STORMWATER ANALYSIS

FOR

22-24 Main Street

Maynard, Mass.

PREPARED FOR:

GreenStar Herbals

Date: June 4, 2019

Places Associates, Inc.

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GreenStar Herbals
22-25 Main Street
Maynard, MA

Stormwater Analysis – Executive Summary

The proposal calls for the redevelopment of an existing commercial property with a change of use from warehouse and a commercial kitchen to a retail use. The existing building will remain with modifications to the parking area resulting in a net reduction in impervious area on the site. The decrease in the amount of impervious area onsite to complies with the requirements of redevelopment under the MADEP stormwater standards.

Redevelopment is defined under 310CMR 10.04

> *Redevelopment means replacement, rehabilitation, or expansion of existing structures, improvement of existing roads or reuse of degraded or previously developed areas for purposes of 310 CMR 10.58, governing work in the riverfront area. For purpose of the Stormwater Management Standards as provided in 310 CMR 10.05(6)(k) through (q), redevelopment is defined to include the following projects:*
> *(a) maintenance and improvement of existing roadways including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems and repaving;*
> *(b) development, rehabilitation, expansion and phased projects on previously developed sites provided the redevelopment results in no net increase in impervious area; and*
> *(c) remedial projects specifically designed to provide improved stormwater management such as projects to separate storm drains and sanitary sewers and stormwater retrofit projects.*

Under current conditions stormwater is collected into three existing catchbasins which discharge towards the Assabet River. All discharge outlets are within 100' of the river and are within the 100 year flood plain. These catchbasins do not provide any pre-treatment and do not have any oil and grease trap hoods.

The proposal calls for the reconfiguration of the existing parking lot within the confines of the existing pavement. There will be two new landscaped areas at the entrance to the building which will convert 635 s.f. of impervious pavement to a pervious planted area. The drainage system will be improved to the extent practicable by adding oil and grease trap hoods to the 3 catchbasins and by creating a 2,800 s.f. raingarden at the discharge point for the westerly catchbasin improving the water quality of the runoff.

The rain garden area will be created on the southerly side of the existing parking area where there currently is Japanese Knotweed, an invasive species. In order to remove the Japanese Knotweed without the application of herbicides, the soil mass must be removed for proper disposal and replaced with new, invasive free topsoil. The rain garden will be constructed in accordance with DEP standards and will be created by excavating soil as the area is within the flood plain so there will be no negative impact on the flood plain storage. The rain garden will be located approximately 35' from the edge of pavement to allow for snow storage and to allow filtration of snow melt prior to the rain garden.

The design is in compliance with the MADEP stormwater management standards as described in Chapter 3 of the Stormwater Handbook.

BMP's utilized:

- Deep sump catchbasins
- Vegetative Filter Strip
- Bioretention Area/Rain Garden

Introduction

Excerpt from MADEP Stormwater Management Standards Chapter 1:

In 1996, the Massachusetts Department of Environmental Protection (the "Department" or "MassDEP") issued the Stormwater Policy that established Stormwater Management Standards aimed at encouraging recharge and preventing stormwater discharges from causing or contributing to the pollution of the surface waters and groundwaters of the Commonwealth. In 1997, MassDEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy. MassDEP has revised the Stormwater Management Standards and Massachusetts Stormwater Handbook to promote increased stormwater recharge, the treatment of more runoff from polluting land uses, low impact development (LID) techniques, pollution prevention, the removal of illicit discharges to stormwater management systems, and improved operation and maintenance of stormwater best management practices (BMPs). MassDEP applies the Stormwater Management Standards pursuant to its authority under the Wetlands Protection Act, M.G.L. c. 131, § 40, and the Massachusetts Clean Waters Act, M.G.L .c. 21, §§ 26-53. The revised Stormwater Management Standards have been incorporated in the Wetlands Protection Act Regulations, 310 CMR 10.05(6)(k) and the Water Quality Certification Regulations, 314 CMR 9.06(6)(a).

Stormwater runoff results from rainfall and snow melt and represents the single largest source responsible for water quality impairments in the Commonwealth's rivers, lakes, ponds, and marine waters. New and existing development typically adds impervious surfaces and, if not properly managed, may alter natural drainage features, increase peak discharge rates and volumes, reduce recharge to wetlands and streams, and increase the discharge of pollutants to wetlands and water bodies.

The Stormwater Management Standards address water quality (pollutants) and water quantity (flooding, low base flow and recharge) by establishing standards that require the implementation of a wide variety of stormwater management strategies. These strategies include environmentally sensitive site design and LID techniques to minimize impervious surface and land disturbance, source control and pollution prevention, structural BMPs, construction period erosion and sedimentation control, and the long-term operation and maintenance of stormwater management systems.

Redevelopment – Volume 1 Chapter 1
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 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. (Page 2)

For purposes of the Stormwater Management Standards, redevelopment projects are defined to include the following....Development, rehabilitation, expansion and phased projects on previously developed sites, provided the redevelopment results in no net increase in impervious area. (page 20)

The maximum extent practicable standard applies to the 80% TSS removal requirement of Standards 4 through 6. For redevelopment projects, stormwater management system must be designed to remove 80% of TSS only to the maximum extent practicable. ***The maximum extent practicable standard also applies to redevelopment projects with existing stormwater discharges to Zone Is, Zone As, Outstanding Resource Waters, and Special Resource Waters subject to Standard 6*** *(foot note 33, page 21)*

Narrative – Existing Conditions

The existing site is located on the southerly side of Main Street and directly abuts the Assabet River. The site is fully developed with a building constructed approximately 1940 and paved parking. The impervious areas of the site comprise approximately 38,883 s.f. of the one acre site (about 90%).

The existing parking lot slopes towards the Assabet River at approximately 5% slope and it drained with three existing catchbasins. None of the catchbasins are equipped with any oil or grease hood. The catchbasins in front of the building discharge via a drain line running adjacent to the easterly side of the building where it discharges to the Assabet River. The third catchbasin, located at the southerly side of the existing parking lot, discharges into an open area, approximately 47' from the wetlands adjacent to the Assabet River in an area with invasive Japanese Knotweed.

Soils in the area analyzed are mapped as Urban Land and Water (Assabet River). On site observations along the river bank indicate a loamy sand so drainage calculations are considering the pervious portions of the site to be a Hydrologic Group B soil.

Narrative – Proposed Conditions

The proposal calls for the re-configuration of the parking lot and the removal of 635 s.f. of pavement to create landscaped islands at the building entrance, resulting in a net decrease in impervious surfaces. All required parking for the proposed use by GreenStar Herbals will be within the existing pavement.

This project meets the definition of a "re-development project" with no increase in impervious surfaces. Further decreases are not possible due to the number of parking spaces required and existing concrete pads and ramps which are not practicable to remove. The change in use to a retail use from both the warehouse use and commercial kitchen will eliminate outside deliveries at the loading dock and the potential for spills. GreenStar's deliveries are highly controlled and will consist of small deliveries of products unloaded inside the building.

The drainage system will be improved to the extent practicable by adding oil and grease trap hoods to the 3 catchbasins and by creating a 2,800 s.f. raingarden at the discharge point for the westerly catchbasin improving the water quality of the runoff.

The rain garden area will be created on the southerly side of the existing parking area where there currently is Japanese Knotweed, an invasive species. In order to remove the Japanese Knotweed without the application of herbicides, the soil mass must be removed for proper disposal and replaced with new, invasive free topsoil. The rain garden will be constructed in accordance with DEP standards and will be created by excavating soil as the area is within the flood plain so as to not impact any flood storage. The rain garden will be located approximately 35' from the edge of pavement to allow for snow storage and to allow filtration of snow melt prior to the rain garden, similar in function as a vegetated filter strip.

The discharge from catchbasins 1 and 2, discharges via a pipe on the easterly side of the building to the river. Due to the close proximity of the building and property line, there is no space to modify this outfall.

Documenting Compliance

Standard 1 - No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

There will be no new outfalls and the addition of the oil and grease trap hoods and rain garden will provide additional treatment to the runoff over existing conditions.

Standard 2 - Stormwater management systems shall be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates...To prevent storm damage and downstream and off-site flooding, Standard 2 requires that the post-development peak discharge rate is equal to or less than the pre-development rate from the 2-year and the 10-year 24-hour storms...Proponents must also evaluate the impact of peak discharges from the 100-year 24-hour storm. If this evaluation shows that increased off-site flooding will result from peak discharges from the 100-year 24-hour storms, BMPs must also be provided to attenuate these discharges.

Summary of Runoff Rates

Rainfall Event	Pre	Post	Comment
2 Year	2.42	1.60	
10 Year	3.76	3.65	
25 Year	4.83	4.71	
100 Year	7.04	6.96	Storage below 100 yr flood plain

The minor reduction of impervious surfaces in combination with the storage in the rain garden will result in a small decrease in the rate of runoff for the smaller rainfall events.

Standard 3 - Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including 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.

Existing impervious area = 38,883 s.f. = 0.892 acres
Proposed impervious area = 38,248 s.f. = 0.878 acres

There is a net decrease in impervious areas resulting in no loss of annual recharge to groundwater. The replacement of heavily compacted soils adjacent to the parking lot with fresh, invasive root-free soil, will improve the recharge 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).

Improvements to water quality are proposed to the extent practicable. The discharge from catchbasin 3 results in 90% TSS removal (Bioretention/Rain Garden with pre-treatment – Vegetative strip). Improvements to the treatment train from catchbasin 1 and 2 consists of the addition of an oil and grease trap hood. Other BMPs are not practicable due to lack of space.

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.

Not applicable to this site.

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. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

The site is not near or tributary to a critical area.

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

The project is being filed as a redevelopment project and has a reduction in the overall impervious area and represents an improvement to existing conditions. The design is in compliance with all MADEP stormwater standards to the extent practicable.

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 site is less than the 1 acre required for a SWPPP. Plans indicate that the existing catchbasins are to be cleaned and have Inlet Sediment Control Devices installed prior to construction. Erosion control barriers are to be installed as shown on the plan set

Standard 9 - A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

See the Operation and Maintenance Plan included in this document.

Standard 10 - All illicit discharges to the stormwater management system are prohibited.

Illicit Discharge Compliance Statement

To the best of my knowledge no illicit discharges currently exist on the site and no future illicit discharge will be allowed, including wastewater discharges and discharges of stormwater contaminated by contact with process wastes, raw materials, toxic pollutants, hazardous substances, oil, or grease.

Signature of Owner Date

To be completed and submitted prior to the start of construction.

Stormwater Operation and Maintenance Plan - Long Term Pollution Prevention

Ongoing maintenance is required for the proper function of the stormwater management system allowing the system prevent pollution for the long term. This document provides a guideline for this work and allows for record keeping.

Stormwater Management System Owner: GreenStar Herbals
Party Responsible for Maintenance: Manager for GreenStar Herbals.

Snow Removal

Snow removal from private property will be the responsibility of the property owner. Snow should not be plowed or stockpiled in resource areas.

Preliminary Stormwater O&M Maintenance Budget

Inspection and maintenance = $500 x 4 times per year = $2,000±

Site Specific BMP Maintenance Plans

(Reference MADEP Volume 2, Chapter – Structural BMP Specifications for the Massachusetts Stormwater Handbook)

Catchbasins

Inspect or clean catch basins four times per year at the end of the foliage and snow removal seasons. Sediments must also be removed four times per year or when the depth of deposits is greater than or equal to one half the depth from the bottom of the lowest pipe in the basin. Vacuum trucks are to be used to remove trapped sediment and supernatant. Although catch basin debris often contains concentrations of oil and hazardous materials such as petroleum hydrocarbons and metals, MassDEP classifies them as solid waste. Any contaminated materials must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.00, and handled as hazardous waste. MassDEP regulations prohibit landfills from accepting materials that contain free draining liquids.

Vegetated Filter Strip (land between parking area and Rain Garden)

Regular maintenance is critical for filter strips to be effective and to ensure that flow does not short circuit the system. Conduct semi-annual inspections during the first year (and annually thereafter). Inspect the level spreader for sediment buildup and the vegetation for signs of erosion, bare spots, and overall health. Bi-annual mowing of the wildflowers is required. Remove sediment from the toe of slope and reseed bare spots as necessary.

Periodically, remove sediment that accumulates near the top of the strip to maintain the appropriate slope and prevent formation of a "berm" that could impede the distribution of runoff as sheet flow. When the filter strip is located in the buffer zone to a wetland resource area, the operation and maintenance plan must include strict measures to ensure that maintenance operations do not alter the wetland resource areas.

Rain Garden/Bioretention Area

Premature failure of Bioretention areas is a significant issue caused by lack of regular maintenance. Ensuring long-term maintenance involves sustained public education and deed restrictions or covenants for privately owned cells. Bioretention areas require careful attention while plants are being established and seasonal landscaping maintenance thereafter.

In many cases, a landscaping contractor working elsewhere on the site can complete maintenance tasks. Inspect pretreatment devices and Bioretention cells regularly for sediment build-up, structural damage, and standing water. Inspect soil and repair eroded areas monthly. Re-mulch void areas as needed. Remove litter and debris monthly.

Treat diseased vegetation as needed. Remove and replace dead vegetation twice per year (spring and fall). Proper selection of plant species and support during establishment of vegetation should minimize—if not eliminate—the need for fertilizers and pesticides. Remove invasive species as needed to prevent these species from spreading into the bioretention area. Replace mulch every two years, in the early spring. Upon failure, excavate bioretention area, scarify bottom and sides, replace filter fabric and soil, replant, and mulch.

Because the soil medium filters contaminants from runoff, the cation exchange capacity of the soil media will eventually be exhausted. When the cation exchange capacity of the soil media decreases, change the soil media to prevent contaminants from migrating to the groundwater, or from being discharged via an underdrain outlet. Using small shrubs and plants instead of larger trees will make it easier to replace the media with clean material when needed.

Plant maintenance is critical. Concentrated salts in roadway runoff may kill plants, necessitating removal of dead vegetation each spring and replanting. The operation and maintenance plan must include measures to make sure the plants are maintained. This is particularly true in residential subdivisions, where the operation and maintenance plan may assign each homeowner the legal responsibility to maintain a bioretention cell or rain garden on his or her property. Including the requirement in the property deed for new subdivisions may alert residential property owners to their legal responsibilities regarding the bioretention cells constructed on their lot.

Rain Garden/Bioretention Maintenance Schedule

Activity	*Time of Year Frequency*
Inspect & remove trash	Year round Monthly
Mulch Spring	Annually
Remove dead vegetation	Fall or Spring Annually
Replace dead vegetation	Spring Annually
Prune	Spring or Fall Annually
Replace entire media & all vegetation	Late Spring/early Summer As needed*

** Paying careful attention to pretreatment and operation & maintenance can extend the life of the soil media*

Stormwater BMP Inspection and Maintenance Log
(print a log for each BMP and maintain a log book for the project)

BMP:_____

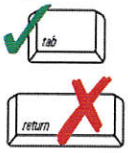
Date	Inspector	Issues Observed	Corrective Action Taken	Notes

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

Susan Carter 6/4/19

Signature and Date

Checklist

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

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

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

Standard 1: No New Untreated Discharges

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☐ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

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

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

☐ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

☐ Site is comprised solely of C and D soils and/or bedrock at the land surface

☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000

☐ Solid Waste Landfill pursuant to 310 CMR 19.000

☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

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

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

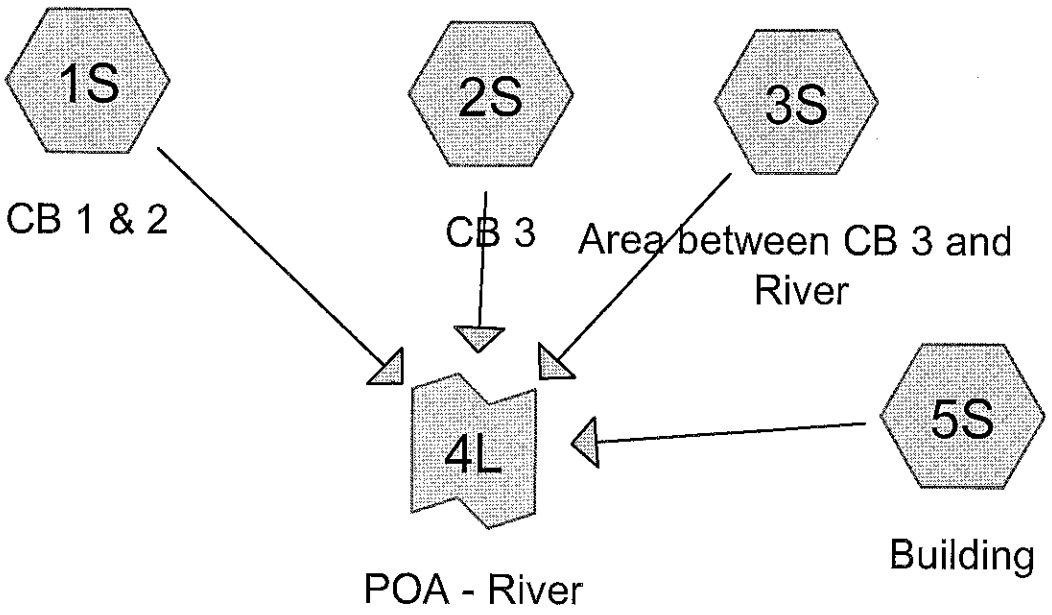
- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

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

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.



Subcat Reach Pond Link

Routing Diagram for 5390 Maynard Pre-development
Prepared by Places Associates, Inc.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.013	69	50-75% Grass cover, Fair, HSG B (1S)
0.119	56	Brush, Fair, HSG B (3S)
0.544	98	Paved parking, HSG B (1S, 2S)
0.349	98	Roofs, HSG B (5S)
1.025	**93**	**TOTAL AREA**

Time span=3.00-30.00 hrs, dt=0.05 hrs, 541 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 1S: CB 1 & 2 Runoff Area=12,020 sf 95.37% Impervious Runoff Depth>2.73"
Tc=6.0 min CN=97 Runoff=0.73 cfs 0.063 af

Subcatchment 2S: CB 3 Runoff Area=12,230 sf 100.00% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=98 Runoff=0.75 cfs 0.066 af

Subcatchment 3S: Area between CB 3 and Runoff Area=5,200 sf 0.00% Impervious Runoff Depth=0.25"
Tc=6.0 min CN=56 Runoff=0.01 cfs 0.002 af

Subcatchment 5S: Building Runoff Area=15,190 sf 100.00% Impervious Runoff Depth>2.83"
Tc=6.0 min CN=98 Runoff=0.94 cfs 0.082 af

Link 4L: POA - River Inflow=2.42 cfs 0.214 af
Primary=2.42 cfs 0.214 af

Total Runoff Area = 1.025 ac Runoff Volume = 0.214 af Average Runoff Depth = 2.50"
12.90% Pervious = 0.132 ac 87.10% Impervious = 0.893 ac

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 0.73 cfs @ 12.13 hrs, Volume= 0.063 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
11,463	98	Paved parking, HSG B
557	69	50-75% Grass cover, Fair, HSG B
12,020	97	Weighted Average
557		4.63% Pervious Area
11,463		95.37% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 0.75 cfs @ 12.13 hrs, Volume= 0.066 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
12,230	98	Paved parking, HSG B
12,230		100.00% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.01 cfs @ 12.21 hrs, Volume= 0.002 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 0.94 cfs @ 12.13 hrs, Volume= 0.082 af, Depth> 2.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 87.10% Impervious, Inflow Depth > 2.50" for 2-Year event
Inflow = 2.42 cfs @ 12.13 hrs, Volume= 0.214 af
Primary = 2.42 cfs @ 12.13 hrs, Volume= 0.214 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs

Time span=3.00-30.00 hrs, dt=0.05 hrs, 541 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 1S: CB 1 & 2 Runoff Area=12,020 sf 95.37% Impervious Runoff Depth>4.25"
Tc=6.0 min CN=97 Runoff=1.11 cfs 0.098 af

Subcatchment 2S: CB 3 Runoff Area=12,230 sf 100.00% Impervious Runoff Depth>4.34"
Tc=6.0 min CN=98 Runoff=1.14 cfs 0.102 af

Subcatchment 3S: Area between CB 3 and Runoff Area=5,200 sf 0.00% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=56 Runoff=0.09 cfs 0.009 af

Subcatchment 5S: Building Runoff Area=15,190 sf 100.00% Impervious Runoff Depth>4.34"
Tc=6.0 min CN=98 Runoff=1.42 cfs 0.126 af

Link 4L: POA - River Inflow=3.76 cfs 0.334 af
Primary=3.76 cfs 0.334 af

Total Runoff Area = 1.025 ac Runoff Volume = 0.334 af Average Runoff Depth = 3.91"
12.90% Pervious = 0.132 ac 87.10% Impervious = 0.893 ac

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 1.11 cfs @ 12.13 hrs, Volume= 0.098 af, Depth> 4.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
11,463	98	Paved parking, HSG B
557	69	50-75% Grass cover, Fair, HSG B
12,020	97	Weighted Average
557		4.63% Pervious Area
11,463		95.37% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 1.14 cfs @ 12.13 hrs, Volume= 0.102 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
12,230	98	Paved parking, HSG B
12,230		100.00% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.09 cfs @ 12.14 hrs, Volume= 0.009 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.126 af, Depth> 4.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 87.10% Impervious, Inflow Depth > 3.91" for 10-Year event
Inflow = 3.76 cfs @ 12.13 hrs, Volume= 0.334 af
Primary = 3.76 cfs @ 12.13 hrs, Volume= 0.334 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs

Time span=3.00-30.00 hrs, dt=0.05 hrs, 541 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 1S: CB 1 & 2 Runoff Area=12,020 sf 95.37% Impervious Runoff Depth>5.44"
Tc=6.0 min CN=97 Runoff=1.41 cfs 0.125 af

Subcatchment 2S: CB 3 Runoff Area=12,230 sf 100.00% Impervious Runoff Depth>5.52"
Tc=6.0 min CN=98 Runoff=1.44 cfs 0.129 af

Subcatchment 3S: Area between CB 3 and Runoff Area=5,200 sf 0.00% Impervious Runoff Depth=1.52"
Tc=6.0 min CN=56 Runoff=0.18 cfs 0.015 af

Subcatchment 5S: Building Runoff Area=15,190 sf 100.00% Impervious Runoff Depth>5.52"
Tc=6.0 min CN=98 Runoff=1.79 cfs 0.160 af

Link 4L: POA - River Inflow=4.83 cfs 0.429 af
Primary=4.83 cfs 0.429 af

Total Runoff Area = 1.025 ac Runoff Volume = 0.429 af Average Runoff Depth = 5.03"
12.90% Pervious = 0.132 ac 87.10% Impervious = 0.893 ac

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 1.41 cfs @ 12.13 hrs, Volume= 0.125 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
11,463	98	Paved parking, HSG B
557	69	50-75% Grass cover, Fair, HSG B
12,020	97	Weighted Average
557		4.63% Pervious Area
11,463		95.37% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 1.44 cfs @ 12.13 hrs, Volume= 0.129 af, Depth> 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
12,230	98	Paved parking, HSG B
12,230		100.00% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.015 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 1.79 cfs @ 12.13 hrs, Volume= 0.160 af, Depth> 5.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 87.10% Impervious, Inflow Depth > 5.03" for 25-Year event
Inflow = 4.83 cfs @ 12.13 hrs, Volume= 0.429 af
Primary = 4.83 cfs @ 12.13 hrs, Volume= 0.429 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs

Time span=3.00-30.00 hrs, dt=0.05 hrs, 541 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 1S: CB 1 & 2 Runoff Area=12,020 sf 95.37% Impervious Runoff Depth>7.84"
Tc=6.0 min CN=97 Runoff=2.02 cfs 0.180 af

Subcatchment 2S: CB 3 Runoff Area=12,230 sf 100.00% Impervious Runoff Depth>7.91"
Tc=6.0 min CN=98 Runoff=2.06 cfs 0.185 af

Subcatchment 3S: Area between CB 3 and Runoff Area=5,200 sf 0.00% Impervious Runoff Depth=3.15"
Tc=6.0 min CN=56 Runoff=0.40 cfs 0.031 af

Subcatchment 5S: Building Runoff Area=15,190 sf 100.00% Impervious Runoff Depth>7.91"
Tc=6.0 min CN=98 Runoff=2.56 cfs 0.230 af

Link 4L: POA - River Inflow=7.04 cfs 0.627 af
Primary=7.04 cfs 0.627 af

Total Runoff Area = 1.025 ac Runoff Volume = 0.627 af Average Runoff Depth = 7.34"
12.90% Pervious = 0.132 ac 87.10% Impervious = 0.893 ac

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 2.02 cfs @ 12.13 hrs, Volume= 0.180 af, Depth> 7.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
11,463	98	Paved parking, HSG B
557	69	50-75% Grass cover, Fair, HSG B
12,020	97	Weighted Average
557		4.63% Pervious Area
11,463		95.37% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 2.06 cfs @ 12.13 hrs, Volume= 0.185 af, Depth> 7.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
12,230	98	Paved parking, HSG B
12,230		100.00% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 2.56 cfs @ 12.13 hrs, Volume= 0.230 af, Depth> 7.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

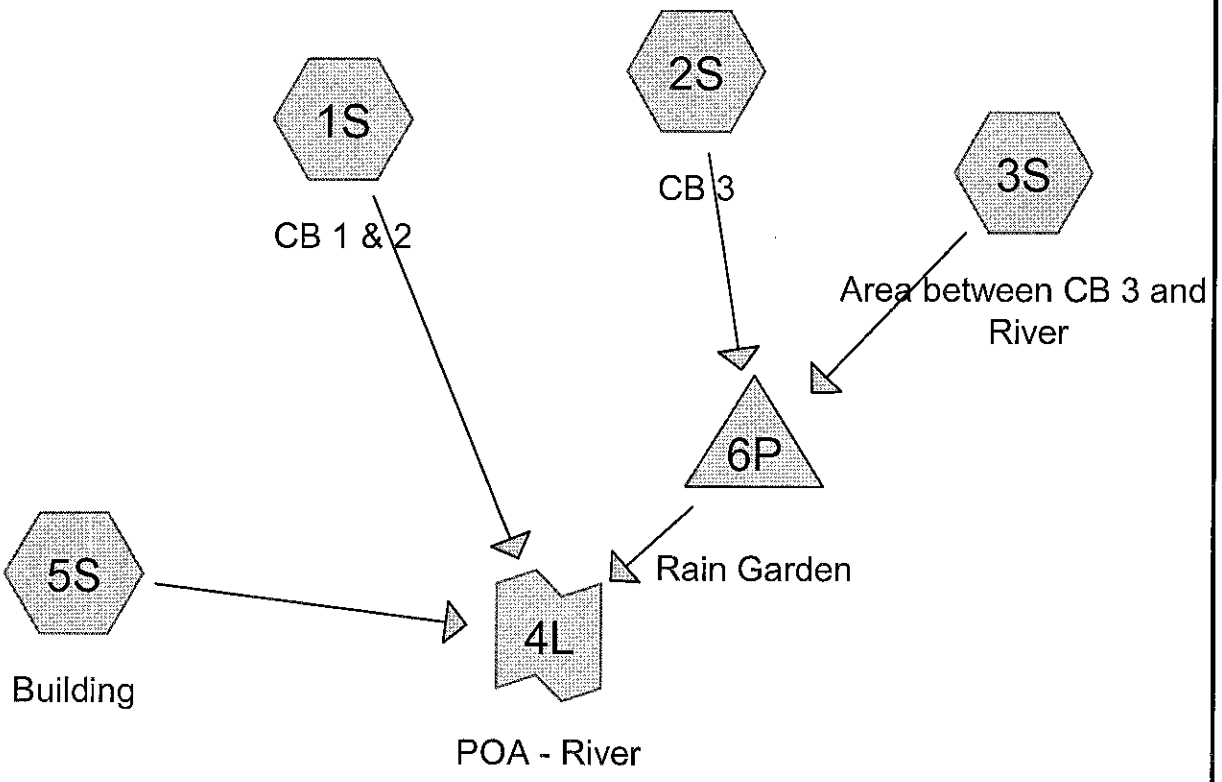
Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 87.10% Impervious, Inflow Depth > 7.34" for 100-Year event
Inflow = 7.04 cfs @ 12.13 hrs, Volume= 0.627 af
Primary = 7.04 cfs @ 12.13 hrs, Volume= 0.627 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 3.00-30.00 hrs, dt= 0.05 hrs



Subcat Reach Pond Link

Routing Diagram for 5390 Maynard Post-development
Prepared by Places Associates, Inc.

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.029	69	50-75% Grass cover, Fair, HSG B (1S, 2S)
0.119	56	Brush, Fair, HSG B (3S)
0.528	98	Paved parking, HSG B (1S, 2S)
0.349	98	Roofs, HSG B (5S)
1.025	**92**	**TOTAL AREA**

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 0.71 cfs @ 12.13 hrs, Volume= 0.059 af, Depth= 2.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
11,005	98	Paved parking, HSG B
1,192	69	50-75% Grass cover, Fair, HSG B
12,197	95	Weighted Average
1,192		9.77% Pervious Area
11,005		90.23% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 0.74 cfs @ 12.13 hrs, Volume= 0.066 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
12,002	98	Paved parking, HSG B
60	69	50-75% Grass cover, Fair, HSG B
12,062	98	Weighted Average
60		0.50% Pervious Area
12,002		99.50% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.01 cfs @ 12.21 hrs, Volume= 0.002 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 0.94 cfs @ 12.13 hrs, Volume= 0.083 af, Depth> 2.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.09"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Pond 6P: Rain Garden

Inflow Area = 0.396 ac, 69.53% Impervious, Inflow Depth > 2.07" for 2-Year event
Inflow = 0.75 cfs @ 12.13 hrs, Volume= 0.068 af
Outflow = 0.41 cfs @ 12.23 hrs, Volume= 0.035 af, Atten= 46%, Lag= 6.4 min
Primary = 0.41 cfs @ 12.23 hrs, Volume= 0.035 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 146.86' @ 12.23 hrs Surf.Area= 1,268 sf Storage= 1,510 cf

Plug-Flow detention time= 319.3 min calculated for 0.035 af (52% of inflow)
Center-of-Mass det. time= 161.8 min (933.9 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	1,688 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	407	0	0
146.00	814	611	611
147.00	1,340	1,077	1,688

Device	Routing	Invert	Outlet Devices
#1	Primary	146.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.39 cfs @ 12.23 hrs HW=146.86' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 0.39 cfs @ 0.63 fps)

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 85.55% Impervious, Inflow Depth > 2.08" for 2-Year event
Inflow = 1.60 cfs @ 12.13 hrs, Volume= 0.177 af
Primary = 1.60 cfs @ 12.13 hrs, Volume= 0.177 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 1.11 cfs @ 12.13 hrs, Volume= 0.095 af, Depth> 4.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
11,005	98	Paved parking, HSG B
1,192	69	50-75% Grass cover, Fair, HSG B
12,197	95	Weighted Average
1,192		9.77% Pervious Area
11,005		90.23% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 1.13 cfs @ 12.13 hrs, Volume= 0.101 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
12,002	98	Paved parking, HSG B
60	69	50-75% Grass cover, Fair, HSG B
12,062	98	Weighted Average
60		0.50% Pervious Area
12,002		99.50% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.09 cfs @ 12.14 hrs, Volume= 0.009 af, Depth= 0.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.127 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.65"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Pond 6P: Rain Garden

Inflow Area = 0.396 ac, 69.53% Impervious, Inflow Depth > 3.33" for 10-Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 0.110 af
Outflow = 1.16 cfs @ 12.15 hrs, Volume= 0.077 af, Atten= 5%, Lag= 1.4 min
Primary = 1.16 cfs @ 12.15 hrs, Volume= 0.077 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 146.93' @ 12.15 hrs Surf.Area= 1,302 sf Storage= 1,592 cf

Plug-Flow detention time= 231.2 min calculated for 0.077 af (70% of inflow)
Center-of-Mass det. time= 108.9 min (879.1 - 770.3)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	1,688 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	407	0	0
146.00	814	611	611
147.00	1,340	1,077	1,688

Device	Routing	Invert	Outlet Devices
#1	Primary	146.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.15 cfs @ 12.15 hrs HW=146.93' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 1.15 cfs @ 0.91 fps)

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 85.55% Impervious, Inflow Depth > 3.51" for 10-Year event
Inflow = 3.65 cfs @ 12.13 hrs, Volume= 0.299 af
Primary = 3.65 cfs @ 12.13 hrs, Volume= 0.299 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 1.41 cfs @ 12.13 hrs, Volume= 0.123 af, Depth> 5.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
11,005	98	Paved parking, HSG B
1,192	69	50-75% Grass cover, Fair, HSG B
12,197	95	Weighted Average
1,192		9.77% Pervious Area
11,005		90.23% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 1.42 cfs @ 12.13 hrs, Volume= 0.129 af, Depth> 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
12,002	98	Paved parking, HSG B
60	69	50-75% Grass cover, Fair, HSG B
12,062	98	Weighted Average
60		0.50% Pervious Area
12,002		99.50% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.18 cfs @ 12.14 hrs, Volume= 0.015 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 1.79 cfs @ 12.13 hrs, Volume= 0.162 af, Depth> 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=5.87"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Pond 6P: Rain Garden

Inflow Area = 0.396 ac, 69.53% Impervious, Inflow Depth > 4.36" for 25-Year event
Inflow = 1.60 cfs @ 12.13 hrs, Volume= 0.144 af
Outflow = 1.54 cfs @ 12.15 hrs, Volume= 0.111 af, Atten= 4%, Lag= 1.3 min
Primary = 1.54 cfs @ 12.15 hrs, Volume= 0.111 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 146.95' @ 12.15 hrs Surf.Area= 1,316 sf Storage= 1,626 cf

Plug-Flow detention time= 196.4 min calculated for 0.111 af (77% of inflow)
Center-of-Mass det. time= 91.8 min (861.6 - 769.8)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	1,688 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	407	0	0
146.00	814	611	611
147.00	1,340	1,077	1,688

Device	Routing	Invert	Outlet Devices
#1	Primary	146.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.53 cfs @ 12.15 hrs HW=146.95' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 1.53 cfs @ 1.00 fps)

Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 85.55% Impervious, Inflow Depth > 4.64" for 25-Year event
Inflow = 4.71 cfs @ 12.13 hrs, Volume= 0.397 af
Primary = 4.71 cfs @ 12.13 hrs, Volume= 0.397 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Summary for Subcatchment 1S: CB 1 & 2

Runoff = 2.03 cfs @ 12.13 hrs, Volume= 0.180 af, Depth> 7.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
11,005	98	Paved parking, HSG B
1,192	69	50-75% Grass cover, Fair, HSG B
12,197	95	Weighted Average
1,192		9.77% Pervious Area
11,005		90.23% Impervious Area

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

Summary for Subcatchment 2S: CB 3

Runoff = 2.03 cfs @ 12.13 hrs, Volume= 0.185 af, Depth> 8.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
12,002	98	Paved parking, HSG B
60	69	50-75% Grass cover, Fair, HSG B
12,062	98	Weighted Average
60		0.50% Pervious Area
12,002		99.50% Impervious Area

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

Summary for Subcatchment 3S: Area between CB 3 and River

Runoff = 0.40 cfs @ 12.13 hrs, Volume= 0.031 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
5,200	56	Brush, Fair, HSG B
5,200		100.00% Pervious Area

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

Summary for Subcatchment 5S: Building

Runoff = 2.56 cfs @ 12.13 hrs, Volume= 0.233 af, Depth> 8.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 100-Year Rainfall=8.36"

Area (sf)	CN	Description
15,190	98	Roofs, HSG B
15,190		100.00% Impervious Area

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

Summary for Pond 6P: Rain Garden

Inflow Area = 0.396 ac, 69.53% Impervious, Inflow Depth > 6.56" for 100-Year event
Inflow = 2.43 cfs @ 12.13 hrs, Volume= 0.216 af
Outflow = 2.41 cfs @ 12.15 hrs, Volume= 0.184 af, Atten= 1%, Lag= 1.1 min
Primary = 2.41 cfs @ 12.15 hrs, Volume= 0.184 af

Routing by Dyn-Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 147.01' @ 12.15 hrs Surf.Area= 1,340 sf Storage= 1,688 cf

Plug-Flow detention time= 149.5 min calculated for 0.183 af (85% of inflow)
Center-of-Mass det. time= 71.0 min (840.2 - 769.2)

Volume	Invert	Avail.Storage	Storage Description
#1	145.00'	1,688 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
145.00	407	0	0
146.00	814	611	611
147.00	1,340	1,077	1,688

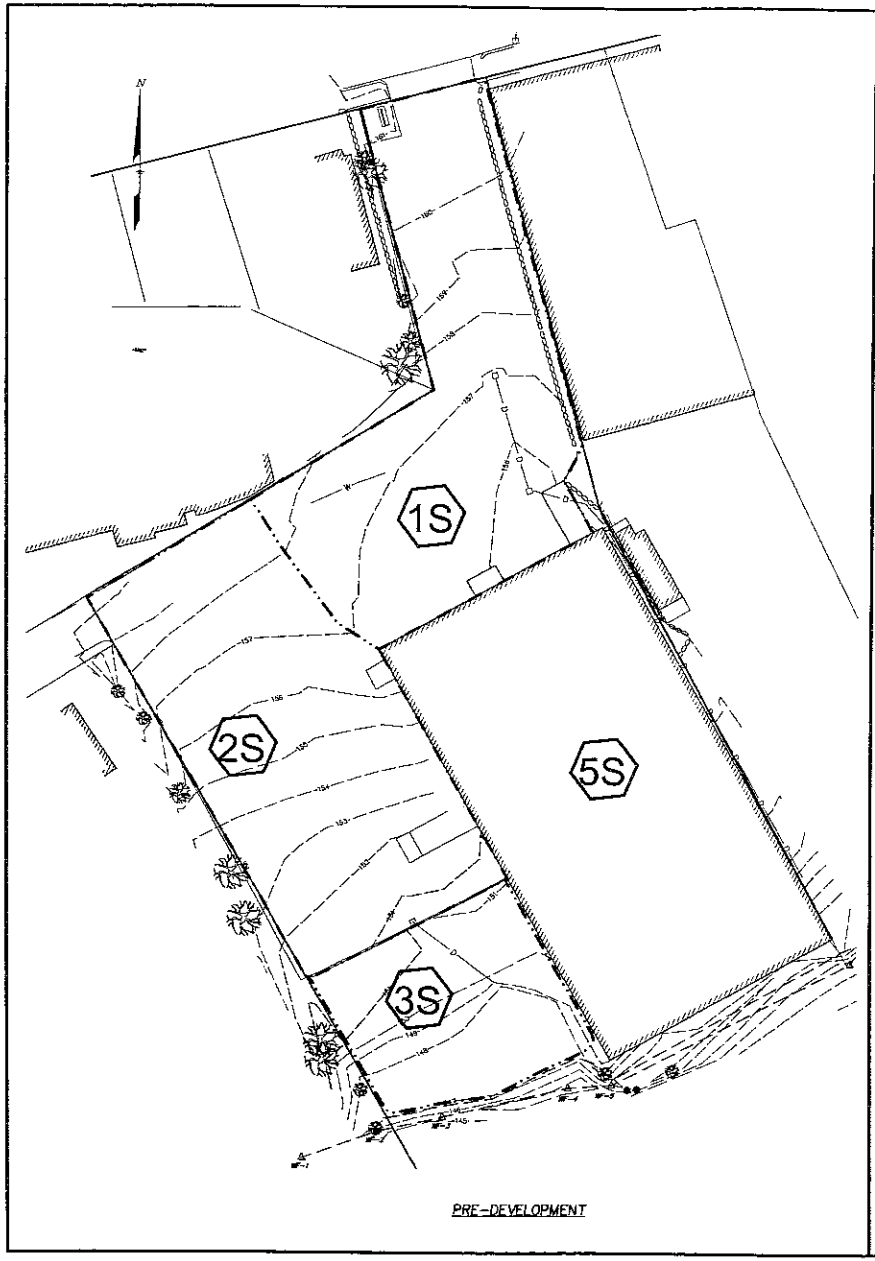
Device	Routing	Invert	Outlet Devices
#1	Primary	146.80'	**10.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=2.38 cfs @ 12.15 hrs HW=147.01' TW=0.00' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 2.38 cfs @ 1.15 fps)

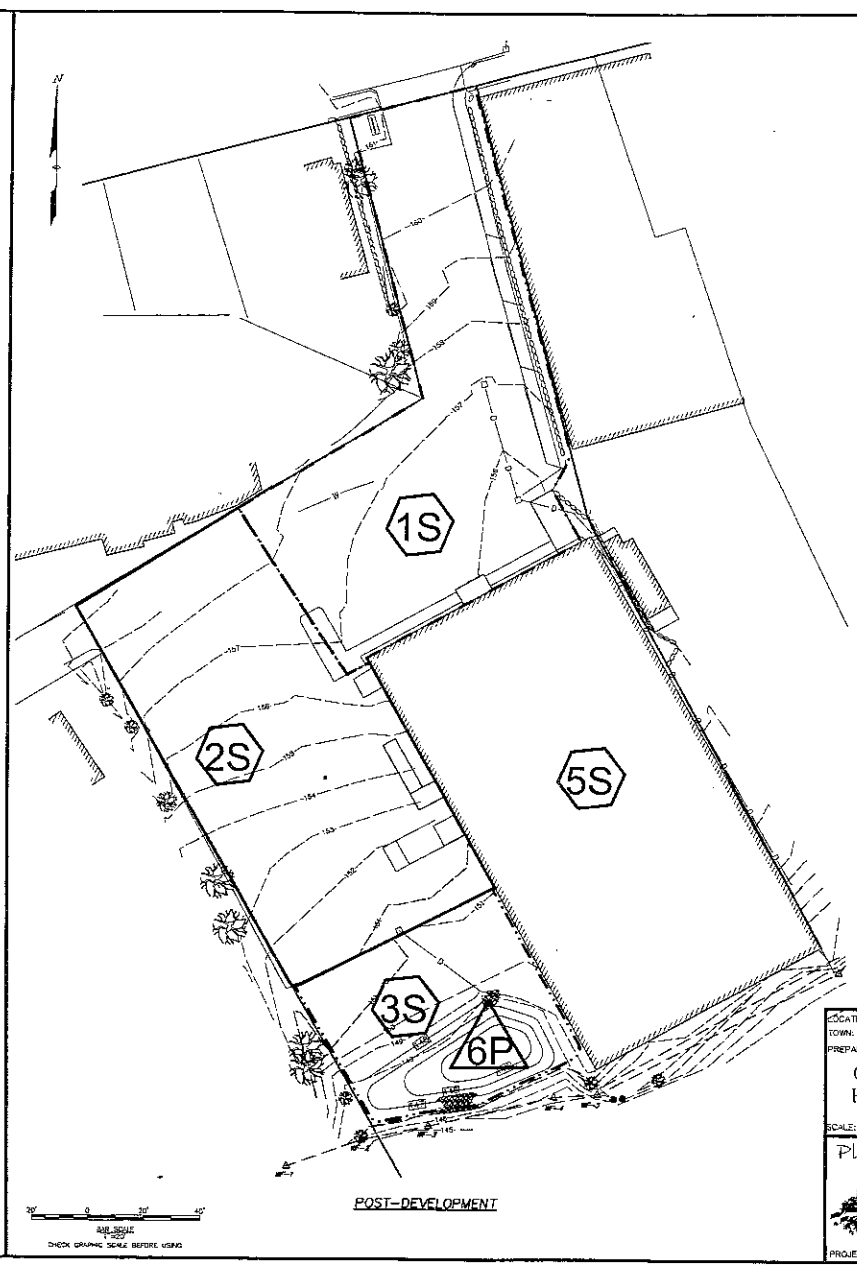
Summary for Link 4L: POA - River

Inflow Area = 1.025 ac, 85.55% Impervious, Inflow Depth > 6.99" for 100-Year event
Inflow = 6.96 cfs @ 12.13 hrs, Volume= 0.597 af
Primary = 6.96 cfs @ 12.13 hrs, Volume= 0.597 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs



PRE-DEVELOPMENT



POST-DEVELOPMENT

MAYNARD PLANNING BOARD

APPROVAL DATE

ENDORSEMENT DATE

PERMIT SET
5-30-2019(REV)

DRAINAGE PLANS

LOCATION: 22-24 MAIN STREET
TOWN: MAYNARD, MASSACHUSETTS
PREPARED FOR:
GreenStar HERBALS

SCALE: AS NOTED
DATE: MARCH 28, 2019

Places Associates, Inc.
Planning, Landscape Architecture, Civil Engineering, Surveying
256 GREAT ROAD, SUITE 4
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PROJECT No.: 5390
PLAN No. DRAIN