Storm Water Management Report

366 Hathaway Road
New Bedford, Massachusetts

Prepared for:

Beacon Compassion
12 Post Office Square
6th Floor
Boston, Massachusetts 02109

August 2, 2021

Prepared by:

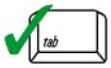
Hayes Engineering, Inc.
603 Salem Street
Wakefield, MA 01880

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

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

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

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

Checklist for Stormwater Report

Checklist (continued)

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

☒ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☐ Reduced Impervious Area (Redevelopment Only)

☐ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☐ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

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

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.

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

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.

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

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

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.

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

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.

Stormwater Management Report

- Introduction & Background
- Compliance with Massachusetts Stormwater Standards
  - → Standard 1: No New Untreated Discharges
  - → Standard 2: Peak Rate Attenuation
  - → Standard 3: Recharge
  - → Standard 4: Water Quality
  - → Standard 5: LUHPPLs
  - → Standard 6: Critical Areas
  - → Standard 7: Redevelopment Projects
  - → Standard 8: Construction Period Pollution Plan
  - → Standard 9: Operation and Maintenance Plan
  - → Standard 10: Prohibition of Illicit Discharges
- Construction Pollution Prevention Plan
- Long-term Pollution Prevention Plan
- Appendix A: NRCS Soil Mapping and Data
- Appendix B: Drainage Calculations
- Sheet WS1: Existing Conditions Watershed Map
- Sheet WS2: Proposed Conditions Watershed Map

Introduction and Background

The Project Site (the "Site") is located at 366 Hathaway Road in New Bedford, MA. The site in its existing condition is covered in asphalt and/or gravel with limited vegetation and is occupied by a structure, awning, and associated parking areas. The Applicant is proposing to demolish the existing structure and construct a 4,300± square foot (sf.) retail marijuana establishment, associated parking, and landscaping. The project is a partial redevelopment project and will treat runoff from newly created impervious surfaces via deep sump catch basins and a proposed Stormtech SC-310 subsurface infiltration system with isolator row.

Soils within the limit of work are classified as Urban land complex and does not have a hydrologic soil group classification. Soils are assumed to be representative of hydrologic soil group C based on the varying adjacent soil groups as identified by the USDA Natural Resource Conservation Service mapping (refer to Appendix A – NRCS Soil Map).

This report evaluates compliance with the Massachusetts Department of Environmental Protection's (MassDEP's) Storm Water Management Standards.

Methodology

This study evaluates the Site hydrology in accordance with the National Resource Conservation Service (NRCS), formerly the Soil Conservation Service (SCS), methodology outlined in Technical Release 55 and Technical Release 20. Modelling was performed using HydroCAD™ software and model parameters based on pre- and post-development hydrologic soil group, land cover conditions, and topography. The 24-hour rainfall amounts for the 2, 10, 25, and 100-year storms are to be based on the totals identified in Technical Paper 40 (TP-40) – Rainfall Frequency Atlas of the United States, the storm volumes for New Bedford, MA are as follows:

- 2 yr. - 24 hr. storm = 3.1 inches
- 10 yr. - 24 hr. storm = 4.6 inches
- 25 yr. - 24 hr. storm = 5.4 inches
- 100 yr.- 24 hr. storm = 6.5 inches

Analysis:

The southerly gutterline of Hathaway Road at the westerly access drive was selected as the point of analysis (the "Design Point") for this analysis. All areas within the limit of work, are tributary to this point. By mitigating peak rates of runoff to this design point there will be no increase in rate of stormwater runoff to the drainage system within Hathaway Road.

Peak rate of runoff was evaluated at the Design Point in both the existing and proposed conditions using the cumulative rainfall depths for the 2, 10, 25 and 100-year, Type III, 24-hour storm events having rainfall totals as identified above. Peak flow attenuation in the proposed condition is provided by the proposed subsurface infiltration system (PSIS1). Outflows from the proposed PSIS are infiltrated into the on-site soils. Surface runoff not captured and conveyed to the subsurface infiltration area are allowed to run overland to the Design Point.

The following tables summarize the calculated peak rate of runoff to the Design Point for the project:

Table 1, Peak Flow Rate (cfs)

	2-Year Storm Event (3.2"/24-hr.)		10-Year Storm Event (4.7"/24-hr.)		25-Year Storm Event (6.0"/24-hr.)		100-Year Storm Event (8.5"/24-hr.)	
Design Point	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)	Existing (cfs)	Proposed (cfs)
Gutterline Hathaway Road	2.2	*2.2*	3.4	*3.4*	4.0	*4.0*	4.9	*4.7*

Compliance with Stormwater Management Standards

Standard 1: No New Untreated Discharges

The Project, as proposed, does will not create new untreated discharges of stormwater runoff.

Standard 2: Peak Rate Attenuation

The Project, as proposed, does not increase peak rate of runoff in 2, 10, 25 and 100-year, Type III, 24-hour storm events (see Table 1).

Standard 3: Recharge

The soils on the Project site are representative of Hydrologic Soil Group C. Newly created impervious surfaces are directed to subsurface infiltration area sized to infiltrate the recharge volume.

The project results in an increase of 1,250 sf. of impervious surface from the exiting condition. The recharge depth for hydrologic soil group C is 0.25-inches, resulting in a Recharge Volume of 26 cubic feet (cf.). The proposed subsurface infiltration system provides a storage volume of 858 cf.

Standard 4: Water Quality

The project as proposed will capture runoff from new impervious surfaces with deep sump and hooded catch basins directed to a subsurface infiltration system consisting of (24) Stormtech SC-310 chambers with an isolator row. This treatment train provides a presumptive TSS removal rate of 85%.

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

There are no Land Uses with Higher Potential Pollutant Loads (LUHPPLs) associated with the Project.

Standard 6: Critical Areas

There are no Critical Areas associated with the Project.

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

The project represents a partial redevelopment project and portions of the property are subject to the Standards only to the maximum extent practicable. Runoff from newly created impervious is subject to the Standards.

Standard 8: Construction Period Pollution Prevention & Sedimentation Control

A construction period pollution prevention plan accompanies this report. The Project is not subject to a NPDES Construction General Permit as the work will not result in total land disturbance greater than 1-acre.

Standard 9: Operations and Maintenance Plan

A post-construction Operation and Maintenance Plan (Long-Term Pollution Prevention Plan) accompanies this report.

Standard 10: Prohibition of Illicit Discharges

The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges. An illicit discharge statement is also included in the plan.

Construction Period Pollution Prevention Plan

Project Name: Beacon Compassion

Owner's Name: Beacon Compassion

Applicant's Name: Beacon Compassion

Party Responsible for Maintenance: To be determined

Project Description:

The construction of a 4,300± sf. retail marijuana establishment, associated parking, driveways and landscaping at 366 Hathaway Road in New Bedford, MA.

Erosion and Sedimentation Control Measures During Construction Activities:

Storm Drain Inlet Protection

A temporary storm inlet protection filter will be placed in all catch basin units. The purpose of the filter is to prevent the inflow of sediment into the closed drainage system(s). The filters shall remain in place until a permanent vegetative cover is established and the transport of sediment is no longer visibly apparent. The filter shall be inspected and maintained on a weekly basis and after significant storm events. Significant storm events are those having greater than one-quarter (1/4) inch of precipitation in a 24-hour period.

Surface Stabilization

The surface of all disturbed areas shall be stabilized during and after construction. Temporary measures shall be taken during construction to prevent erosion and sedimentation. No construction sediment shall be allowed to enter infiltration areas. All disturbed slopes shall be stabilized with a permanent vegetative cover. Some or all of the following measures can be used on the Project as conditions may warrant:

- Temporary Seeding
- Temporary Mulching
- Placement of Hay
- Placement of Geo-Synthetic Fabrics
- Hydroseeding
- Permanent Seeding
- Placement of Sod

Surface and Subsurface Infiltration Facilities

No construction period runoff should be directed toward infiltration facilities. The performance of these facilities shall be checked weekly and after significant storm events throughout construction.

INSPECTION SCHEDULE and EVALUATION CHECKLIST

To be completed weekly and within 24-hours of significant rainfall events (greater than 1/4-inches in a 24-hour period).

Inspector's Name: _____ Date: _____

Qualifications: _____

_____

Days since last rainfall: _____ days Amount of last rainfall: _____inches

Stabilization Measures

Sub-Catchment	Date of Last Disturbance	Date of Next Disturbance	Stabilized (Yes or No)	Stabilized With:	Condition

Stabilization required: _____

_____

_____

_____

_____

_____

_____

To be performed by: _____ on or before: _____

PERIMETER CONTROLS

Date of Inspection: _____

Silt Fence and Hay Bales:

To Study Area:	Has sediment reached 1/3 height of silt fence? (Yes or No)	Depth of Silt (inches)	Is fence secure? (Yes or No)	Is there evidence of bypass or overtopping? (Yes or No)	Describe location of Problem(s), if any.

Maintenance required for silt fence and hay bales: _____

_____

_____

To be performed by: _____ on or before: _____

Stabilized Construction Entrance:

Location	Does much sediment get tracked onto roadway? (Yes or No)	Is gravel clean or full of sediment?	Is all traffic using the entrance to access/exit the site? (Yes or No)	Is the culvert beneath the entrance working? (Yes or No)

Maintenance required for stabilized construction entrance: _____

_____

_____

To be performed by: _____ on or before: _____

Other Best Management Practices:

BMP	In use? (Yes or No)	Maintenance Required? (Yes or No)	Describe location of Problem(s), if any.

Maintenance required: _____

_____

_____

To be performed by: _____ on or before: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Signature: _____ Date: _____

Long-Term Pollution Prevention Plan

Project Name: Beacon Compassion

Owner's Name: Beacon Compassion

Applicant's Name: Beacon Compassion

Party Responsible for Maintenance: To be determined

Project Description:

The construction of a 4,300± sf. retail marijuana establishment, associated parking, driveways and landscaping at 366 Hathaway Road in New Bedford, MA.

Post-Construction Inspection and Maintenance Measures:

Erosion Control

Sedimentation caused from erosion of soils can adversely affect the performance of the storm water management system. The site should be inspected annually for areas that are barren and/or showing signs of erosion and should be stabilized through immediate re-vegetation.

Debris and Litter Removal

Litter and other debris may collect in storm water best management practices (BMPs), potentially causing clogging of facilities. All debris and litter shall be removed as necessary, at a minimum of four (4) times per year in the spring, summer, fall and winter.

Deep Sump and Hooded Catch Basins

In accordance with Volume 2, Chapter 2 of the MassDEP Storm Water Handbook as summarized below:

Inspect or clean deep sump catch basins at least four (4) times per year and at the end of the foliage and snow-removal seasons. Sediments must also be removed four (4) times per year or whenever the depth of deposits is greater than or equal to one-half (1/2) the depth from the invert of the lowest pipe in the basin to the bottom of the basin (the sump). If handling runoff from land uses with higher potential pollutant loads (LUHPPLs) or discharging near or to a critical area, more frequent cleaning may be necessary.

Deep sump and hooded catch basins should be cleaned with vacuum trucks only. Clamshell buckets shall not be used to clean hooded catch basins. Vacuum trucks remove more sediment and supernatant, and are less likely to snap the hood within the deep sump basin.

Always consider the safety of the staff cleaning deep sump catch basins. Cleaning a deep sump catch basin within a road with active traffic or even within a parking lot is dangerous, and a police detail may be necessary to safeguard workers.

Although catch basin debris often contains concentrations of oil and hazardous materials such

as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Unless there is evidence that they have been contaminated by a spill or other means, MassDEP does not routinely require catch basin cleanings to be tested before disposal. Contaminated catch basin cleanings must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as hazardous waste.

In the absence of evidence of contamination, catch basin cleanings may be taken to a landfill or other facility permitted by MassDEP to accept solid waste, without any prior approval by MassDEP. However, some landfills require catch basin cleanings to be tested before they are accepted.

With prior MassDEP approval, catch basin cleanings may be used as grading and shaping materials at landfills undergoing closure (see Revised Guidelines for Determining Closure Activities at Inactive Unlined Landfill Sites) or as daily cover at active landfills. MassDEP also encourages the beneficial reuse of catch basin cleanings whenever possible. A Beneficial Reuse Determination is required for such use.

MassDEP regulations prohibit landfills from accepting materials that contain free-draining liquids. One way to remove liquids is to use a hydraulic lift truck during cleaning operations so that the material can be decanted at the site. After loading material from several catch basins into a truck, elevate the truck so that any free-draining liquid can flow back into the structure. If there is no free water in the truck, the material may be deemed to be sufficiently dry. Otherwise the catch basin cleanings must undergo a Paint Filter Liquids Test. Go to www. Mass.gov/dep/ recycle/laws/cafacts.doc for information on all of the MassDEP requirements pertaining to the disposal of catch basin cleanings.

Sub-Surface Infiltration Basin

In accordance with Volume 2, Chapter 2 of the MassDEP Storm Water Handbook and Manufacturer's recommendations as summarized below:

Inspect inlets at least twice per year.

Good Housekeeping Practices:

Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover:

- All materials stored on-site shall be in a neat, orderly manner in their appropriate containers with original manufacturer's label(s);
- Only store enough material as needed; whenever possible, all of a product shall be used prior to disposing of container;
- Manufacturer, federal, state and local recommendations for proper use and disposal shall be followed.

Vehicle Washing Controls:

- Use commercial car washes whenever possible. Car washes treat and/or recycle wash water;

- Cars shall be washed on gravel, grass or other permeable surfaces to allow filtration to occur;
- Use biodegradable soaps only;
- Use hose nozzles that automatically turn off when unattended.

Routine Inspection and Maintenance of Storm Water BMPs

- Previously addressed.

Spill Prevention and Response Plans

- Spill control practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) Storm Water Pollution Prevention Plan (SWPPP).

Maintenance of Lawns, Gardens and Other Landscaped Areas:

- Grass shall not be cut shorter than two (2) to three (3) inches and mulch clipping should be left on lawns as a natural fertilizer;
- Use low volume water approaches for irrigation such as drip-type or sprinkler systems. Water plants only when needed to enhance root growth and avoid runoff problems;
- Mulch shall be used wherever practicable. Mulch helps retain water and prevents erosion.

Storage and Use of Fertilizers, Herbicides and Pesticides:

- Fertilizers shall be applied in the minimum amounts recommended by the manufacturer. Once applied, fertilizer shall be worked into the soil to limit exposure to storm water. Storage will be in covered areas only. Contents of partially used bags shall be transferred into sealable plastic containers to avoid spills;
- Do not fertilize before or during rain events;
- Consider the use of organic fertilizers;
- Pesticides shall be applied only when necessary and only in the minimum amounts recommended by the manufacturer.

Pet Waste Management

- Scoop up and seal pet waste in plastic bags. Dispose of in garbage.

Solid Waste Management

- All solid waste shall be disposed of or recycled in accordance with all federal, state and local regulations.

List of Emergency Contacts for Plan Implementation

To be determined by Owner.

POST-CONSTRUCTION
OPERATION AND MAINTENANCE LOG

Inspector's Name: _____ Date: _____

Qualifications: _____

_____

Inspection Type: ☐ Routine ☐ Spill ☐ Other: _____

☐ Post-Rainfall (Precipitation in Inches: _____)

BMP	Frequency	Date Last Performed	Comments
Litter and Debris Removal	After Significant Rain Events		
Deep Sump and Hooded Catch Basins	Inspect four (4) times per year Maintenance as necessary		
Particle Separators	Inspect two (2) times per year Maintenance as necessary		
SC-740 Infiltration Chambers	Inspect two (2) times per year		
Vegetated Areas	Inspect as necessary for erosion		

Notes: _____

_____

_____

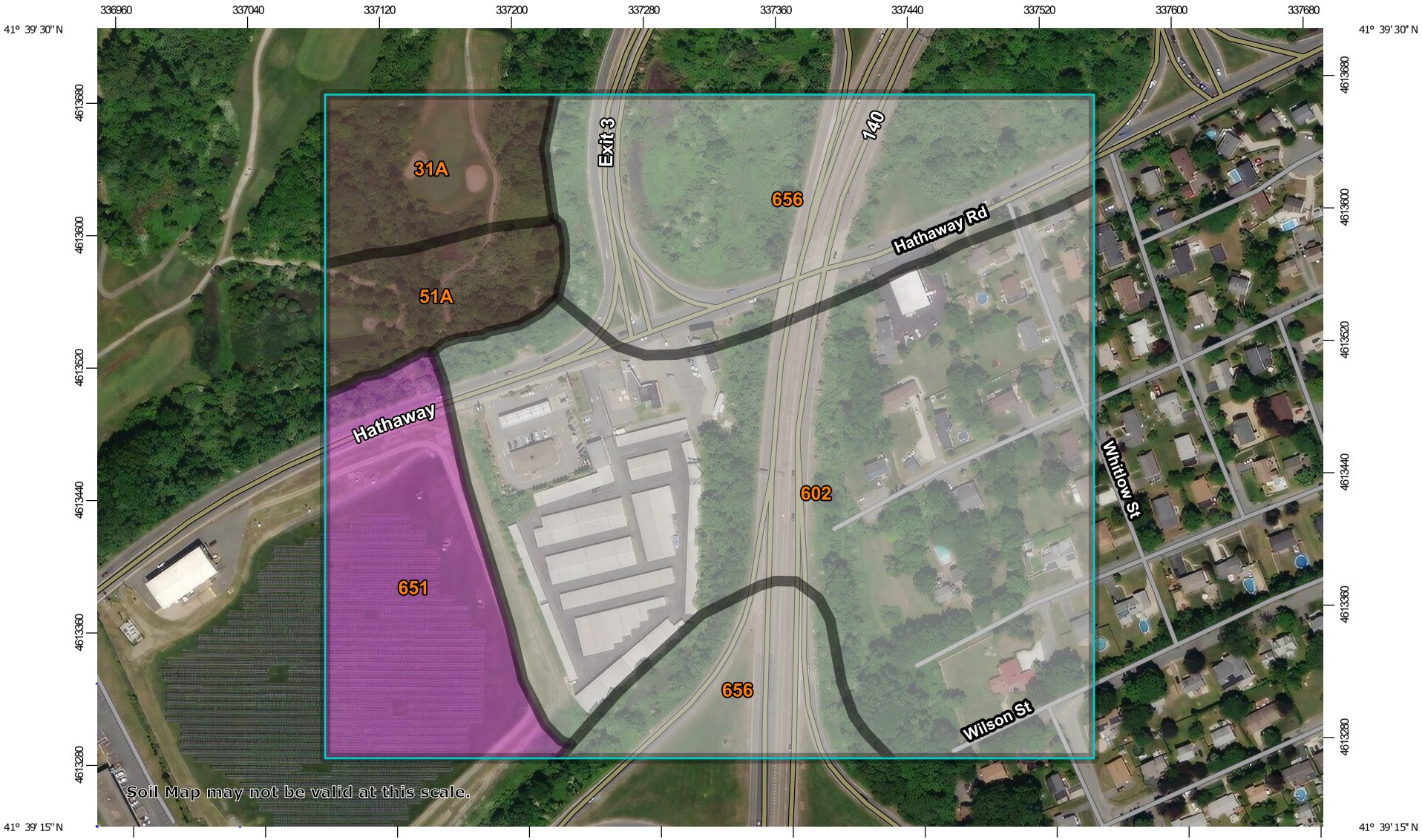
_____

_____

APPENDIX A:

NRCS Soil Mapping and Data

Hydrologic Soil Group—Bristol County, Massachusetts, Southern Part
(366 Hathaway Road - New Bedford, MA)



Map Scale: 1:3,400 if printed on A landscape (11" x 8.5") sheet.

N

0 50 100 200 300 Meters

0 150 300 600 900 Feet

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

MAP LEGEND

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

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Bristol County, Massachusetts, Southern Part
Survey Area Data: Version 14, Jun 9, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Jul 3, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
31A	Walpole sandy loam, 0 to 3 percent slopes	B/D	3.0	6.4%
51A	Swansea muck, 0 to 1 percent slopes	B/D	2.3	5.0%
602	Urban land		22.4	48.2%
651	Udorthents, smoothed	A	5.9	12.8%
656	Udorthents - Urban land complex		12.8	27.6%
Totals for Area of Interest			**46.4**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

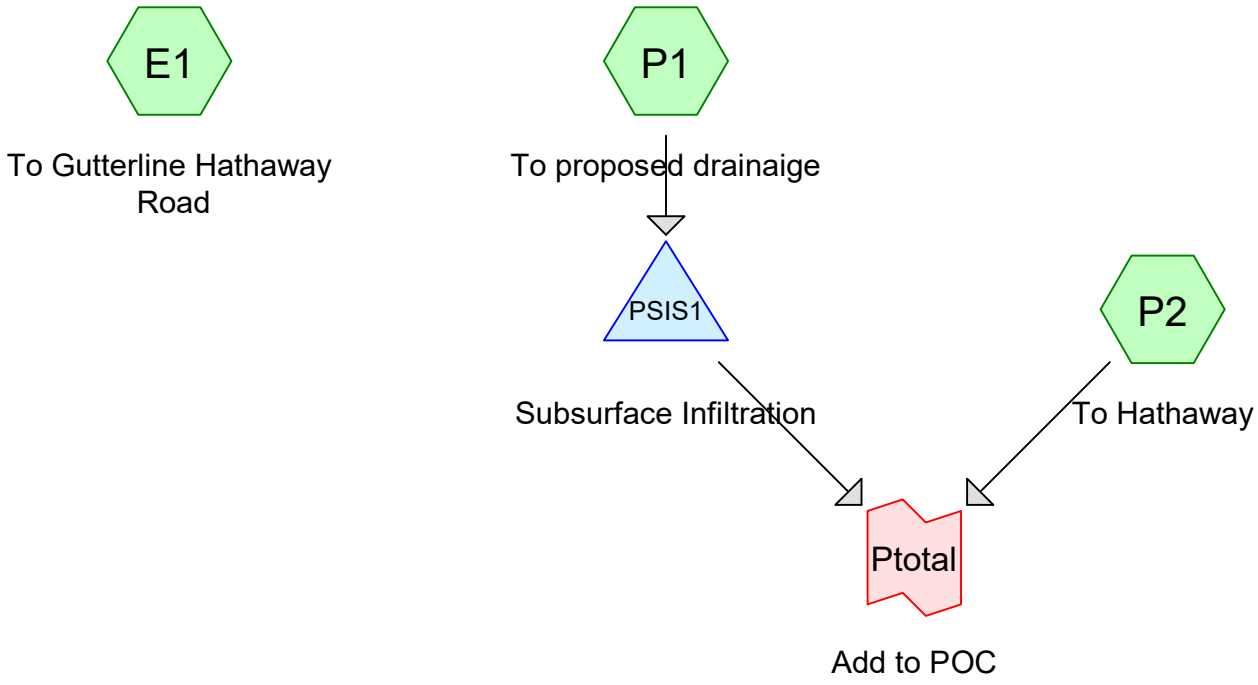
Tie-break Rule: Higher

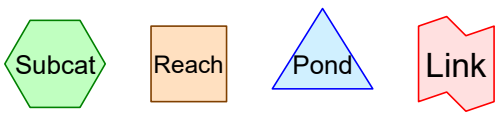
APPENDIX B:

Calculations

Existing Conditions

Proposed Conditions





Routing Diagram for NBD-0002
Prepared by Hayes Engineering, Inc., Printed 8/3/2021

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: To Gutterline Hathaway Road Runoff Area=34,659 sf 85.08% Impervious Runoff Depth=2.55"
Flow Length=385' Tc=6.0 min CN=95 Runoff=2.20 cfs 7,357 cf

Subcatchment P1: To proposed drainaige Runoff Area=24,449 sf 91.44% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=96 Runoff=1.59 cfs 5,400 cf

Subcatchment P2: To Hathaway Runoff Area=10,210 sf 82.11% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=94 Runoff=0.63 cfs 2,082 cf

Pond PSIS1: Subsurface Infiltration Peak Elev=87.65' Storage=962 cf Inflow=1.59 cfs 5,400 cf
Discarded=0.02 cfs 1,540 cf Primary=1.56 cfs 3,571 cf Outflow=1.58 cfs 5,110 cf

Link Ptotal: Add to POC Inflow=2.19 cfs 5,652 cf
Primary=2.19 cfs 5,652 cf

Total Runoff Area = 69,318 sf Runoff Volume = 14,839 cf Average Runoff Depth = 2.57"
13.12% Pervious = 9,092 sf 86.88% Impervious = 60,226 sf

Summary for Subcatchment E1: To Gutterline Hathaway Road

Runoff = 2.20 cfs @ 12.09 hrs, Volume= 7,357 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
3,767	98	Roofs, HSG C
2,187	96	Gravel surface, HSG C
2,984	65	Brush, Good, HSG C
25,721	98	Paved parking, HSG C
34,659	95	Weighted Average
5,171		14.92% Pervious Area
29,488		85.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.0020	0.47		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.10"
1.8	335	0.0230	3.08		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
2.4					**Direct Entry, Min Tc = 0.1h (6.0 min)**
6.0	385	Total			

Summary for Subcatchment P1: To proposed drainaige

Runoff = 1.59 cfs @ 12.09 hrs, Volume= 5,400 cf, Depth= 2.65"
Routed to Pond PSIS1 : Subsurface Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
5,328	98	Roofs, HSG C
2,094	74	>75% Grass cover, Good, HSG C
17,027	98	Paved parking, HSG C
24,449	96	Weighted Average
2,094		8.56% Pervious Area
22,355		91.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Subcatchment P2: To Hathaway

Runoff = 0.63 cfs @ 12.09 hrs, Volume= 2,082 cf, Depth= 2.45"
Routed to Link Ptotal : Add to POC

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.10"

Area (sf)	CN	Description
1,827	74	>75% Grass cover, Good, HSG C
8,383	98	Paved parking, HSG C
10,210	94	Weighted Average
1,827		17.89% Pervious Area
8,383		82.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Pond PSIS1: Subsurface Infiltration

Inflow Area = 24,449 sf, 91.44% Impervious, Inflow Depth = 2.65" for 2 Year event
Inflow = 1.59 cfs @ 12.09 hrs, Volume= 5,400 cf
Outflow = 1.58 cfs @ 12.09 hrs, Volume= 5,110 cf, Atten= 1%, Lag= 0.0 min
Discarded = 0.02 cfs @ 12.09 hrs, Volume= 1,540 cf
Primary = 1.56 cfs @ 12.09 hrs, Volume= 3,571 cf
Routed to Link Ptotal : Add to POC

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 87.65' @ 12.09 hrs Surf.Area= 692 sf Storage= 962 cf

Plug-Flow detention time= 192.3 min calculated for 5,104 cf (95% of inflow)
Center-of-Mass det. time= 163.3 min (938.3 - 775.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	84.50'	504 cf	**11.50'W x 60.16'L x 2.33'H Field A** 1,614 cf Overall - 354 cf Embedded = 1,260 cf x 40.0% Voids
#2A	85.00'	354 cf	**ADS_StormTech SC-310 +Cap** x 24 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 3 Rows
#3	85.00'	94 cf	**4.00'D x 2.50'H Vertical Cone/Cylinder** x 3 -Impervious
#4	87.50'	187 cf	**Area above CB (Conic)** Listed below (Recalc) -Impervious
		1,139 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
87.50	12	0	0	12
88.00	1,000	187	187	1,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**0.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 83.00'
#2	Primary	87.50'	**2.0" x 2.0" Horiz. Orifice/Grate X 7.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (29% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.09 hrs HW=87.65' (Free Discharge)
└**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=1.52 cfs @ 12.09 hrs HW=87.65' (Free Discharge)
└**2=Orifice/Grate** (Weir Controls 1.52 cfs @ 1.27 fps)

Summary for Link Ptotal: Add to POC

Inflow Area = 34,659 sf, 88.69% Impervious, Inflow Depth = 1.96" for 2 Year event
Inflow = 2.19 cfs @ 12.09 hrs, Volume= 5,652 cf
Primary = 2.19 cfs @ 12.09 hrs, Volume= 5,652 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: To Gutterline Hathaway Road Runoff Area=34,659 sf 85.08% Impervious Runoff Depth=4.02"
Flow Length=385' Tc=6.0 min CN=95 Runoff=3.38 cfs 11,621 cf

Subcatchment P1: To proposed drainaige Runoff Area=24,449 sf 91.44% Impervious Runoff Depth=4.14"
Tc=6.0 min CN=96 Runoff=2.42 cfs 8,425 cf

Subcatchment P2: To Hathaway Runoff Area=10,210 sf 82.11% Impervious Runoff Depth=3.91"
Tc=6.0 min CN=94 Runoff=0.98 cfs 3,330 cf

Pond PSIS1: Subsurface Infiltration Peak Elev=87.70' Storage=972 cf Inflow=2.42 cfs 8,425 cf
Discarded=0.02 cfs 1,629 cf Primary=2.38 cfs 6,492 cf Outflow=2.39 cfs 8,121 cf

Link Ptotal: Add to POC Inflow=3.36 cfs 9,822 cf
Primary=3.36 cfs 9,822 cf

Total Runoff Area = 69,318 sf Runoff Volume = 23,376 cf Average Runoff Depth = 4.05"
13.12% Pervious = 9,092 sf 86.88% Impervious = 60,226 sf

Summary for Subcatchment E1: To Gutterline Hathaway Road

Runoff = 3.38 cfs @ 12.09 hrs, Volume= 11,621 cf, Depth= 4.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
3,767	98	Roofs, HSG C
2,187	96	Gravel surface, HSG C
2,984	65	Brush, Good, HSG C
25,721	98	Paved parking, HSG C
34,659	95	Weighted Average
5,171		14.92% Pervious Area
29,488		85.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.0020	0.47		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.10"
1.8	335	0.0230	3.08		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
2.4					**Direct Entry, Min Tc = 0.1h (6.0 min)**
6.0	385	Total			

Summary for Subcatchment P1: To proposed drainaige

Runoff = 2.42 cfs @ 12.09 hrs, Volume= 8,425 cf, Depth= 4.14"
Routed to Pond PSIS1 : Subsurface Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
5,328	98	Roofs, HSG C
2,094	74	>75% Grass cover, Good, HSG C
17,027	98	Paved parking, HSG C
24,449	96	Weighted Average
2,094		8.56% Pervious Area
22,355		91.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Subcatchment P2: To Hathaway

Runoff = 0.98 cfs @ 12.09 hrs, Volume= 3,330 cf, Depth= 3.91"
Routed to Link Ptotal : Add to POC

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.60"

Area (sf)	CN	Description
1,827	74	>75% Grass cover, Good, HSG C
8,383	98	Paved parking, HSG C
10,210	94	Weighted Average
1,827		17.89% Pervious Area
8,383		82.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Pond PSIS1: Subsurface Infiltration

Inflow Area = 24,449 sf, 91.44% Impervious, Inflow Depth = 4.14" for 10 Year event
Inflow = 2.42 cfs @ 12.09 hrs, Volume= 8,425 cf
Outflow = 2.39 cfs @ 12.09 hrs, Volume= 8,121 cf, Atten= 1%, Lag= 0.1 min
Discarded = 0.02 cfs @ 12.09 hrs, Volume= 1,629 cf
Primary = 2.38 cfs @ 12.09 hrs, Volume= 6,492 cf
Routed to Link Ptotal : Add to POC

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 87.70' @ 12.09 hrs Surf.Area= 692 sf Storage= 972 cf

Plug-Flow detention time= 133.4 min calculated for 8,110 cf (96% of inflow)
Center-of-Mass det. time= 112.9 min (877.3 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	84.50'	504 cf	**11.50'W x 60.16'L x 2.33'H Field A** 1,614 cf Overall - 354 cf Embedded = 1,260 cf x 40.0% Voids
#2A	85.00'	354 cf	**ADS_StormTech SC-310 +Cap** x 24 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 3 Rows
#3	85.00'	94 cf	**4.00'D x 2.50'H Vertical Cone/Cylinder** x 3 -Impervious
#4	87.50'	187 cf	**Area above CB (Conic)** Listed below (Recalc) -Impervious
		1,139 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
87.50	12	0	0	12
88.00	1,000	187	187	1,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**0.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 83.00'
#2	Primary	87.50'	**2.0" x 2.0" Horiz. Orifice/Grate X 7.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (29% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.09 hrs HW=87.70' (Free Discharge)
1=Exfiltration (Controls 0.02 cfs)

Primary OutFlow Max=2.34 cfs @ 12.09 hrs HW=87.70' (Free Discharge)
2=Orifice/Grate (Weir Controls 2.34 cfs @ 1.46 fps)

Summary for Link Ptotal: Add to POC

Inflow Area = 34,659 sf, 88.69% Impervious, Inflow Depth = 3.40" for 10 Year event
Inflow = 3.36 cfs @ 12.09 hrs, Volume= 9,822 cf
Primary = 3.36 cfs @ 12.09 hrs, Volume= 9,822 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: To Gutterline Hathaway Road Runoff Area=34,659 sf 85.08% Impervious Runoff Depth=4.82"
Flow Length=385' Tc=6.0 min CN=95 Runoff=4.01 cfs 13,910 cf

Subcatchment P1: To proposed drainaige Runoff Area=24,449 sf 91.44% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=96 Runoff=2.86 cfs 10,045 cf

Subcatchment P2: To Hathaway Runoff Area=10,210 sf 82.11% Impervious Runoff Depth=4.70"
Tc=6.0 min CN=94 Runoff=1.17 cfs 4,001 cf

Pond PSIS1: Subsurface Infiltration Peak Elev=87.74' Storage=982 cf Inflow=2.86 cfs 10,045 cf
Discarded=0.02 cfs 1,665 cf Primary=2.78 cfs 7,994 cf Outflow=2.80 cfs 9,660 cf

Link Ptotal: Add to POC Inflow=3.95 cfs 11,996 cf
Primary=3.95 cfs 11,996 cf

Total Runoff Area = 69,318 sf Runoff Volume = 27,956 cf Average Runoff Depth = 4.84"
13.12% Pervious = 9,092 sf 86.88% Impervious = 60,226 sf

Summary for Subcatchment E1: To Gutterline Hathaway Road

Runoff = 4.01 cfs @ 12.09 hrs, Volume= 13,910 cf, Depth= 4.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.40"

Area (sf)	CN	Description
3,767	98	Roofs, HSG C
2,187	96	Gravel surface, HSG C
2,984	65	Brush, Good, HSG C
25,721	98	Paved parking, HSG C
34,659	95	Weighted Average
5,171		14.92% Pervious Area
29,488		85.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.0020	0.47		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.10"
1.8	335	0.0230	3.08		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
2.4					**Direct Entry, Min Tc = 0.1h (6.0 min)**
6.0	385	Total			

Summary for Subcatchment P1: To proposed drainaige

Runoff = 2.86 cfs @ 12.09 hrs, Volume= 10,045 cf, Depth= 4.93"
Routed to Pond PSIS1 : Subsurface Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.40"

Area (sf)	CN	Description
5,328	98	Roofs, HSG C
2,094	74	>75% Grass cover, Good, HSG C
17,027	98	Paved parking, HSG C
24,449	96	Weighted Average
2,094		8.56% Pervious Area
22,355		91.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Subcatchment P2: To Hathaway

Runoff = 1.17 cfs @ 12.09 hrs, Volume= 4,001 cf, Depth= 4.70"
Routed to Link Ptotal : Add to POC

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.40"

Area (sf)	CN	Description
1,827	74	>75% Grass cover, Good, HSG C
8,383	98	Paved parking, HSG C
10,210	94	Weighted Average
1,827		17.89% Pervious Area
8,383		82.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Pond PSIS1: Subsurface Infiltration

Inflow Area = 24,449 sf, 91.44% Impervious, Inflow Depth = 4.93" for 25 Year event
Inflow = 2.86 cfs @ 12.09 hrs, Volume= 10,045 cf
Outflow = 2.80 cfs @ 12.09 hrs, Volume= 9,660 cf, Atten= 2%, Lag= 0.1 min
Discarded = 0.02 cfs @ 12.09 hrs, Volume= 1,665 cf
Primary = 2.78 cfs @ 12.09 hrs, Volume= 7,994 cf
Routed to Link Ptotal : Add to POC

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 87.74' @ 12.09 hrs Surf.Area= 692 sf Storage= 982 cf

Plug-Flow detention time= 122.9 min calculated for 9,660 cf (96% of inflow)
Center-of-Mass det. time= 99.9 min (860.5 - 760.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	84.50'	504 cf	**11.50'W x 60.16'L x 2.33'H Field A** 1,614 cf Overall - 354 cf Embedded = 1,260 cf x 40.0% Voids
#2A	85.00'	354 cf	**ADS_StormTech SC-310 +Cap** x 24 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 3 Rows
#3	85.00'	94 cf	**4.00'D x 2.50'H Vertical Cone/Cylinder** x 3 -Impervious
#4	87.50'	187 cf	**Area above CB (Conic)** Listed below (Recalc) -Impervious
		1,139 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
87.50	12	0	0	12
88.00	1,000	187	187	1,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**0.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 83.00'
#2	Primary	87.50'	**2.0" x 2.0" Horiz. Orifice/Grate X 7.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (29% open area) Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.09 hrs HW=87.74' (Free Discharge)
└**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=2.73 cfs @ 12.09 hrs HW=87.74' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 2.73 cfs @ 2.34 fps)

Summary for Link Ptotal: Add to POC

Inflow Area = 34,659 sf, 88.69% Impervious, Inflow Depth = 4.15" for 25 Year event
Inflow = 3.95 cfs @ 12.09 hrs, Volume= 11,996 cf
Primary = 3.95 cfs @ 12.09 hrs, Volume= 11,996 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs

Time span=0.00-40.00 hrs, dt=0.05 hrs, 801 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E1: To Gutterline Hathaway Road Runoff Area=34,659 sf 85.08% Impervious Runoff Depth=5.91"
Flow Length=385' Tc=6.0 min CN=95 Runoff=4.87 cfs 17,065 cf

Subcatchment P1: To proposed drainaige Runoff Area=24,449 sf 91.44% Impervious Runoff Depth=6.03"
Tc=6.0 min CN=96 Runoff=3.46 cfs 12,276 cf

Subcatchment P2: To Hathaway Runoff Area=10,210 sf 82.11% Impervious Runoff Depth=5.79"
Tc=6.0 min CN=94 Runoff=1.42 cfs 4,928 cf

Pond PSIS1: Subsurface Infiltration Peak Elev=87.84' Storage=1,021 cf Inflow=3.46 cfs 12,276 cf
Discarded=0.02 cfs 1,707 cf Primary=3.28 cfs 10,211 cf Outflow=3.30 cfs 11,918 cf

Link Ptotal: Add to POC Inflow=4.69 cfs 15,139 cf
Primary=4.69 cfs 15,139 cf

Total Runoff Area = 69,318 sf Runoff Volume = 34,269 cf Average Runoff Depth = 5.93"
13.12% Pervious = 9,092 sf 86.88% Impervious = 60,226 sf

Summary for Subcatchment E1: To Gutterline Hathaway Road

Runoff = 4.87 cfs @ 12.09 hrs, Volume= 17,065 cf, Depth= 5.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (sf)	CN	Description
3,767	98	Roofs, HSG C
2,187	96	Gravel surface, HSG C
2,984	65	Brush, Good, HSG C
25,721	98	Paved parking, HSG C
34,659	95	Weighted Average
5,171		14.92% Pervious Area
29,488		85.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.8	50	0.0020	0.47		**Sheet Flow, Sheet** Smooth surfaces n= 0.011 P2= 3.10"
1.8	335	0.0230	3.08		**Shallow Concentrated Flow, Shallow** Paved Kv= 20.3 fps
2.4					**Direct Entry, Min Tc = 0.1h (6.0 min)**
6.0	385	Total			

Summary for Subcatchment P1: To proposed drainaige

Runoff = 3.46 cfs @ 12.09 hrs, Volume= 12,276 cf, Depth= 6.03"
Routed to Pond PSIS1 : Subsurface Infiltration

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (sf)	CN	Description
5,328	98	Roofs, HSG C
2,094	74	>75% Grass cover, Good, HSG C
17,027	98	Paved parking, HSG C
24,449	96	Weighted Average
2,094		8.56% Pervious Area
22,355		91.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Subcatchment P2: To Hathaway

Runoff = 1.42 cfs @ 12.09 hrs, Volume= 4,928 cf, Depth= 5.79"
Routed to Link Ptotal : Add to POC

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 Year Rainfall=6.50"

Area (sf)	CN	Description
1,827	74	>75% Grass cover, Good, HSG C
8,383	98	Paved parking, HSG C
10,210	94	Weighted Average
1,827		17.89% Pervious Area
8,383		82.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Min. Tc = 0.1h**

Summary for Pond PSIS1: Subsurface Infiltration

Inflow Area = 24,449 sf, 91.44% Impervious, Inflow Depth = 6.03" for 100 Year event
Inflow = 3.46 cfs @ 12.09 hrs, Volume= 12,276 cf
Outflow = 3.30 cfs @ 12.10 hrs, Volume= 11,918 cf, Atten= 5%, Lag= 0.9 min
Discarded = 0.02 cfs @ 12.10 hrs, Volume= 1,707 cf
Primary = 3.28 cfs @ 12.10 hrs, Volume= 10,211 cf
Routed to Link Ptotal : Add to POC

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 87.84' @ 12.10 hrs Surf.Area= 692 sf Storage= 1,021 cf

Plug-Flow detention time= 101.0 min calculated for 11,903 cf (97% of inflow)
Center-of-Mass det. time= 84.1 min (840.6 - 756.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	84.50'	504 cf	**11.50'W x 60.16'L x 2.33'H Field A** 1,614 cf Overall - 354 cf Embedded = 1,260 cf x 40.0% Voids
#2A	85.00'	354 cf	**ADS_StormTech SC-310 +Cap** x 24 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 24 Chambers in 3 Rows
#3	85.00'	94 cf	**4.00'D x 2.50'H Vertical Cone/Cylinder** x 3 -Impervious
#4	87.50'	187 cf	**Area above CB (Conic)** Listed below (Recalc) -Impervious
		1,139 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
87.50	12	0	0	12
88.00	1,000	187	187	1,000

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**0.270 in/hr Exfiltration over Wetted area** Conductivity to Groundwater Elevation = 83.00'
#2	Primary	87.50'	**2.0" x 2.0" Horiz. Orifice/Grate X 7.00 columns** X 6 rows C= 0.600 in 24.0" x 24.0" Grate (29% open area) Limited to weir flow at low heads

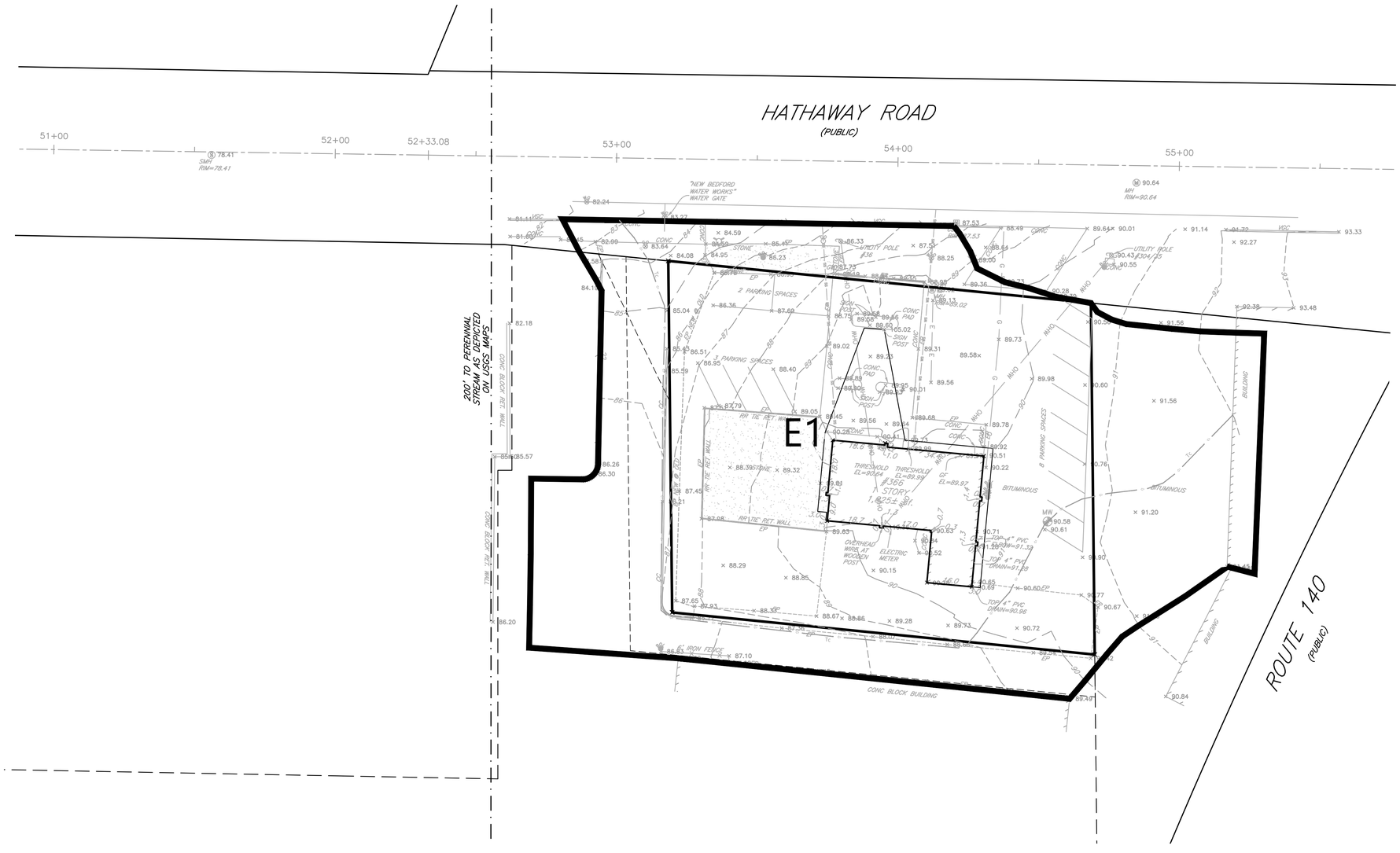
Discarded OutFlow Max=0.02 cfs @ 12.10 hrs HW=87.84' (Free Discharge)
└**1=Exfiltration** (Controls 0.02 cfs)

Primary OutFlow Max=3.27 cfs @ 12.10 hrs HW=87.84' (Free Discharge)
└**2=Orifice/Grate** (Orifice Controls 3.27 cfs @ 2.80 fps)

Summary for Link Ptotal: Add to POC

Inflow Area = 34,659 sf, 88.69% Impervious, Inflow Depth = 5.24" for 100 Year event
Inflow = 4.69 cfs @ 12.10 hrs, Volume= 15,139 cf
Primary = 4.69 cfs @ 12.10 hrs, Volume= 15,139 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-40.00 hrs, dt= 0.05 hrs



Prepared For:

Applicant
BEACON COMPASSION
12 POST OFFICE SQUARE
6TH FLOOR
BOSTON, MASS. 02109

Prepared By:

Hayes Engineering, Inc.
603 Salem Street
Wakefield, MA 01880
Phone: 781.246.2800
Fax: 781.246.7596
www.hayeseng.com

Design By: AMC
Drawn By: AMC
Checked By: PJO
Project File: NBD-0002
Comp. No: NBD2
☒ Issued For Permit
☐ Issued For Review
☐ Issued For Bid
☐ Issued For Construction
☒ Not For Construction

No.	Revision	Date
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Scale: 1" = 20'
0' 10' 20' 40'
Date: August 2, 2021

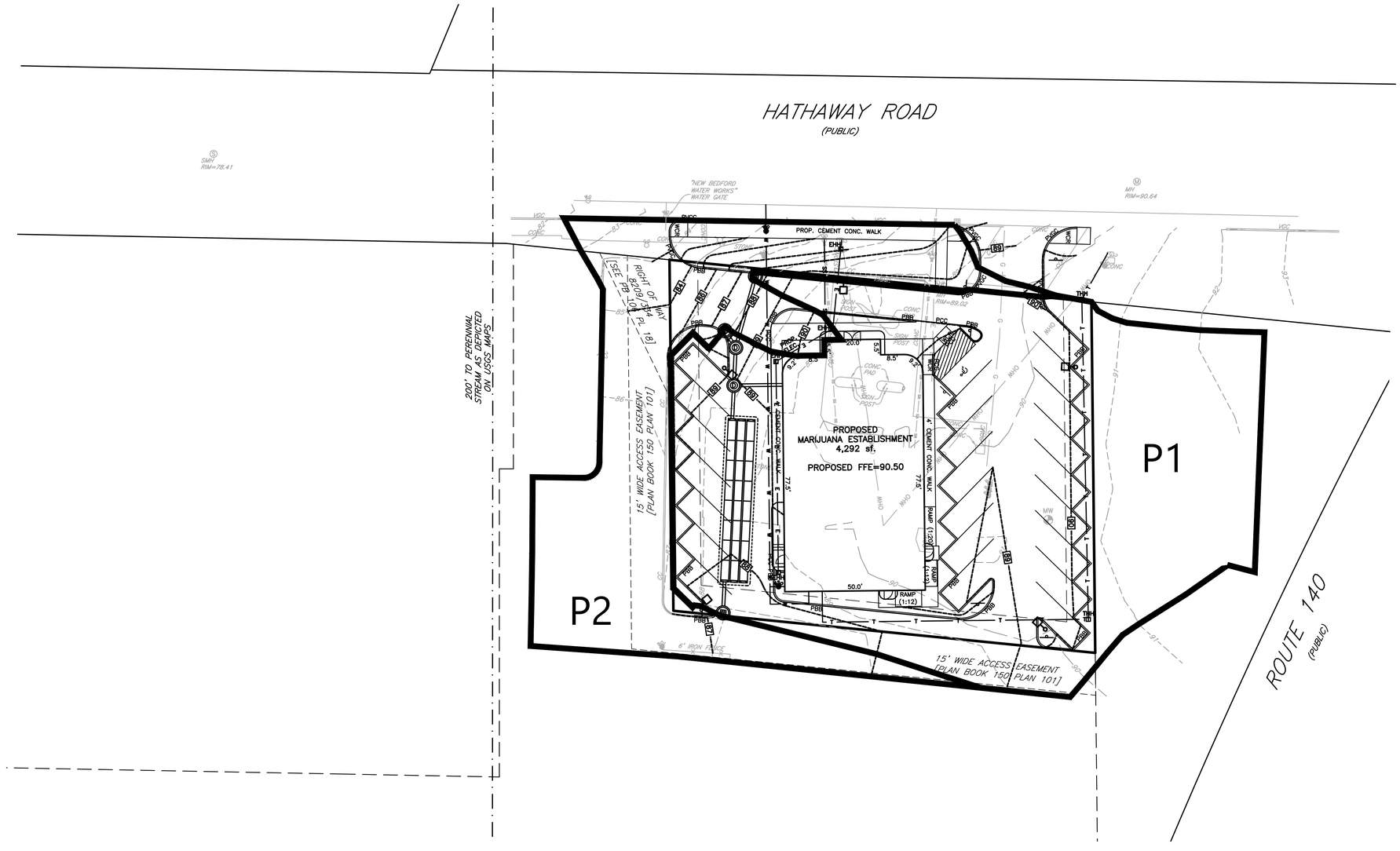
Drawing Title:
EXISTING WATERSHED MAP
366 HATHAWAY ROAD
PROPOSED MARIJUANA ESTABLISHMENT
NEW BEDFORD, MASS.

Seal:

Drawing No.:
WS1

SHEET 1 OF 2

N:\NBD2\SP_366hathaway-MSPCS.dwg, 8/3/2021 8:51:16 AM, TC



Prepared For:

Applicant
BEACON COMPASSION
12 POST OFFICE SQUARE
6TH FLOOR
BOSTON, MASS. 02109

Prepared By:

Hayes Engineering, Inc.
603 Salem Street
Wakefield, MA 01880
Phone: 781.246.2800
Fax: 781.246.7596
www.hayeseng.com

Design By: AMC
Drawn By: AMC
Checked By: PJO
Project File: NBD-0002
Comp. No: NBD2

- [x] Issued For Permit
- [ ] Issued For Review
- [ ] Issued For Bid
- [ ] Issued For Construction
- [x] Not For Construction

No.	Revision	Date
10		
9		
8		
7		
6		
5		
4		
3		
2		
1		

Scale: 1"=20'
0' 10' 20' 40'

Date: August 2, 2021

Drawing Title:

PROPOSED WATERSHED MAP
366 HATHAWAY ROAD
PROPOSED MARIJUANA ESTABLISHMENT
NEW BEDFORD, MASS.

Seal:

Drawing No.:

WS2

SHEET 2 OF 2

N:\NBD21SP_366hathaway-MSPCS.dwg, 8/3/2021 8:51:19 AM, TC