 23.70 cfs @ 12.23 hrs, Volume= 112,946 cf
Outflow = 4.37 cfs @ 12.88 hrs, Volume= 112,962 cf, Atten= 82%, Lag= 38.8 min
Discarded = 0.73 cfs @ 12.88 hrs, Volume= 80,832 cf
Primary = 3.64 cfs @ 12.88 hrs, Volume= 32,131 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 81.92' @ 12.88 hrs Surf.Area= 31,065 sf Storage= 55,418 cf

Plug-Flow detention time= 426.0 min calculated for 112,845 cf (100% of inflow)
Center-of-Mass det. time= 426.6 min ( 1,201.9 - 775.3 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 80.00' | 90,252 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 80.00 | 26,586 | 0 | 0 |
| 81.00 | 28,888 | 27,737 | 27,737 |
| 82.00 | 31,246 | 30,067 | 57,804 |
| 83.00 | 33,650 | 32,448 | 90,252 |

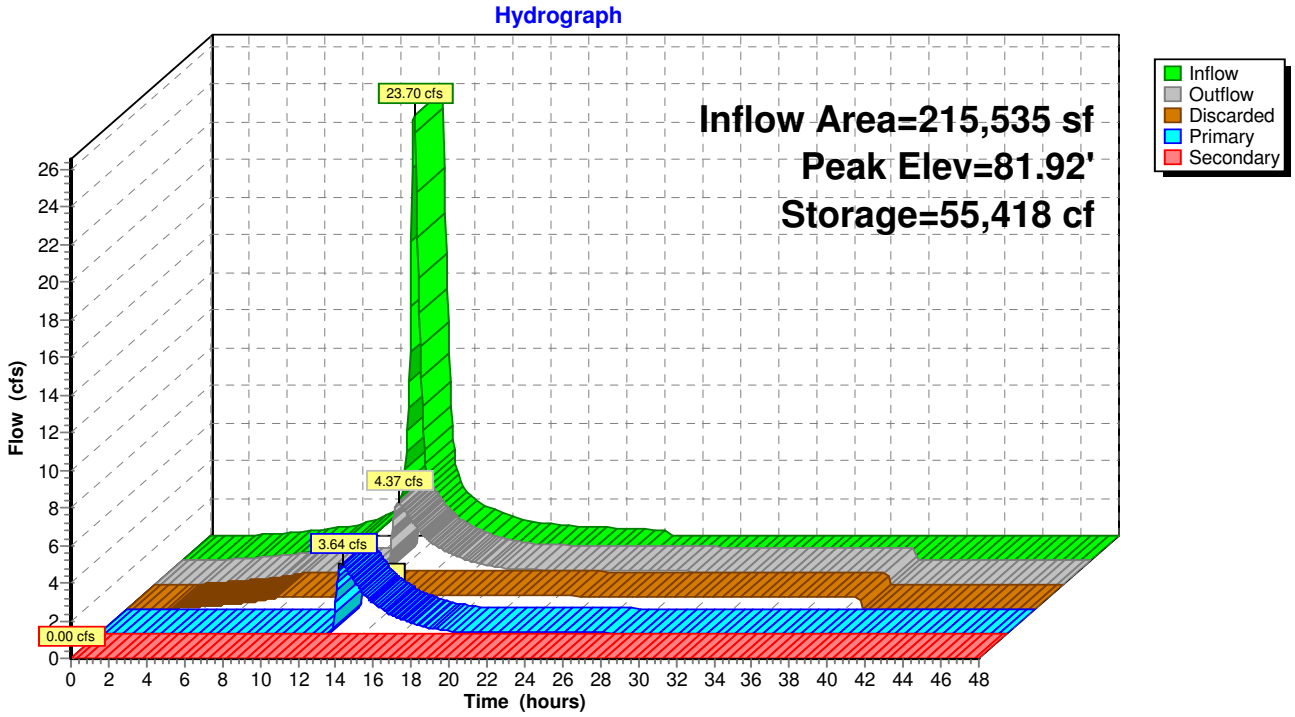
| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 80.00' | **12.0" Round Culvert**<br>L= 55.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 80.00' / 79.45' S= 0.0100 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 80.75' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 81.50' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 82.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |
| #5 | Discarded | 80.00' | **1.020 in/hr Exfiltration over Surface area** |

**Discarded OutFlow** Max=0.73 cfs @ 12.88 hrs HW=81.92' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.73 cfs)

**Primary OutFlow** Max=3.63 cfs @ 12.88 hrs HW=81.92' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.63 cfs of 4.26 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.11 cfs @ 5.03 fps)
  └**3=Sharp-Crested Rectangular Weir** (Weir Controls 3.52 cfs @ 2.13 fps)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=80.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-1: Detention/Infiltration Basin 1



## Summary for Pond POND-2: Wet Basin 2

Inflow Area = 39,144 sf, 45.90% Impervious, Inflow Depth = 3.31" for 100 YR event
Inflow = 2.56 cfs @ 12.22 hrs, Volume= 10,787 cf
Outflow = 0.13 cfs @ 16.15 hrs, Volume= 10,571 cf, Atten= 95%, Lag= 235.4 min
Primary = 0.13 cfs @ 16.15 hrs, Volume= 10,571 cf
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 80.65' @ 16.15 hrs Surf.Area= 4,820 sf Storage= 6,796 cf

Plug-Flow detention time= 645.1 min calculated for 10,560 cf (98% of inflow)
Center-of-Mass det. time= 634.4 min ( 1,480.9 - 846.5 )

| Volume | Invert | Avail.Storage | Storage Description |
|---|---|---|---|
| #1 | 79.00' | 28,790 cf | **Custom Stage Data (Prismatic)** Listed below (Recalc) |

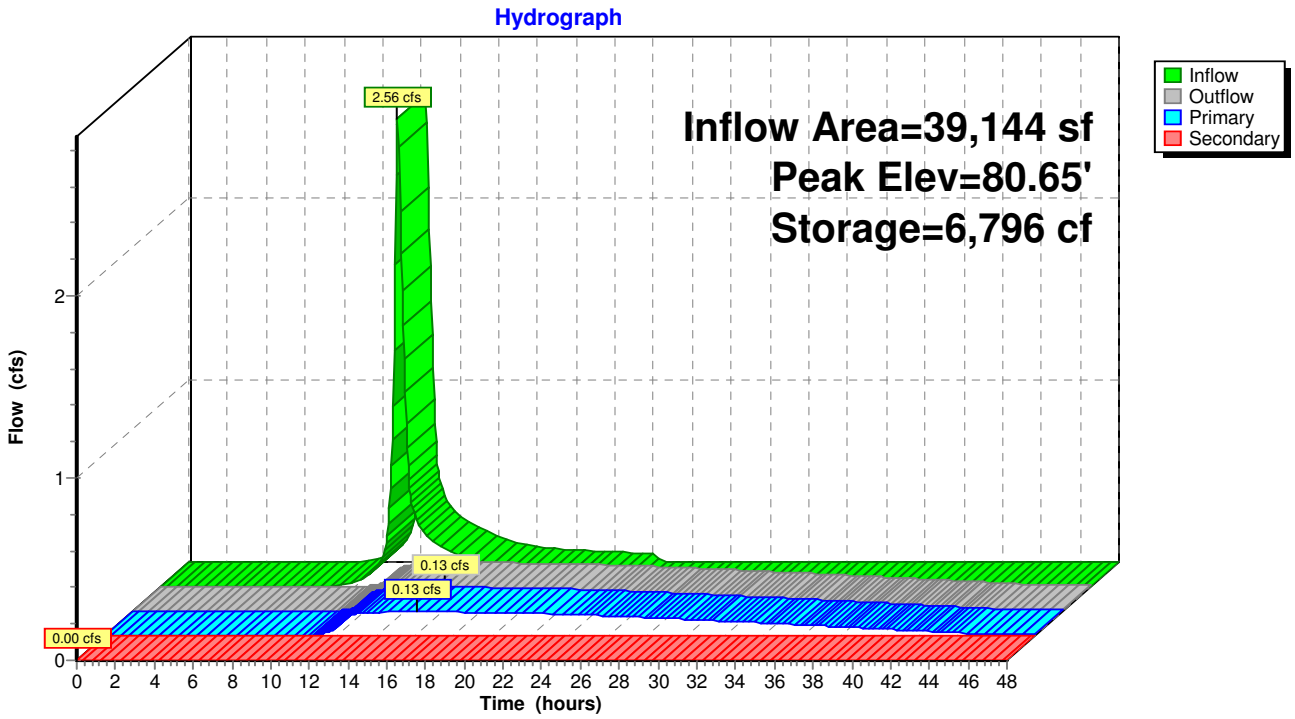
| Elevation (feet) | Surf.Area (sq-ft) | Inc.Store (cubic-feet) | Cum.Store (cubic-feet) |
|---|---|---|---|
| 79.00 | 3,428 | 0 | 0 |
| 80.00 | 4,248 | 3,838 | 3,838 |
| 81.00 | 5,125 | 4,687 | 8,525 |
| 82.00 | 6,058 | 5,592 | 14,116 |
| 83.00 | 7,371 | 6,715 | 20,831 |
| 84.00 | 8,548 | 7,960 | 28,790 |

| Device | Routing | Invert | Outlet Devices |
|---|---|---|---|
| #1 | Primary | 79.00' | **12.0" Round Culvert**<br>L= 215.0' CPP, square edge headwall, Ke= 0.500<br>Inlet / Outlet Invert= 79.00' / 77.70' S= 0.0060 '/' Cc= 0.900<br>n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf |
| #2 | Device 1 | 79.00' | **2.0" Vert. Orifice/Grate** C= 0.600 |
| #3 | Device 1 | 82.00' | **4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) |
| #4 | Secondary | 83.00' | **15.0' long x 10.0' breadth Broad-Crested Rectangular Weir**<br>Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60<br>Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64 |

**Primary OutFlow** Max=0.13 cfs @ 16.15 hrs HW=80.65' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.13 cfs of 3.07 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.13 cfs @ 6.03 fps)
  └**3=Sharp-Crested Rectangular Weir** ( Controls 0.00 cfs)

**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=79.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** ( Controls 0.00 cfs)

## Pond POND-2: Wet Basin 2



# *Appendix A*

## *Pre and Post Development Watershed Plans*

WATERSHED AREA PRE 1 9.1 AC.

WATERSHED AREA PRE 2 1.4 AC.

PRE 1

PRE 2

PRE 3

A

B

C

N79°29'04"E 439.18'

S63°24'53"E 602.01'

S10°30'56"E 459.94'

S79°15'55"W 1179.23'

N19°57'52"W 1100.00'

837.44'

781.85'

S31°56'34"W 210.88'

"TIE LINE"

38A (A-TYPE)

260A (B-TYPE)

260A (B-TYPE)

52A (D-TYPE)

25' NO ACTIVITY ZONE

100' WETLAND BUFFER ZONE

N/F PENN CENTRAL CO. CONSOLIDATED RAIL CORP. 133/10

BOULEVARD

SWALE

APPROX. 15" SEWER LOCATION (TO BE CONFIRMED WITH DPI)

TOP OF SLOPE

MON. WELL

2064_SITE-R4


FIELD ENGINEERING CO., INC.
CONSULTING ENGINEERS

11D INDUSTRIAL DRIVE
P.O. BOX 1178
MATTAPOISETT, MA 02739
TEL: (508) 758-2749
FAX: (508) 758-2849

THE CROCKER BUILDING
4 COURT STREET SUITE 104
TAUNTON, MA 02780
TEL: (508) 824-9279
FAX: (508) 824-9276


Revisions

| No. | Description | Date | Appvd. |
|---|---|---|---|
| | | | |

Date: 10/8/15

Scale: 1"=40'

| Drawn By | Designed By | Checked By |
|---|---|---|
| RMS | JCC/RRR | RRR |

Issued For: PERMITTING

PROPOSED SITE DEVELOPMENT
RAW SEAFOODS

SAMUEL BARNET BOULEVARD
NEW BEDFORD, MASSACHUSETTS

Drawing Title: PRE DEVELOPMENT WATERSHED PLAN

| Project No. | Sheet |
|---|---|
| 2064 | 1 OF 1 |

PRE-1

WATERSHED AREA POST 1 4.9 AC.

WATERSHED AREA POST 2 0.9 AC.

WATERSHED AREA POST 3 4.7 AC.

ACCESS DRIVE

PROP. CB6
RIM=83.00
12"INV.(OUT)=79.37

PROP. FE
12"INV.=79.00

RIM=83.30
3-12"INV.(IN)=79.30
12"INV.(OUT)=79.28

24'-12"HDPE
S=0.50%

57'12"HDPE
S=1.00%

55'-12"HDPE
S=0.50%

PROP. CB5
RIM=83.00
12"INV.(OUT)=79.42

PROP. CB7
RIM=84.25
12"INV.(OUT)=79.87

PROP. RETAINING WALL

PROP. WET BASIN
(BASIN #2)

PROP. FLOW CONTROL STRUCTURE

PROP. EDGE DRAIN (SEE DETAIL)

PROP. STORMCEPTOR
WITH DOUBLE GRATE
RIM=81.50
2" INV.(OUT)=78.17

PROP. DMH
RIM=82.0±
2-12" INV.(IN)=77.70
24"INV.(OUT)=77.68

215'-12"HDPE
S=0.61%

7'-12"HDPE
S=1.00%

10'-8" HDPE
S=0.50%

POST 2

POST 3

POST 1

PROP. RDMH
RIM=86.0±
12"INV.=82.01

10'-8" HDPE
S=0.50%

ROOF LEADER (TYP.)

148'-12" HDPE
S=0.50%

10'-8" HDPE
S=0.50%

PROP. RDMH
RIM=85.2±
12"INV.=81.27

RETAINING WALL

RAIL LOADING DOOR
(APPROX. LOCATION)

PROPOSED BUILDING
F.F. ELEV. 87.23

37'-8" D.I.
S=0.20%

PROP. RDMH
RIM=83.0±
12"INV.=80.86

28'-8" D.I.
S=0.50%

PARCEL A
614,297 S.F.
14.10 ACRES

PROPOSED FUTURE
EXPANSION AREA

ROOF LEADER (TYP.)

28'-8" HDPE
S=0.50%

PROP. RDMH
RIM=83.0±
12"INV.=80.52

175'-12"HDPE
S=0.20%

455'-24" HDPE S=0.25%

PROP. DMH
RIM=82.0±
24"INV.=76.2±

75'-24"HDPE
S=0.25%

PROP. DMH
RIM=82.5±
24"INV.=76.54

10'-18" D.I.
S=1.0%

PROP. DMH
RIM=83.0±
12"INV.=80.13

65'-12"HDPE
S=0.20%

PROP. FE
12"INV.=79.45

PROP. FE
18"INV.=79.50

PROP. FE
18"INV.=79.20

PROP. RDMH
RIM=83.6±
12"INV.=80.37

10'-12"HDPE
S=0.50%

PROP. RDMH
RIM=83.0±
12"INV.=80.12

23'-12" HDPE
S=0.50%

PROP. FE
12"INV.=80.00

PROP. DMH1
RIM=83.6±
2-12"INV.(IN)=83.15
12"INV.(OUT)=83.12

PROP. EXTENDED DETENTION/ INFILTRATION BASIN (BASIN #1)

23'-12"HDPE

PROP. FE
12"INV.=80.00

30'-12" HDPE
S=0.50%

10'-12"HDPE
S=0.50%

PROP. FLOW CONTROL STRUCTURE

10' WIDE GRAVEL ACCESS DRIVE

PROP. FE
12"INV.=80.00

PROP. FE
18"INV.=80.00

PROP. CB3
RIM=83.10
12"INV.(OUT)=80.20

PROP. CB4
RIM=83.10
12"INV.(OUT)=80.30

30'-12"HDPE
S=0.50%

PROP. DMH2
RIM=83.5±
2-12"INV.(IN)=80.15
12"INV.(OUT)=80.10

20'-12"HDPE
S=0.50%

PROP. CB2
RIM=83.20
12"INV.(OUT)=80.30

60'-18" D.I.

PROP. FE
18"INV.=80.00

PROP. CB1
RIM=83.20
12"INV.(OUT)=80.22

25' NO ACTIVITY ZONE

50' WETLAND BUFFER ZONE

S79°15'55"W
1179.23'

"TIE LINE"
S51°56'53"W
210.68'

DH IN
CB

APPROX. SEWER LOCATION (TO BE CONFIRMED WITH DPI)

APPROX. 15" SEWER LOCATION (TO BE CONFIRMED WITH DPI)

APPROX. LOCATION 16" WATER MAIN LOCATION (TO BE CONFIRMED WITH DPI)

SAMUEL BARNET BOULEVARD

N/F PENN CENTRAL CO CONSOLIDATED RAIL CORP.
133/10

133/721
N/F

133/1/6

133/1/5

133/1/4

133/1/3

PROP. BRIDGE ABUTMENT

40 0 20 40 80
SCALE: 1 INCH = 40 FEET

2064_SITE-R3


FIELD ENGINEERING CO., INC.
CONSULTING ENGINEERS

11D INDUSTRIAL DRIVE
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THE CROCKER BUILDING
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Revisions

| No. | Description | Date | Appvd. |
|---|---|---|---|

Date: 10/8/2015

Scale: 1"=40'

| Drawn By | Designed By | Checked By |
|---|---|---|
| RMS | JCC/RRR | RMF |

Issued For: PERMITTING

PROPOSED SITE DEVELOPMENT
RAW SEAFOODS

SAMUEL BARNET BOULEVARD
NEW BEDFORD, MASSACHUSETTS

Drawing Title: POST DEVELOPMENT WATERSHED PLAN

| Project No. | Sheet |
|---|---|
| 2064 | 1 OF 1 |

POST-1

# *Section 4*

## *Supplemental Data*


70° 57' 35" W
70° 57' 12" W
41° 43' 21" N
41° 43' 9" N
336990
337040
337090
337140
337190
337240
337290
337340
337390
337440
337490
4620790
4620740
4620690
4620640
4620590
4620540
4620490
52A
1
51A
38A
52A
602
260A
Samuel Barnet Blvd
602
38A
Map Scale: 1:2,470 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 35 70 140 210
Feet
0 100 200 400 600
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

## MAP LEGEND

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

**Soils**
- Soil 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 8, Sep 19, 2014

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** |
| 1 | Water | 0.4 | 2.0% |
| 38A | Pipestone loamy sand, 0 to 3 percent slopes | 5.8 | 26.1% |
| 51A | Swansea muck, 0 to 1 percent slopes | 0.0 | 0.0% |
| 52A | Freetown muck, 0 to 1 percent slopes | 4.4 | 20.0% |
| 260A | Sudbury fine sandy loam, 0 to 3 percent slopes | 10.6 | 48.1% |
| 602 | Urban land | 0.8 | 3.8% |
| **Totals for Area of Interest** | | **22.0** | **100.0%** |

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Phone: (774) 501-2176
Fax: (774) 501-2669

# BORING LOG

BORING NO.: **MW-1**
SHEET 1 OF 1

| | | | |
|---|---|---|---|
| JOB NUMBER: | 131-407 | DRILLING COMPANY: | New England Geotech, Inc. |
| PROJECT NAME: | Greater New Bedford Industrial Foundation | LOCATION: | Jamestown, RI |
| PROJECT ADDRESS: | Lot 11, Samuel Barnet Boulevard, New Bedford | DRILLERS: | Steve |
| CLIENT NAME: | Tom Davis | FIELD TECHNICIAN: | M. Houghton |

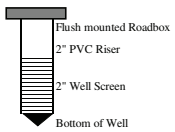
LOCATION: Northernmost location along access road, proximal to utility pole # 1131/5 (see Site Plan)

| GROUNDWATER OBSERVATIONS | | | DRILL INFORMATION | RIG | CASING | CORE BARREL | | |
|---|---|---|---|---|---|---|---|---|
| Date | Depth | Time | TYPE | Geoprobe | | | Casing Elevation (ft.) | |
| 06/17/13 | 4.40 | | INSIDE DIAMETER | 2" Macro Core | | | PVC Elevation (ft.) | |
| | | | HAMMER WEIGHT | | | | Surface Elevation (ft.) | |
| | | | HAMMER FALL | | | | Date Started | 6/11/13 |
| | | | NOTES: | 5' liner (2" diameter) | | | Date Completed | 6/11/13 |

| Depth (feet) | Sample Number | Sample Depths (feet) | Penetration/ Recovery | Blows per 6" penetration | Strata Changes | Soil Descriptions (Burmister System) | Well Construction | PID Readings (ppmv) |
|---|---|---|---|---|---|---|---|---|
| 0' | | 0-3 | 36" | | | Light yellowish brown, gravelly fine-coarse SAND, trace cobbles. Wet. | | 0.0 |
| 5' | | 5-8 | 48" | | | Light grayish brown, gravelly fine to medium SAND, little coarse sand, trace silt. Wet. | | 0.2 |
| | | 8-9 | | | | Red/Brown, gravelly fine to medium SAND, little coarse sand, trace silt. Wet. | | 0.0 |
| 10' | | 10-12 | | | | Unable to collect soil sample for observation due to high water table and potential for cave in of boring. | | |
| | | | | | | End of Boring @ 12' bgs. | | Set Well @ 12' bgs. 10' screen. |
| 15' | | | | | | | | |
| 20' | | | | | | | | |
| 25' | | | | | | | | |
| 30' | | | | | | | | |

COMMENTS:
Did not encounter groundwater; Well not set.

Well Construction




Concrete
Native Soil
Bentonite Seal
Well Sand
0.10" Slotted Well Screen.

Notes:
1.) PID = Photo-Ionization Detector (10.6 eV Lamp)
2.) ppmv = parts per million volumetric
3.) NA = Not available.

▽ Depth to Groundwater

Well No.
**MW-1**

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Phone: (774) 501-2176
Fax: (774) 501-2669

# BORING LOG

BORING NO.: MW-2
SHEET 1 OF 1

| | | | |
|---|---|---|---|
| JOB NUMBER: | 131-407 | DRILLING COMPANY: | New England Geotech, Inc. |
| PROJECT NAME: | Greater New Bedford Industrial Foundation | LOCATION: | Jamestown, RI |
| PROJECT ADDRESS: | Lot 11, Samuel Barnet Boulevard, New Bedford | DRILLERS: | Steve |
| CLIENT NAME: | Tom Davis | FIELD TECHNICIAN: | M. Houghton |

LOCATION: South of MW-1 along access road, proximal to utility pole # 1131/4 (see Site Plan)

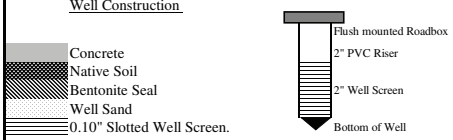
| GROUNDWATER OBSERVATIONS | | | DRILL INFORMATION | RIG | CASING | CORE BARREL |
|---|---|---|---|---|---|---|
| Date | Depth | Time | TYPE | Geoprobe | | |
| 06/17/13 | 6.77 | | INSIDE DIAMETER | 2" Macro Core | | |
| | | | HAMMER WEIGHT | | | |
| | | | HAMMER FALL | | | |
| | | | NOTES: | 5' liner (2" diameter) | | |

| | |
|---|---|
| Casing Elevation (ft.) | |
| PVC Elevation (ft.) | |
| Surface Elevation (ft.) | |
| Date Started | 6/11/13 |
| Date Completed | 6/11/13 |

| Depth (feet) | Sample Number | Sample Depths (feet) | Penetration/ Recovery | Blows per 6" penetration | Strata Changes | Soil Descriptions (Burmister System) | Well Construction | PID Readings (ppmv) |
|---|---|---|---|---|---|---|---|---|
| 0' | | 0-0.5 | 24" | | | Orange-brown, silty fine to medium SAND, trace coarse gravel. Damp. | | 0.0 |
| | | 0.5-2 | | | | Light brown, gravelly fine to coarse SAND, little coarse gravel. Damp. | | |
| 5' | | 5-8.5 | 48" | | ▽ | Gray-brown, gravelly fine to coarse SAND, little coarse gravel. Wet. | | 0.0 |
| | | 8.5-9 | | | | Brown, fine to medium SAND, little silt. Wet. | | |
| 10' | | 10-12 | | | | Unable to collect soil sample for observation due to high water table and potential for cave in of boring. | | |
| | | | | | | End of Boring @ 12' bgs. | | Set Well @ 12' bgs. |
| | | | | | | | | 10' screen. |
| 15' | | | | | | | | |
| 20' | | | | | | | | |
| 25' | | | | | | | | |
| 30' | | | | | | | | |

COMMENTS:
Did not encounter groundwater; Well not set.

Well Construction




Notes:
1.) PID = Photo-Ionization Detector (10.6 eV Lamp)
2.) ppmv = parts per million volumetric
3.) NA = Not available.

▽ Depth to Groundwater

Well No.
MW-2

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Phone: (774) 501-2176
Fax: (774) 501-2669

# BORING LOG

BORING NO.: **MW-3**
SHEET 1 OF 1

| | | | |
|---|---|---|---|
| JOB NUMBER: | 131-407 | DRILLING COMPANY: | New England Geotech, Inc. |
| PROJECT NAME: | Greater New Bedford Industrial Foundation | LOCATION: | Jamestown, RI |
| PROJECT ADDRESS: | Lot 11, Samuel Barnet Boulevard, New Bedford | DRILLERS: | Steve |
| CLIENT NAME: | Tom Davis | FIELD TECHNICIAN: | M. Houghton |

LOCATION: Immediately north of Samuel Barnet Boulevard (see Site Plan)

| GROUNDWATER OBSERVATIONS | | | DRILL INFORMATION | RIG | CASING | CORE BARREL |
|---|---|---|---|---|---|---|
| Date | Depth | Time | TYPE | Geoprobe | | |
| 06/17/13 | 6.05 | | INSIDE DIAMETER | 2" Macro Core | | |
| | | | HAMMER WEIGHT | | | |
| | | | HAMMER FALL | | | |
| | | | NOTES: | 5' liner (2" diameter) | | |

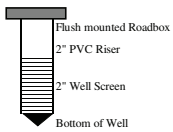
| | |
|---|---|
| Casing Elevation (ft.) | |
| PVC Elevation (ft.) | |
| Surface Elevation (ft.) | |
| Date Started | 6/11/13 |
| Date Completed | 6/11/13 |

| Depth (feet) | Sample Number | Sample Depths (feet) | Penetration/ Recovery | Blows per 6" penetration | Strata Changes | Soil Descriptions (Burmister System) | Well Construction | PID Readings (ppmv) |
|---|---|---|---|---|---|---|---|---|
| 0' | | 0-0.5 | 30" | | | Red/Brown, fine to medium SAND, little silt. Damp. | | 0.0 |
| | | 0.5-2.5 | | | | Light brown, gravelly fine to coarse SAND, little coarse gravel. Damp. | | |
| 5' | | 5-6.5 | 48" | | ▽ | Brown, fine to medium SAND, little silt, trace coarse gravel. Wet. | | 0.0 |
| | | 6.5-8.7 | | | | Light brown, gravelly fine to coarse SAND, trace coarse gravel. Wet. | | 0.0 |
| | | 8.7-9 | | | | Dark brown, gravelly fine to coarse SAND, trace coarse gravel. Wet. | | |
| 10' | | 10-12 | | | | Unable to collect soil sample for observation due to high water table and potential for cave in of boring. | | |
| | | | | | | End of Boring @ 12' bgs. | | Set Well @ 12' bgs. |
| | | | | | | | | 10' screen. |
| 15' | | | | | | | | |
| 20' | | | | | | | | |
| 25' | | | | | | | | |
| 30' | | | | | | | | |

COMMENTS:
Did not encounter groundwater; Well not set.

Well Construction

- Concrete
- Native Soil
- Bentonite Seal
- Well Sand
- 0.10" Slotted Well Screen.




Notes:
1.) PID = Photo-Ionization Detector (10.6 eV Lamp)
2.) ppmv = parts per million volumetric
3.) NA = Not available.

▽ Depth to Groundwater

Well No.
**MW-3**

FIELD ENGINEERING, INC. MATTAPOISETT, MA

# WATER QUALITY VOLUME CALCULATIONS

| | | | |
|---|---|---|---|
| Client: | RAW SEAFOODS | Job No. | 2064 |
| Project: | PROPOSED COLD STORAGE FACILITY | Date: | 10/8/2015 |
| Location: | SAMUEL BARNET BOULEVARD | Design by: | R. RICCIO |

## REQUIRED WATER QUALITY VOLUME-POST-1

| | |
|---|---|
| UNIT VOLUME (in.) = | 0.50 |
| IMPERVIOUS AREA (s.f.) = | 160,690 |
| WATER QUALITY VOLUME (cu.ft.) = | 6,695 |

## AVAILABLE VOLUME CALCULATION (POND-1)

| ELEV (ft.) | AREA (s.f.) | VOL (cu.ft.) | CUM. VOL (cu.ft.) | CUM. VOL (ac.ft.) |
|---|---|---|---|---|
| ** | ** | | | |
| 80.0 | 26,586.0 | 0.0 | 0.0 | 0.000 |
| 81.5 | 30,067.0 | 42,489.8 | 42,489.8 | 0.975 |

| | | | |
|---|---|---|---|
| WATER QUALITY VOLUME PROVIDED = | 42,489.8 | 0.975 | |
| WATER QUALITY VOLUME REQUIRED = | 6,695.4 | 0.154 | OK |

FIELD ENGINEERING, INC. MATTAPOISETT, MA

# WATER QUALITY VOLUME CALCULATIONS

| | | | |
|---|---|---|---|
| Client: | RAW SEAFOODS | Job No. | 2064 |
| Project: | PROPOSED COLD STORAGE FACILITY | Date: | 10/8/2015 |
| Location: | SAMUEL BARNET BOULEVARD | Design by: | R. RICCIO |

## REQUIRED WATER QUALITY VOLUME-POST-2

| | |
|---|---|
| UNIT VOLUME (in.) = | 0.50 |
| IMPERVIOUS AREA (s.f.) = | 17,968 |
| WATER QUALITY VOLUME (cu.ft.) = | 749 |

## AVAILABLE VOLUME CALCULATION (POND-2)

| ELEV (ft.) | AREA (s.f.) | VOL (cu.ft.) | CUM. VOL (cu.ft.) | CUM. VOL (ac.ft.) |
|---|---|---|---|---|
| ** | ** | | | |
| 79.0 | 3,428.0 | 0.0 | 0.0 | 0.000 |
| 82.0 | 6,058.0 | 14,229.0 | 14,229.0 | 0.327 |

| | | | |
|---|---|---|---|
| WATER QUALITY VOLUME PROVIDED = | 14,229.0 | 0.327 | |
| WATER QUALITY VOLUME REQUIRED = | 748.7 | 0.017 | OK |

FIELD ENGINEERING, INC. MATTAPOISETT, MA

RECHARGE VOLUME CALCULATIONS

| | | | |
|---|---|---|---|
| Client: | RAW SEAFOODS | Job No. | 2064 |
| Project: | PROPOSED COLD STORAGE FACILITY | Date: | 10/8/2015 |
| Location: | SAMUEL BARNET BOULEVARD | Design by: | R. RICCIO |

RECHARGE VOLUME CALCULATIONS

| | |
|---|---|
| HYDROLOGIC SOIL GROUP | A |
| UNIT VOLUME (in.) = | 0.60 |
| IMPERVIOUS AREA (s.f.) = | 41,201 |
| RECHARGE VOLUME (cu.ft.) = | 2,060 |

| | |
|---|---|
| HYDROLOGIC SOIL GROUP | B |
| UNIT VOLUME (in.) = | 0.35 |
| IMPERVIOUS AREA (s.f.) = | 149,855 |
| RECHARGE VOLUME (cu.ft.) = | 4,371 |

AVAILABLE VOLUME CALCULATION (POND-1)

| ELEV (ft.) | AREA (s.f.) | VOL (cu.ft.) | CUM. VOL (cu.ft.) | CUM. VOL (ac.ft.) |
|---|---|---|---|---|
| ** | ** | | | |
| 80.0 | 26,586.0 | 0.0 | 0.0 | 0.000 |
| 80.8 | 28,312.0 | 20,586.8 | 20,586.8 | 0.473 |

| | | | |
|---|---|---|---|
| RECHARGE VOLUME PROVIDED | 20,586.8 | 0.473 | |
| RECHARGE VOLUME REQUIRED | 6,430.8 | 0.148 | |
| ADJUSTED RECHARGE VOLUME REQUIRED* | 7,646.0 | 0.176 | OK |

ADJUSTED RECHARGE VOLUME REQUIRED CALCULATED BASED ON RATIO OF TOTAL IMPERVIOUS AREA TO IMPERVIOUS AREA DRAINING TO RECHARGE FACILITY (BASIN 1) PER VOL 3, CH 1 OF MA STORMWATER HANDBOOK

DRAWDOWN TIME CALCULATION

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

| | | |
|---|---|---|
| RECHARGE VOLUME PROVIDED (CF)= | 20,586.8 | |
| DESIGN INFILTRATION RATE (IN/HR)= | 1.0 | |
| BOTTOM AREA(SF)= | 26,586.0 | |
| DRAWDOWN TIME (HRS)= | 9.3 | OK |

FIELD ENGINEERING, INC. TAUNTON, MA

# SEDIMENT FOREBAY SIZING CALCULATION

| | | | |
|---|---|---|---|
| Client: | RAW SEAFOODS | Job No. | 2064 |
| Project: | PROPOSED COLD STORAGE FACILITY | Date: | 10/8/2015 |
| Location: | SAMUEL BARNET BOULEVARD | Design by: | R. RICCIO |

## REQUIRED SEDIMENT FOREBAY SIZING-DETENTION BASIN 1

| | |
|---|---|
| TOTAL CONTRIBUTING AREA (acre) = | 4.94 |
| MINIMUM FOREBAY SIZE (in. per acre) = | 0.10 |
| FOREBAY REQUIRED CAPACITY (cu. ft.) = | 1,793 |

## AVAILABLE VOLUME CALCULATION- FOREBAY 1

| ELEV (ft.) | AREA (s.f.) | VOL (cu.ft.) | CUM. VOL (cu.ft.) | CUM. VOL (ac.ft.) |
|---|---|---|---|---|
| ** | ** | | | |
| 80.0 | 661.0 | 0.0 | 0.0 | 0.000 |
| 82.0 | 1,265.0 | 1,926.0 | 1,926.0 | 0.044 |

## AVAILABLE VOLUME CALCULATION-FOREBAY 2

| ELEV (ft.) | AREA (s.f.) | VOL (cu.ft.) | CUM. VOL (cu.ft.) | CUM. VOL (ac.ft.) |
|---|---|---|---|---|
| ** | ** | | | |
| 80.0 | 439.0 | 0.0 | 0.0 | 0.000 |
| 82.0 | 937.0 | 1,376.0 | 1,376.0 | 0.032 |

| | | | |
|---|---|---|---|
| FOREBAY VOLUME PROVIDED | 3,302.0 | 0.076 | |
| FOREBAY VOLUME REQUIRED | 1,793.2 | 0.041 | OK |

FIELD ENGINEERING, INC. TAUNTON, MA

# SEDIMENT FOREBAY SIZING CALCULATION

| | | | |
|---|---|---|---|
| Client: | RAW SEAFOODS | Job No. | 2064 |
| Project: | PROPOSED COLD STORAGE FACILITY | Date: | 10/8/2015 |
| Location: | SAMUEL BARNET BOULEVARD | Design by: | R. RICCIO |

## REQUIRED SEDIMENT FOREBAY SIZING-DETENTION BASIN 2

| | |
|---|---|
| TOTAL CONTRIBUTING AREA (acre) = | 0.9 |
| MINIMUM FOREBAY SIZE (in. per acre) = | 0.10 |
| FOREBAY REQUIRED CAPACITY (cu. ft.) = | 327 |

## AVAILABLE VOLUME CALCULATION- FOREBAY 1

| ELEV (ft.) | AREA (s.f.) | VOL (cu.ft.) | CUM. VOL (cu.ft.) | CUM. VOL (ac.ft.) |
|---|---|---|---|---|
| ** | ** | | | |
| 79.0 | 269.0 | 0.0 | 0.0 | 0.000 |
| 81.0 | 695.0 | 964.0 | 964.0 | 0.022 |

| | | | |
|---|---|---|---|
| FOREBAY VOLUME PROVIDED | 964.0 | 0.022 | |
| FOREBAY VOLUME REQUIRED | 326.7 | 0.008 | OK |

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

*Version 1, Automated: Mar. 4, 2008*

Location: Samuel Barnet Boulevard-POST 2

## TSS Removal Calculation Worksheet

| B<br>BMP[1] | C<br>TSS Removal Rate[1] | D<br>Starting TSS Load* | E<br>Amount Removed (C*D) | F<br>Remaining Load (D-E) |
|---|---|---|---|---|
| **Deep Sump and Hooded Catch Basin** | **0.25** | **1.00** | **0.25** | **0.75** |
| **Sediment Forebay** | **0.25** | **0.75** | **0.19** | **0.56** |
| **Constructed Stormwater Wetland** | **0.80** | **0.56** | **0.45** | **0.11** |
| | **0.00** | **0.11** | **0.00** | **0.11** |
| | **0.00** | **0.11** | **0.00** | **0.11** |

**Total TSS Removal =** **89%**

**Separate Form Needs to be Completed for Each Outlet or BMP Train**

Project: RAW SEAFOODS
Prepared By: RRR
Date: 10/8/2015

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

INSTRUCTIONS:
1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

*Version 1, Automated: Mar. 4, 2008*

Location: Samuel Barnet Boulevard-POST 1

## TSS Removal Calculation Worksheet

| B<br>BMP[1] | C<br>TSS Removal Rate[1] | D<br>Starting TSS Load* | E<br>Amount Removed (C*D) | F<br>Remaining Load (D-E) |
|---|---|---|---|---|
| **Deep Sump and Hooded Catch Basin** | **0.25** | **1.00** | **0.25** | **0.75** |
| **Sediment Forebay** | **0.25** | **0.75** | **0.19** | **0.56** |
| **Infiltration Basin** | **0.80** | **0.56** | **0.45** | **0.11** |
| | **0.00** | **0.11** | **0.00** | **0.11** |
| | **0.00** | **0.11** | **0.00** | **0.11** |

**Total TSS Removal =** **89%**

**Separate Form Needs to be Completed for Each Outlet or BMP Train**

Project: RAW SEAFOODS
Prepared By: RRR
Date: 10/8/2015

*Equals remaining load from previous BMP (E) which enters the BMP

Non-automated TSS Calculation Sheet must be used if Proprietary BMP Proposed
1. From MassDEP Stormwater Handbook Vol. 1

# Stormceptor Design Summary

**PCSWMM for Stormceptor**

## Project Information

| | |
|---|---|
| Date | 10/8/2015 |
| Project Name | Raw Seafoods |
| Project Number | 2064 |
| Location | Samuel Barnet Blvd |

## Designer Information

| | |
|---|---|
| Company | Field Engineering |
| Contact | N/A |

## Notes

Loading Area Stormceptor

## Drainage Area

| | |
|---|---|
| Total Area (ac) | 0.65 |
| Imperviousness (%) | 90 |

The Stormceptor System model STC 450i achieves the water quality objective removing 82% TSS for a Fine (organics, silts and sand) particle size distribution.

## Rainfall

| | |
|---|---|
| Name | BOSTON WSFO AP |
| State | MA |
| ID | 770 |
| Years of Records | 1948 to 2005 |
| Latitude | 42°21'38"N |
| Longitude | 71°0'38"W |

## Water Quality Objective

| | |
|---|---|
| TSS Removal (%) | 80 |

## Upstream Storage

| Storage (ac-ft) | Discharge (cfs) |
|---|---|
| 0 | 0 |

## Stormceptor Sizing Summary

| Stormceptor Model | TSS Removal % |
|---|---|
| **STC 450i** | **82** |
| STC 900 | 89 |
| STC 1200 | 89 |
| STC 1800 | 89 |
| STC 2400 | 92 |
| STC 3600 | 92 |
| STC 4800 | 94 |
| STC 6000 | 94 |
| STC 7200 | 95 |
| STC 11000 | 97 |
| STC 13000 | 97 |
| STC 16000 | 97 |

## Particle Size Distribution

Removing silt particles from runoff ensures that the majority of the pollutants, such as hydrocarbons and heavy metals that adhere to fine particles, are not discharged into our natural water courses. The table below lists the particle size distribution used to define the annual TSS removal.

Fine (organics, silts and sand)

| Particle Size µm | Distribution % | Specific Gravity | Settling Velocity ft/s | | Particle Size µm | Distribution % | Specific Gravity | Settling Velocity ft/s |
|---|---|---|---|---|---|---|---|---|
| 20 | 20 | 1.3 | 0.0013 | | | | | |
| 60 | 20 | 1.8 | 0.0051 | | | | | |
| 150 | 20 | 2.2 | 0.0354 | | | | | |
| 400 | 20 | 2.65 | 0.2123 | | | | | |
| 2000 | 20 | 2.65 | 0.9417 | | | | | |

## Stormceptor Design Notes

- Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor.
- Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal.
- Only the STC 450i is adaptable to function with a catch basin inlet and/or inline pipes.
- Only the Stormceptor models STC 450i to STC 7200 may accommodate multiple inlet pipes.
- Inlet and outlet invert elevation differences are as follows:

**Inlet and Outlet Pipe Invert Elevations Differences**

| Inlet Pipe Configuration | STC 450i | STC 900 to STC 7200 | STC 11000 to STC 16000 |
|---|---|---|---|
| Single inlet pipe | 3 in. | 1 in. | 3 in. |
| Multiple inlet pipes | 3 in. | 3 in. | Only one inlet pipe. |

- Design estimates are based on stable site conditions only, after construction is completed.
- Design estimates assume that the storm drain is not submerged during zero flows. For submerged applications, please contact your local Stormceptor representative.
- Design estimates may be modified for specific spills controls. Please contact your local Stormceptor representative for further assistance.
- For pricing inquiries or assistance, please contact Rinker Materials 1 (800) 909-7763 www.rinkerstormceptor.com

FIELD ENGINEERING CO. INC. MATTAPOISETT, MA

## RUN-OFF COEFFICIENT CALCULATIONS

| | | | |
|---|---|---|---|
| Client: | RAW SEAFOODS | Job No. | 2064 |
| Project: | PROP COLD STORAGE FACILITY | Date | 10/8/2014 |
| Location: | SAMUEL BARNET BOULEVARD | Design by: | RRR |

Runoff coefficient (C) factor:

| | |
|---|---|
| Impervious areas (Roofs and paved areas) | 0.90 |
| Pervious areas (landscaped;lawn areas) | 0.40 |
| Pervious areas (undisturbed;wooded) | 0.30 |

| AREA NO. | LAWN AREA (ac.) | WOODED AREA (ac.) | IMPERV. AREA (ac.) | TOTAL AREA (ac.) | COMPOSITE FACTOR "C" |
|---|---|---|---|---|---|
| CB1 | 0.005 | 0.00 | 0.035 | 0.04 | 0.84 |
| CB2 | 0.005 | 0.00 | 0.035 | 0.04 | 0.84 |
| CB3 | 0.067 | 0.00 | 0.140 | 0.21 | 0.74 |
| CB4 | 0.019 | 0.00 | 0.142 | 0.16 | 0.84 |
| CB5 | 0.186 | 0.00 | 0.123 | 0.31 | 0.60 |
| CB6 | 0.101 | 0.00 | 0.123 | 0.22 | 0.67 |
| CB7 | 0.026 | 0.00 | 0.212 | 0.24 | 0.85 |
| DCB8 | 0.310 | 0.00 | 0.572 | 0.88 | 0.72 |

FIELD ENGINEERING CO., INC. MATTAPOISETT, MA

STORM DRAINAGE DESIGN DATA
Rational Method Q=CIA
Design Storm 25YEAR

Client: Raw Seafoods Job No: 2064
Project: Proposed Site Development Date: 10/9/2015
Location: Samuel Barnet Boulevard Cal By: R. Riccio

NOTE: Data entry columns headed by double asterisk. **

| From MH | Inv. Elev. | To MH | Inv. Elev. | Length (ft) | Slope (%) | Area Inc. (ac.) | Area Total (ac.) | Runoff Inc. "C" | Coef. Ave. "C" | Int. (in/hr) "I" | Inlet Time (min) | Pipe Time (min) | Total Time (min) | Flow Inc. (cfs) | Flow Total (cfs) | Pipe Dia. (in) | "n" | Slope (ft/ft) | Flow Full (cfs) | Vel. Full (ft/s) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-1 | 80.22 | DMH-1 | 80.15 | 10 | 0.70% | 0.04 | 0.04 | 0.84 | 0.84 | 5.6 | 10.00 | 0.04 | 10.00 | 0.19 | 0.19 | 12 | 0.013 | 0.0070 | 2.96 | 3.77 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-2 | 80.30 | DMH-1 | 80.15 | 30 | 0.50% | 0.04 | 0.04 | 0.84 | 0.84 | 5.6 | 10.00 | 0.16 | 10.00 | 0.19 | 0.19 | 12 | 0.013 | 0.0050 | 2.50 | 3.19 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| DMH-1 | 80.12 | FE | 80.00 | 23 | 0.52% | 0.00 | 0.08 | 0.00 | 0.84 | 5.6 | 0.00 | 0.12 | 10.04 | 0.00 | 0.38 | 12 | 0.013 | 0.0052 | 2.56 | 3.26 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-3 | 80.20 | DMH-2 | 80.15 | 10 | 0.50% | 0.21 | 0.21 | 0.74 | 0.74 | 5.6 | 5.00 | 0.05 | 5.00 | 0.87 | 0.87 | 12 | 0.013 | 0.0050 | 2.50 | 3.19 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-4 | 80.30 | DMH-2 | 80.15 | 30 | 0.50% | 0.16 | 0.16 | 0.84 | 0.84 | 5.6 | 5.00 | 0.16 | 10.16 | 0.75 | 0.75 | 12 | 0.013 | 0.0050 | 2.50 | 3.19 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| DMH-2 | 80.10 | FE | 80.00 | 20 | 0.50% | 0.00 | 0.37 | 0.88 | 0.78 | 5.6 | 5.00 | 0.10 | 5.00 | 0.00 | 1.62 | 12 | 0.013 | 0.0050 | 2.50 | 3.19 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-5 | 79.42 | DMH-3 | 79.30 | 24 | 0.50% | 0.31 | 0.31 | 0.60 | 0.60 | 5.6 | 0.00 | 0.13 | 10.32 | 1.04 | 1.04 | 12 | 0.013 | 0.0050 | 2.50 | 3.19 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-6 | 79.37 | DMH-3 | 79.30 | 7 | 1.00% | 0.22 | 0.22 | 0.67 | 0.67 | 5.6 | 0.00 | 0.03 | 10.34 | 0.83 | 0.83 | 12 | 0.013 | 0.0100 | 3.54 | 4.51 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| CB-7 | 79.87 | DMH-3 | 79.30 | 57 | 1.00% | 0.24 | 0.24 | 0.85 | 0.85 | 5.6 | 5.00 | 0.21 | 5.00 | 1.14 | 1.14 | 12 | 0.013 | 0.0100 | 3.54 | 4.51 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| DMH-3 | 79.28 | FE | 79.00 | 55 | 0.51% | 0.00 | 0.77 | 0.00 | 0.70 | 5.6 | 0.00 | 0.25 | 10.37 | 0.00 | 3.01 | 15 | 0.013 | 0.0051 | 4.58 | 3.73 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |
| DCB-8 | 78.17 | DMH | 77.70 | 95 | 0.49% | 0.88 | 0.88 | 0.72 | 0.72 | 5.6 | 10.00 | 0.43 | 10.00 | 3.55 | 3.55 | 15 | 0.013 | 0.0049 | 4.52 | 3.68 |
| ** | ** | ** | ** | ** | | ** | | ** | | ** | ** | | | | | ** | ** | | | |

# *Appendix B*

## *Long Term Pollution Prevention Plan*

Long Term Pollution Prevention Plan
Proposed Cold Storage Facility
Raw Seafoods Inc.
New Bedford, MA

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 to the wetland systems. It would be anticipated that a property manager would be on-site and trained in the proper storage of materials and waste products on site.

3.0 Routine Maintenance of Stormwater BMP's

The Stormwater BMP's including the extended detention basin, wet basin, sediment forebays, catch basins 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.

4.0 Spill Prevention and Response Plans

It is anticipated that a property manager would be under contract and on site on a regular basis trained in spill prevention and response. MSDS sheets are required to be on site for the handling of any chemicals or compounds that may be associated with any of the approved uses at the site. Emergency contact numbers will be posted and provided to the various tenants that may occupy the building with a 24-hour contact number in the event of any spills on-site.

5.0 Landscaping Provisions

The landscaping on site will be maintained with generally accepted industry practices. Landscaping companies servicing the facility will be notified of the sensitivity of the wetland resource areas and stormwater management systems on site. 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.

6.0 Pet Waste Management Provisions

It is not anticipated that there would be any pets on site at this commercial facility.

7.0 Provisions for Solid Waste Management

Dumpsters will be provided on-site for the disposal of solid waste. These dumpsters will be enclosed in fencing and emptied on a regular basis in accordance with Board of Health regulations and the Conditions of Site Plan Review approval.

8.0 Snow Disposal Guidelines

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

9.0 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.

## 10.0 Street Sweeping Schedule

Sweeping of the parking lots will be performed twice annually. Sweeping shall occur in the spring following the winter season and again in the fall.

## 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

It is expected that a Property Management Company would be contracted to manage the site property as a whole. Included in this contract would be the operation and maintenance of 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 of the project, Raw Seafoods, Inc. would be the emergency contacts for any implementation measures that may be required on this Long-Term Pollution Prevention Plan. It would be anticipated that emergency contact numbers would be posted throughout the site building and facilities should any situations arise.

# *Appendix C*

## *Illicit Discharge Compliance Statement*

Illicit Discharge Compliance Statement
Proposed Cold Storage Facility
Raw Seafoods Inc.
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 Raw Seafoods 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.