DRAINAGE REPORT

For

PROPOSED

"EARLY EDUCATION CENTER"

0 Blue Hill Avenue
Milton, Massachusetts
Norfolk County

Prepared by:

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BOHLER

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I. EXECUTIVE SUMMARY

This report examines the changes in drainage that can be expected as the result of the development of a proposed early education childcare facility located on the westerly side of Blue Hill Avenue in the Town of Milton, Massachusetts. The site, which contains approximately 6.88 acres of land, is undeveloped consisting of wooded areas.

The proposed project includes the construction of a new 16,200± sf freestanding Gardener School early education childcare facility along with new paved parking areas, landscaping, stormwater management components, and associated utilities. This report addresses a comparative analysis of the pre- and post-development site runoff conditions. Additionally, this report provides calculations documenting the design of the proposed stormwater conveyance/management system as illustrated within the accompanying Site Development Plans prepared by Bohler. The project will also provide erosion and sedimentation controls during the demolition and construction periods, as well as long term stabilization of the site.

For the purposes of this analysis the pre- and post-development drainage conditions were analyzed at one (1) "design point" where stormwater runoff currently drains to under existing conditions. This design point is described in further detail in **Section II** below. A summary of the existing and proposed conditions peak runoff rates and volumes for the 2-, 10-, 25-, and 100-year storms can be found in **Table 1.1** below. In addition, the project has been designed to meet or exceed the Stormwater Management Standards as detailed herein.

Table 1.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP-1	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	2.53	2.51	**-0.02**

**Flows are represented in cubic feet per second (cfs)*

II. EXISTING SITE CONDITIONS

Existing Site Description

The site consists of approximately 6.88 acres of land located along the westerly side of Blue Hill Avenue in the Town of Milton, Massachusetts. The site is undeveloped consisting of wooded areas.

On-Site Soil Information

Soils within the analyzed area consist of the following as classified by the Natural Resource Conservation Service (NRCS):

Table 2.1: Existing Soil Information

Soil Unit Symbol	Soil Name / Description	Hydrologic Soil Group (HSG)
31A	Walpole sandy loam	D
253D	Hinckley loamy sand	A
254C	Merrimac fine sandy loam	A
305D	Paxton fine sandy loam	C
310B	Woodbridge fine sandy loam	C

Initial onsite soil testing was performed by Whitestone Associates, Inc. on June 26th, 2024 and additional testing was performed in August and will be performed in September but has not yet been summarized. Refer to **Appendix C** for additional information.

Existing Collection and Conveyance

The site generally drains west to east towards a drainage depression at the southeast property corner prior to discharging into the Blue Hill Avenue municipal drainage system. Elevations on the site range from 63 feet at the southeast property corner to 135 feet along the northern property boundary.

Existing Watersheds and Design Point Information

For the purposes of this analysis, the pre- and post-development drainage conditions were analyzed at one (1) “design point” as described below where stormwater runoff currently drains to under existing conditions. The existing site was subdivided into one (1) separate sub catchment, as described below, to analyze existing and proposed flow rates at each design point. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Design Point #1 (DP-1) is the Blue Hill Avenue municipal drainage system. Under existing conditions, this design point receives stormwater flows from approximately 6.87 acres of land, designated as watershed “E-1”. Refer to Table 2.1 below for additional detail.

Table 2.2: Existing Sub-Catchment Summary

Sub-catchment Name	Total Area (acres)	Cover Description	Curve Number (CN)	Time of Concentration (Tc, minutes)
E-1	6.87±	Rooftops, paved parking, grass, woods, 2-acre lot coverage	54	10.0

Refer to **Table 1.1 and 6.1** for the existing conditions peak rates of runoff. Refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the existing drainage areas.

III. PROPOSED SITE CONDITIONS

Proposed Development Description

The proposed project consists of the construction of a new 16,200± sf freestanding "The Gardner School" early education childcare facility including paved parking areas, landscaping, associated utilities, and a new stormwater management system. The site, including the proposed parking areas, has been designed to drain to deep-sump, hooded catch basins. The catch basins will capture and convey stormwater runoff, via an underground pipe system, to a proposed infiltration basin. Pretreatment of stormwater runoff will be provided by a combination of the deep-sump, hooded catch basins and a sediment forebay prior to discharge into the proposed infiltration basin. Rooftop runoff has been designed to flow to the basin as well.

Proposed Development Collection and Conveyance

Deep-sump, hooded catch basins are proposed to collect and route runoff from the paved parking areas to the proposed surface basin. Pipes have been designed for the 25-year storm using the Rational Method. Pipe sizing calculations are included in **Appendix F**.

The best management practices (BMPs) incorporated into the proposed stormwater management system have been designed to meets, or exceeds, the standards set forth in the Massachusetts Department of Environmental Protection Stormwater Handbook standards. Refer to **Section V** for additional information.

Proposed Watersheds and Design Point Information

The project has been designed to maintain existing drainage watersheds to the greatest extent possible, with the same design points described in **Section II** above. The site was subdivided into two (2) separate sub catchments for the proposed conditions as described below. The minimum time of concentration for all proposed areas is calculated as 6 minutes (0.1 hr).

Under proposed conditions DP-1 receives stormwater flows from approximately 6.87 acres of land, designated as watersheds "P-1" and "P-2". Refer to Table 3.1 below for additional detail.

Table 3.1: Proposed Sub-catchment Summary

Sub-catchment Name	Total Area (acres)	Cover Description	Curve Number (CN)	Time of Concentration (Tc, minutes)	Hydrologic Routing
P-1	2.00±	Rooftops, paved parking, grass	79	6.0	B-1 / DP-1

Sub-catchment Name	Total Area (acres)	Cover Description	Curve Number (CN)	Time of Concentration (Tc, minutes)	Hydrologic Routing
P-2	4.87±	Rooftops, paved parking, grass, woods, 2-acre lot coverage	63	10.0	DP-1

Refer to **Table 1.1 and 6.1** for the calculated proposed conditions peak rates of runoff. For additional hydrologic information, refer to **Appendix D** and the Drainage Area Maps in the appendices of this report for a graphical representation of the proposed drainage areas.

IV. METHODOLOGY

Peak Flow Calculations

Methodology utilized to design the proposed stormwater management system includes compliance with the guidelines set forth in the latest edition of the Massachusetts DEP Stormwater Handbook. The pre- and post-development runoff rates being discharged from the site were computed using the HydroCAD computer program. The drainage area and outlet information were entered into the program, which routes storm flows based on NRCS TR-20 and TR-55 methods. The other components of the model were determined following standard NRCS procedures for Curve Numbers (CNs) and times of concentrations documented in the appendices of this report. The rainfall data utilized and listed below in table 4.1 below for stormwater calculations is based on NOAA. Refer to **Appendix F** for more information.

Table 4.1: NOAA Rainfall Intensities

Frequency	2 year	10 year	25 year	100 year
Rainfall* (inches)	3.42	5.34	6.53	8.38

*Values derived from NOAA ATLAS on 08/16/2024

The proposed stormwater management as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year design storm events. Additionally, the proposed project meets, or exceeds, the MADEP Stormwater Management standards. Compliance with these standards is described further below.

V. STORMWATER MANAGEMENT STANDARDS

Standard #1: No New Untreated Discharges

The project has been designed so that proposed impervious areas (including the building roof and paved parking/driveway areas) shall be collected and passed through the proposed drainage system for treatment prior to discharge.

Standard #2: Peak Rate Attenuation

As outlined in **Table 1.1** and **Table 6.1**, the development of the site and the proposed stormwater management system, have been designed so that post-development peak rates of runoff are below pre-development conditions for the 2-, 10-, 25- and 100-year storm events at the design point of analysis.

Standard #3: Recharge

The stormwater runoff from the project will be collected and diverted to a proposed infiltration basin. The project as proposed will involve the creation of 58,081 square feet of new impervious area and is required to infiltrate 3,102 cubic feet of stormwater as defined in Stormwater Standard 3. The proposed infiltration basin will provide 23,566 cubic feet of volume below the lowest outlet for groundwater recharge. Refer to **Appendix F** of this report for calculations documenting required and provided recharge volumes.

The DEP Stormwater Standards require that the infiltration BMP drains completely within 72 hours of the end of the storm event. Calculations showing that the proposed infiltration basin will drain within 33.7 hours are included in **Appendix F** of this report.

A four (4) foot separation to estimated seasonal high groundwater is provided and a groundwater mounding analysis is not required.

Standard #4: Water Quality

Water quality treatment is provided via deep-sump, hooded catch basins, a sediment forebay, and an infiltration basin. TSS removal calculations are included in **Appendix F** of this report. The project as proposed will involve the creation of 58,081 square feet of new impervious area and is required to treat 5,363 cubic feet of water quality volume as defined in Stormwater Standard 4. The proposed infiltration basin provides 23,566 cubic feet of water quality volume below the

lowest outlet for water quality treatment. Refer to **Appendix F** of this report for calculations documenting required and provided water quality volumes.

Standard #5: Land Use with Higher Potential Pollutant Loads

Not Applicable for this project.

Standard #6: Critical Areas

Not Applicable for this project.

Standard #7: Redevelopment

Not Applicable for this project.

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

The proposed project will provide construction period erosion and sedimentation controls as indicated within the site plan set provided for this project. This includes a proposed construction exit, protection for stormwater inlets, protection around temporary material stock piles and various other techniques as outlined on the erosion and sediment control sheets. Additionally, the project is required to file a Notice of Intent with the US EPA and implement a Stormwater Pollution Prevention Plan (SWPPP) during the construction period. The SWPPP will be prepared prior to the start of construction and will be implemented by the site contractor under the guidance and responsibility of the project's proponent. Refer to **Appendix H**.

Standard #9: Operation and Maintenance Plan (O&M Plan)

An Operation and Maintenance (O&M) Plan for this site has been prepared and is included in **Appendix G** of this report. The O&M Plan outlines procedures and time tables for the long term operation and maintenance of the proposed site stormwater management system, including initial inspections upon completion of construction, and periodic monitoring of the system components, in accordance with established practices and the manufacturer's recommendations. The O&M Plan includes a list of responsible parties and an estimated budget for inspections and maintenance.

Standard #10: Prohibition of Illicit Discharges

The proposed stormwater system will only convey allowable non-stormwater discharges (firefighting waters, irrigation, air conditioning condensates, etc.) and will not contain any illicit

discharges from prohibited sources. An Illicit Discharge Statement is included in **Appendix G** of this report.

VI. SUMMARY

In summary, the proposed stormwater management system illustrated on the drawings prepared by Bohler results in a reduction in peak rates of runoff from the subject site when compared to pre-development conditions for the 2-, 10-, 25- and 100-year storm frequencies. In addition, the proposed best management practices will result in an effective removal of total suspended solids from the post-development runoff. The pre-development versus post-development stormwater discharge comparisons are contained in **Table 6.1** below:

Table 6.1: Design Point Peak Runoff Rate Summary

Point of Analysis	2-Year Storm			10-Year Storm			25-Year Storm			100-Year Storm		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP-1	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.00	0.00	**0.00**	2.53	2.51	**-0.02**

**Flows are represented in cubic feet per second (cfs)*

As outlined in the table above, the proposed stormwater management system as designed will provide a decrease in peak rates of runoff from the proposed facility for the 2-, 10-, 25- and 100-year storm events. Additionally, the project meets or exceeds the MADEP Stormwater Management Standards as described further herein.

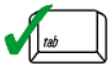
APPENDIX A: MASSACHUSETTS STORMWATER MANAGEMENT CHECKLIST

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

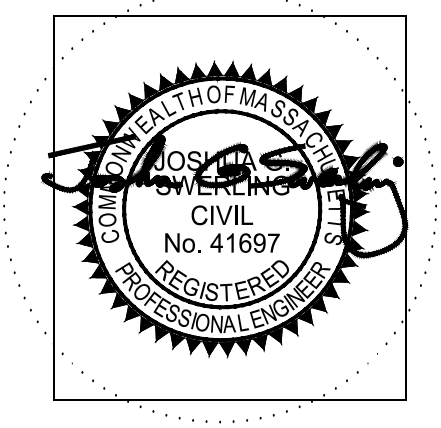
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature



Signature and Date — August 28, 2024

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): Infiltration Basin

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

☐ 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

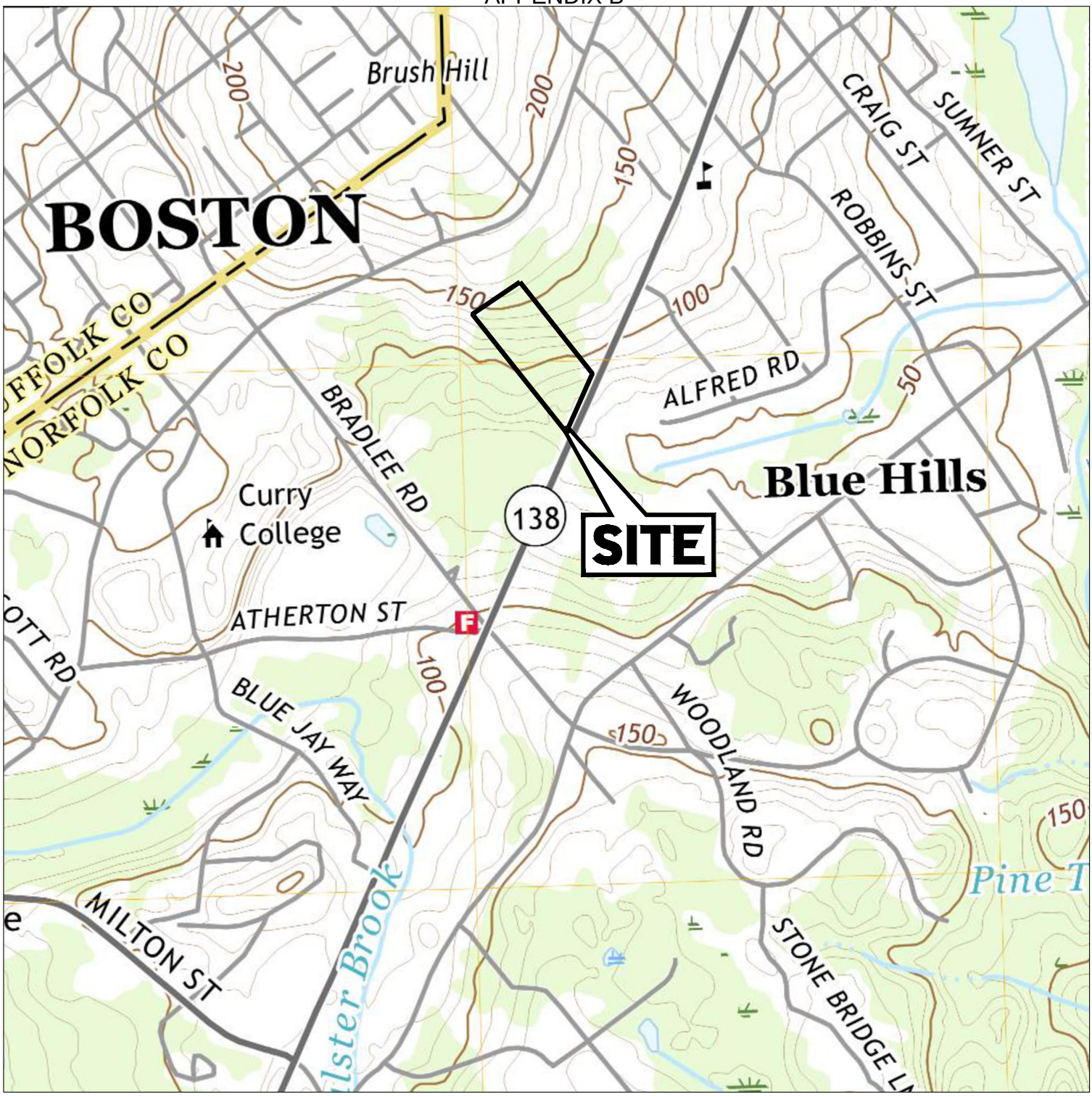
☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☒ 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.

APPENDIX B: PROJECT LOCATION MAPS

- *USGS MAP*
- *FEMA FIRMETTE*



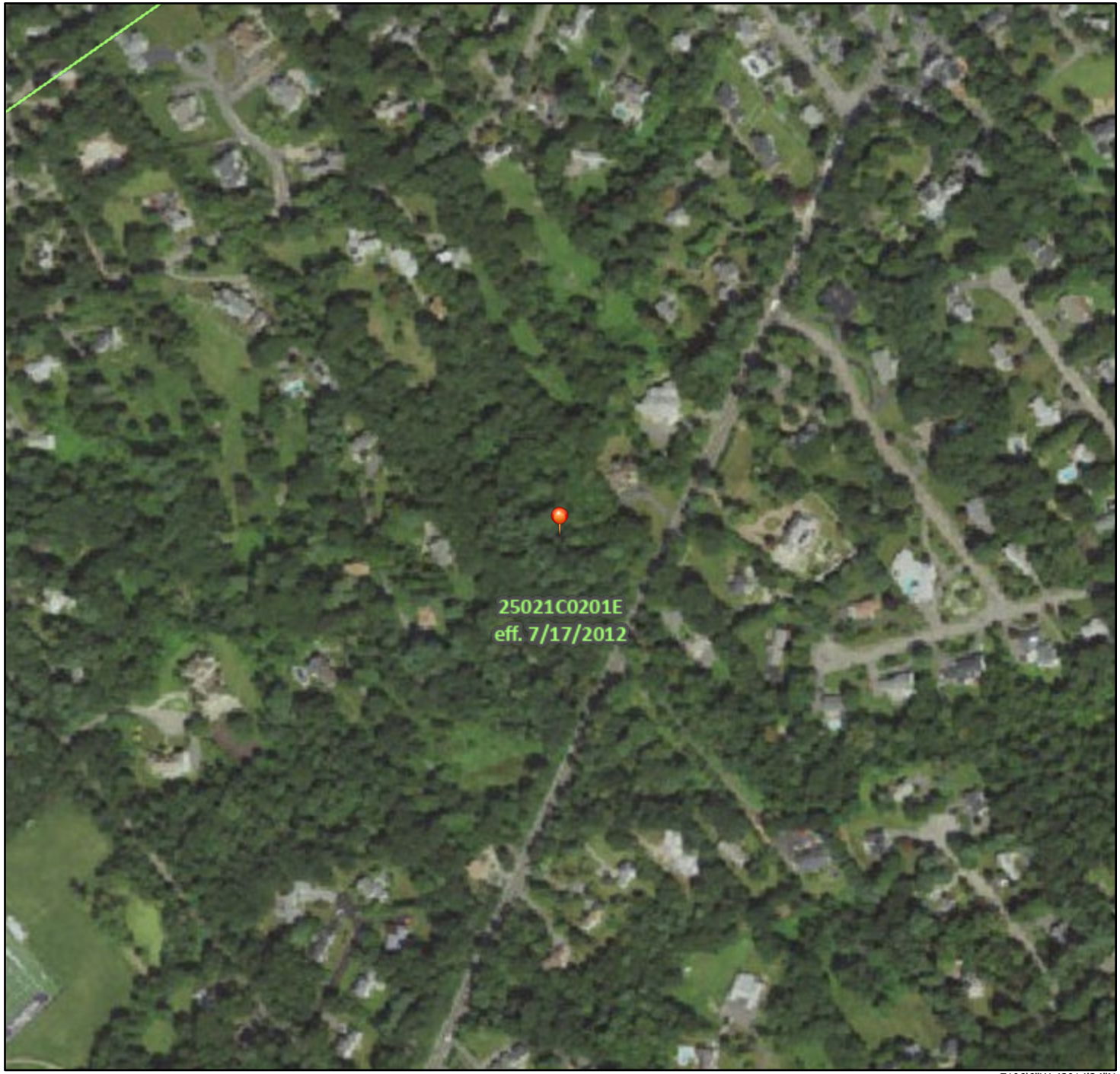
USGS MAP

SCALE: 1" = 1,000'
SOURCE: USGS BLUE HILLS, MA
QUADRANGLE, 2021

National Flood Hazard Layer FIRMette

FEMA

71°6'43"W 42°14'50"N



71°6'6"W 42°14'24"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

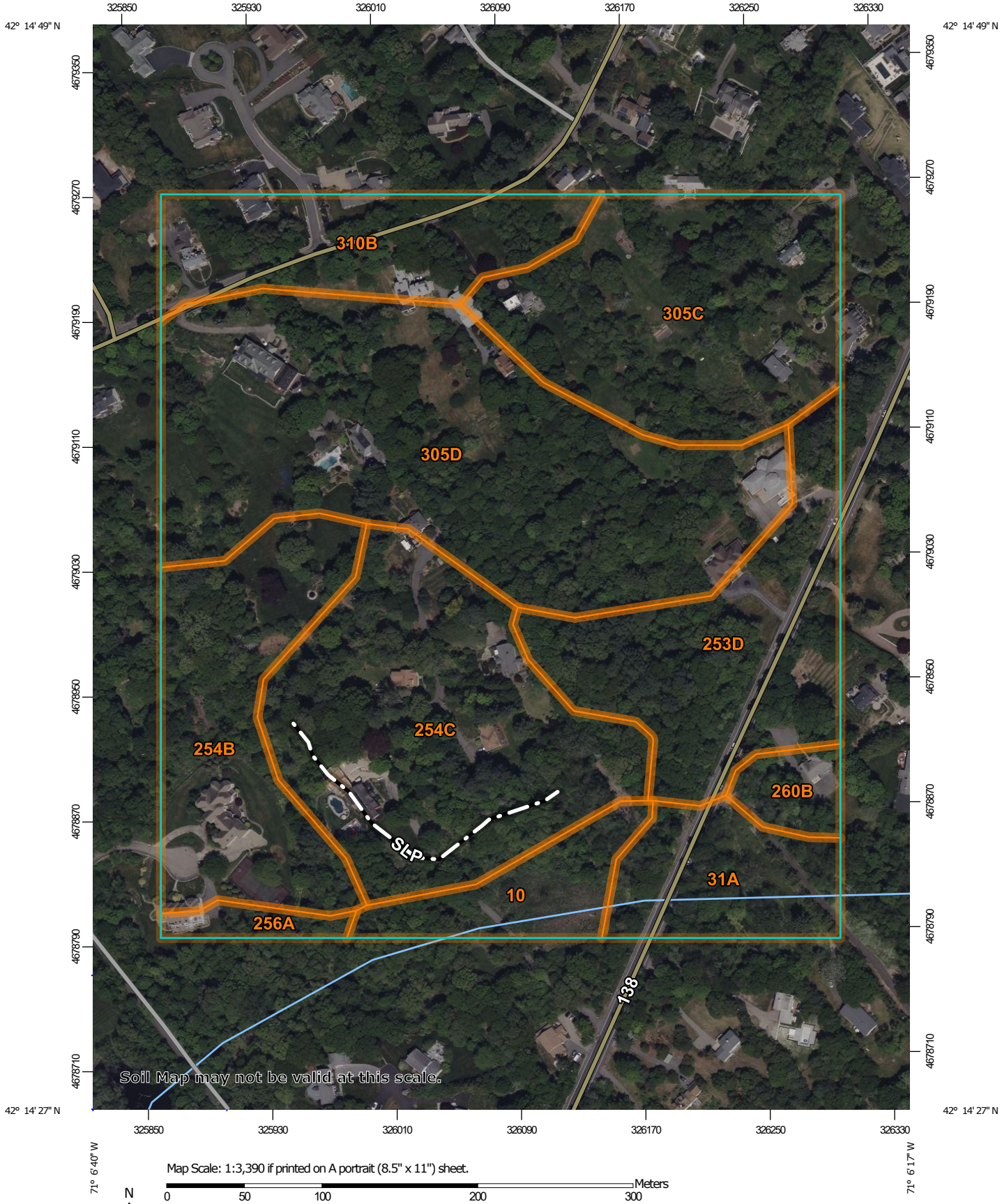
This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/21/2024 at 8:19 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX C: SOIL AND WETLAND INFORMATION

- *NCRS CUSTOM SOIL RESOURCE REPORT*
- *DRAFT REPORT OF GEOTECHNICAL INVESTIGATION*



Map Scale: 1:3,390 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 19, Sep 10, 2023

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

Date(s) aerial images were photographed: May 22, 2022—Jun 5, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
10	Scarboro and Birdsall soils, 0 to 3 percent slopes	2.0	3.8%
31A	Walpole sandy loam, 0 to 3 percent slopes	2.7	5.3%
253D	Hinckley loamy sand, 15 to 35 percent slopes	6.0	11.6%
254B	Merrimac fine sandy loam, 3 to 8 percent slopes	5.7	11.0%
254C	Merrimac fine sandy loam, 8 to 15 percent slopes	8.9	17.3%
256A	Deerfield loamy fine sand, 0 to 3 percent slopes	0.6	1.1%
260B	Sudbury fine sandy loam, 2 to 8 percent slopes	0.8	1.6%
305C	Paxton fine sandy loam, 8 to 15 percent slopes	7.3	14.1%
305D	Paxton fine sandy loam, 15 to 25 percent slopes	13.6	26.3%
310B	Woodbridge fine sandy loam, 3 to 8 percent slopes	4.1	7.9%
Totals for Area of Interest		**51.6**	**100.0%**

WHITESTONE

FIGURE 1
Boring Location Plan

N:\Job Folders\2024\2422048GM\Drawings and Plans\CAD\GM2422048.000.dwg

LEGEND

BORING LOCATION

SUBJECT PROPERTY BOUNDARY

NOTE: ALL LOCATIONS ARE APPROXIMATE.

REFERENCE

THIS PLAN IS BASED ON A 6/14/24 CONCEPT PLAN PREPARED BY BOHLER.

PROJECT #:	GM2422048.000
DESIGNED BY:	MR
DATE:	7/10/24
SCALE:	1" = 50'
PROJ. MGR.:	RR
FIGURE:	1

DRAWING TITLE:
BORING LOCATION PLAN

CLIENT:
THE GARDNER SCHOOL

PROJECT:
PROPOSED DAYCARE CENTER
BETWEEN 665 AND 711 BLUE HILL AVENUE
PARCEL ID NO.: B 7 5
MILTON, NORFOLK COUNTY, MASSACHUSETTS

WHITESTONE
An Employee-Owned Company
352 TURNPIKE ROAD, SUITE 105, SOUTHBOROUGH, MA 01772
508.485.0755 WHITESTONEASSOC.COM

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APPENDIX A
Records of Subsurface Exploration

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-1

Page 1 of 1

Project:	Proposed Daycare Center	**WAI Project No.:**	GM2422048.000
Location:	Blue Hill Avenue, Milton, Norfolk County, Massachusetts	**Client:**	The Gardner School
Surface Elevation:	± NS feet Above NAVD88	**Date Started:**	6/26/2024
Termination Depth:	18.5 feet bgs	**Date Completed:**	6/26/2024
Proposed Location:	Building	**Logged By:**	ZH
Drill / Test Method:	HSA / SPT (Autohammer)	**Contractor:**	DE
		Equipment:	Mobile B-57

Water Depth | Elevation (feet bgs) | (ft NAVD88)		Cave-In Depth | Elevation (feet bgs) | (ft NAVD88)	
During:	7.0 | --		
At Completion:	-- | --	**At Completion:**	-- | --
24 Hours:	-- | --	**24 Hours:**	-- | --

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
							TS		8" Topsoil	
0 - 2	S-1		2 - 1 - 2 - 3	11	3		EXISTING FILL		Brown, Very Loose, Silty Sand (FILL)	
2 - 4	S-2		9 - 19 - 20 - 31	2	39				Brown, Dense, Poorly Graded Gravel with Silt and Sand (FILL)	
						5.0				
5 - 7	S-3		3 - 11 - 15 - 19	13	26				Gray, Medium Dense, Silty Sand with Gravel (FILL)	
						7.0				
						7.3	TS		3" Former Topsoil	
7 - 9	S-4		18 - 21 - 22 - 21	23	43		GLACIAL TILL		Gray, Dense, Silty Sand with Gravel (SM)	
						10.0				
10 - 11.3	S-5		15 - 29 - 50/4"	14	58				As Above, Very Dense (SM)	Cobbles & Boulders
						15.0				
15 - 16.4	S-6		23 - 44 - 50/5"	16	88				As Above (SM)	Cobbles & Boulders
						20.0			Boring Log B-1 Terminated upon Auger Refusal at Depth of 18.5 fbgs.	
						25.0				

NOTES: bgs = below ground surface, msl = mean sea level, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-2

Page 1 of 1

Project:	Proposed Daycare Center	**WAI Project No.:**	GM2422048.000
Location:	Blue Hill Avenue, Milton, Norfolk County, Massachusetts	**Client:**	The Gardner School
Surface Elevation:	± NS feet Above NAVD88	**Date Started:**	6/26/2024
Termination Depth:	20.7 feet bgs	**Date Completed:**	6/26/2024
Proposed Location:	Building	**Logged By:**	ZH
Drill / Test Method:	HSA / SPT (Autohammer)	**Contractor:**	DE
		Equipment:	Mobile B-57

	Water Depth (feet bgs)	Elevation (ft NAVD88)	Cave-In Depth (feet bgs)	Elevation (ft NAVD88)
During:	--	--		
At Completion:	--	--	**At Completion:**	-- / --
24 Hours:	--	--	**24 Hours:**	-- / --

Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	Depth (feet)	STRATA	DESCRIPTION OF MATERIALS (Classification)	REMARKS
						0.0			
0 - 2	S-1	X	1 - 1 - 1 - 3	20	2		TS	11" Topsoil	
							SUBSOIL	13" Subsoil	
2 - 4	S-2	X	5 - 18 - 29 - 34	20	47			Gray, Dense, Silty Sand with Gravel (SM)	
						5.0			
5 - 7	S-3	X	19 - 23 - 24 - 20	18	47			As Above (SM)	
7 - 9	S-4	X	21 - 21 - 22 - 26	20	43			As Above (SM)	
						10.0			
10 - 12	S-5	X	10 - 19 - 20 - 42	18	39		GLACIAL TILL	As Above (SM)	
						15.0			
15 - 15.2	S-6	X	50/2"	0	-			No Recovery	Cobbles & Boulders
						20.0			
20 - 20.7	S-7	X	24 - 50/2"	6	-			Gray, Very Dense, Silty Sand with Gravel (SM)	
								Boring Log B-2 Terminated at Depth of 20.7 Feet Below Ground Surface.	
						25.0			

NOTES: bgs = below ground surface, msl = mean sea level, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

WHITESTONE

RECORD OF SUBSURFACE EXPLORATION

Boring No.: B-3

Page 1 of 1

Project:	Proposed Daycare Center	**WAI Project No.:**	GM2422048.000
Location:	Blue Hill Avenue, Milton, Norfolk County, Massachusetts	**Client:**	The Gardner School
Surface Elevation:	± NS feet Above NAVD88	**Date Started:**	6/26/2024
Termination Depth:	13.0 feet bgs	**Date Completed:**	6/26/2024
Proposed Location:	Building	**Logged By:**	ZH
Drill / Test Method:	HSA / SPT (Autohammer)	**Contractor:**	DE
		Equipment:	Mobile B-57

	Water Depth (feet bgs)	Elevation (ft NAVD88)	Cave-In Depth (feet bgs)	Elevation (ft NAVD88)
During:	--	--		
At Completion:	--	--	**At Completion:**	-- / --
24 Hours:	--	--	**24 Hours:**	-- / --

SAMPLE INFORMATION						DEPTH	STRATA		DESCRIPTION OF MATERIALS (Classification)	REMARKS
Depth (feet)	No	Type	Blows Per 6"	Rec. (in.)	N	(feet)				
						0.0				
							TS		6" Topsoil	
0 - 2	S-1		1 - 2 - 1 - 3	11	3				Brown, Very Loose, Silty Sand (FILL)	
						2.0				
2 - 4	S-2		5 - 5 - 5 - 6	0	10		EXISTING FILL		No Recovery, Loose to Medium Dense	
						5.0				
						5.5			Brown, Very Loose, Silty Sand (FILL)	
5 - 7	S-3		WOH - 16 - 15 - 15	13	31				Gray, Dense, Silty Sand with Gravel (SM)	
7 - 9	S-4		14 - 13 - 15 - 20	23	28				As Above, Medium Dense (SM)	
							GLACIAL TILL			
						10.0				
10 - 12	S-5		6 - 15 - 16 - 24	16	31				As Above, Dense (SM)	
									Boring Log B-3 Terminated upon Auger Refusal at Depth of 13 fbgs.	
						15.0				
						20.0				
						25.0				

NOTES: bgs = below ground surface, msl = mean sea level, NA = Not Applicable, NE = Not Encountered, NS = Not Surveyed, P = Perched

APPENDIX D: EXISTING CONDITIONS HYDROLOGIC ANALYSIS

- *EXISTING CONDITIONS DRAINAGE MAP*
- *EXISTING CONDITIONS HYDROCAD COMPUTATIONS*

LEGEND

- DP# — DESIGN POINT
- EX-# — EXISTING SUBCATCHMENT
- A/B/C/D — HYDROLOGIC SOIL GROUP RATING
- OVERALL ANALYSIS BOUNDARY
- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION
- CONCRETE OR PAVEMENT
- GRASS OR LANDSCAPED AREA
- WOODS / UNDEVELOPED AREA

EXISTING CONDITIONS DRAINAGE AREA MAP

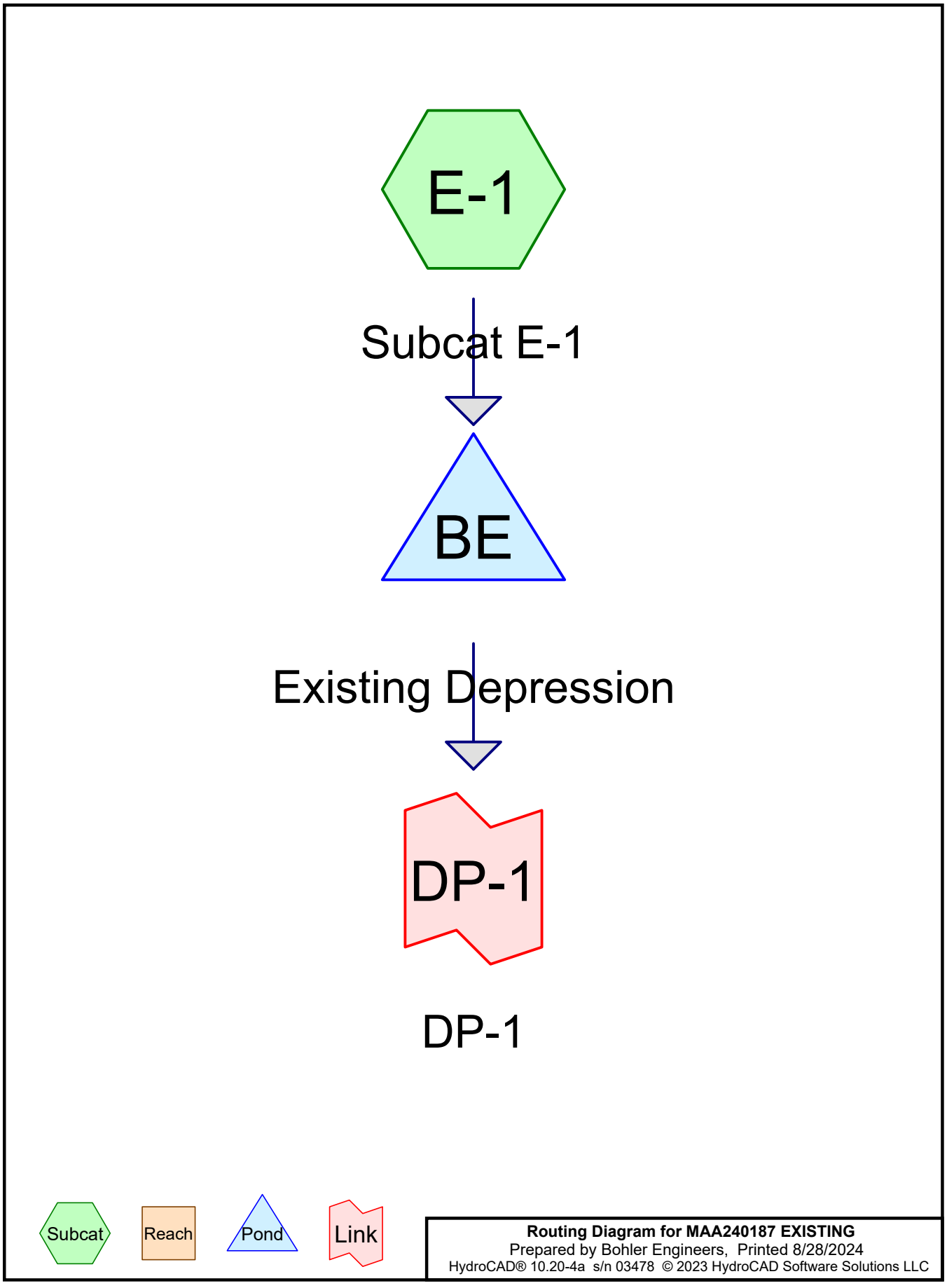
0 BLUE HILL AVENUE
MILTON, MASSACHUSETTS

PREPARED BY

BOHLER

SCALE:1"=150' DATE: 08/28/2024

P:\2024\MAA240187.00\CAD\Drawings\Plan Sets\Civil Site Plans\P-CIVL-HYDR-MAA240187.00-0a.dwg



Routing Diagram for MAA240187 EXISTING
Prepared by Bohler Engineers, Printed 8/28/2024

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 E-1: Subcat E-1 Runoff Area=6.873 ac 2.10% Impervious Runoff Depth=0.29"
Flow Length=1,400' Tc=10.0 min CN=54 Runoff=0.83 cfs 0.165 af

Pond BE: Existing Depression Peak Elev=57.28' Storage=1,346 cf Inflow=0.83 cfs 0.165 af
Discarded=0.28 cfs 0.165 af Primary=0.00 cfs 0.000 af Outflow=0.28 cfs 0.165 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 6.873 ac Runoff Volume = 0.165 af Average Runoff Depth = 0.29"
97.90% Pervious = 6.729 ac 2.10% Impervious = 0.144 ac

Summary for Subcatchment E-1: Subcat E-1

Runoff = 0.83 cfs @ 12.38 hrs, Volume= 0.165 af, Depth= 0.29"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.42"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.073	39	>75% Grass cover, Good, HSG A
0.555	74	>75% Grass cover, Good, HSG C
0.024	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
2.951	30	Woods, Good, HSG A
2.613	70	Woods, Good, HSG C
6.873	54	Weighted Average
6.729		97.90% Pervious Area
0.144		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 0.29" for 2 yr event
Inflow = 0.83 cfs @ 12.38 hrs, Volume= 0.165 af
Outflow = 0.28 cfs @ 13.76 hrs, Volume= 0.165 af, Atten= 67%, Lag= 82.7 min
Discarded = 0.28 cfs @ 13.76 hrs, Volume= 0.165 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 57.28' @ 13.76 hrs Surf.Area= 4,933 sf Storage= 1,346 cf

Plug-Flow detention time= 92.8 min calculated for 0.165 af (100% of inflow)
Center-of-Mass det. time= 93.1 min (1,046.9 - 953.7)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.28 cfs @ 13.76 hrs HW=57.28' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.28 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.80' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 E-1: Subcat E-1 Runoff Area=6.873 ac 2.10% Impervious Runoff Depth=1.09"
Flow Length=1,400' Tc=10.0 min CN=54 Runoff=6.14 cfs 0.623 af

Pond BE: Existing Depression Peak Elev=58.06' Storage=9,591 cf Inflow=6.14 cfs 0.623 af
Discarded=0.86 cfs 0.623 af Primary=0.00 cfs 0.000 af Outflow=0.86 cfs 0.623 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 6.873 ac Runoff Volume = 0.623 af Average Runoff Depth = 1.09"
97.90% Pervious = 6.729 ac 2.10% Impervious = 0.144 ac

Summary for Subcatchment E-1: Subcat E-1

Runoff = 6.14 cfs @ 12.17 hrs, Volume= 0.623 af, Depth= 1.09"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.34"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.073	39	>75% Grass cover, Good, HSG A
0.555	74	>75% Grass cover, Good, HSG C
0.024	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
2.951	30	Woods, Good, HSG A
2.613	70	Woods, Good, HSG C
6.873	54	Weighted Average
6.729		97.90% Pervious Area
0.144		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 1.09" for 10 yr event
Inflow = 6.14 cfs @ 12.17 hrs, Volume= 0.623 af
Outflow = 0.86 cfs @ 12.76 hrs, Volume= 0.623 af, Atten= 86%, Lag= 35.2 min
Discarded = 0.86 cfs @ 12.76 hrs, Volume= 0.623 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 58.06' @ 13.97 hrs Surf.Area= 14,527 sf Storage= 9,591 cf

Plug-Flow detention time= 145.4 min calculated for 0.623 af (100% of inflow)
Center-of-Mass det. time= 145.2 min (1,039.2 - 894.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.86 cfs @ 12.76 hrs HW=58.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.86 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.80' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 0.00" for 10 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 E-1: Subcat E-1 Runoff Area=6.873 ac 2.10% Impervious Runoff Depth=1.75"
Flow Length=1,400' Tc=10.0 min CN=54 Runoff=10.94 cfs 1.000 af

Pond BE: Existing Depression Peak Elev=63.10' Storage=31,734 cf Inflow=10.94 cfs 1.000 af
Discarded=0.83 cfs 0.497 af Primary=0.00 cfs 0.000 af Outflow=0.83 cfs 0.497 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 6.873 ac Runoff Volume = 1.000 af Average Runoff Depth = 1.75"
97.90% Pervious = 6.729 ac 2.10% Impervious = 0.144 ac

Summary for Subcatchment E-1: Subcat E-1

Runoff = 10.94 cfs @ 12.16 hrs, Volume= 1.000 af, Depth= 1.75"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=6.53"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.073	39	>75% Grass cover, Good, HSG A
0.555	74	>75% Grass cover, Good, HSG C
0.024	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
2.951	30	Woods, Good, HSG A
2.613	70	Woods, Good, HSG C
6.873	54	Weighted Average
6.729		97.90% Pervious Area
0.144		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 1.75" for 25 yr event
Inflow = 10.94 cfs @ 12.16 hrs, Volume= 1.000 af
Outflow = 0.83 cfs @ 12.24 hrs, Volume= 0.497 af, Atten= 92%, Lag= 4.8 min
Discarded = 0.83 cfs @ 12.24 hrs, Volume= 0.497 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 63.10' @ 22.44 hrs Surf.Area= 4,958 sf Storage= 31,734 cf

Plug-Flow detention time= 651.0 min calculated for 0.497 af (50% of inflow)
Center-of-Mass det. time= 513.7 min (1,391.2 - 877.5)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.85 cfs @ 12.24 hrs HW=58.01' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.85 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.80' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 0.00" for 25 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 E-1: Subcat E-1 Runoff Area=6.873 ac 2.10% Impervious Runoff Depth=2.93"
Flow Length=1,400' Tc=10.0 min CN=54 Runoff=19.59 cfs 1.680 af

Pond BE: Existing Depression Peak Elev=63.71' Storage=34,928 cf Inflow=19.59 cfs 1.680 af
Discarded=0.86 cfs 0.699 af Primary=2.53 cfs 0.445 af Outflow=2.83 cfs 1.143 af

Link DP-1: DP-1 Inflow=2.53 cfs 0.445 af
Primary=2.53 cfs 0.445 af

Total Runoff Area = 6.873 ac Runoff Volume = 1.680 af Average Runoff Depth = 2.93"
97.90% Pervious = 6.729 ac 2.10% Impervious = 0.144 ac

Summary for Subcatchment E-1: Subcat E-1

Runoff = 19.59 cfs @ 12.15 hrs, Volume= 1.680 af, Depth= 2.93"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=8.38"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.073	39	>75% Grass cover, Good, HSG A
0.555	74	>75% Grass cover, Good, HSG C
0.024	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
2.951	30	Woods, Good, HSG A
2.613	70	Woods, Good, HSG C
6.873	54	Weighted Average
6.729		97.90% Pervious Area
0.144		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 2.93" for 100 yr event
Inflow = 19.59 cfs @ 12.15 hrs, Volume= 1.680 af
Outflow = 2.83 cfs @ 13.02 hrs, Volume= 1.143 af, Atten= 86%, Lag= 52.3 min
Discarded = 0.86 cfs @ 17.00 hrs, Volume= 0.699 af
Primary = 2.53 cfs @ 13.02 hrs, Volume= 0.445 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 63.71' @ 13.02 hrs Surf.Area= 5,502 sf Storage= 34,928 cf

Plug-Flow detention time= 391.7 min calculated for 1.143 af (68% of inflow)
Center-of-Mass det. time= 285.0 min (1,146.0 - 861.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.30 cfs @ 17.00 hrs HW=63.58' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=2.47 cfs @ 13.02 hrs HW=63.71' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.47 cfs @ 1.15 fps)

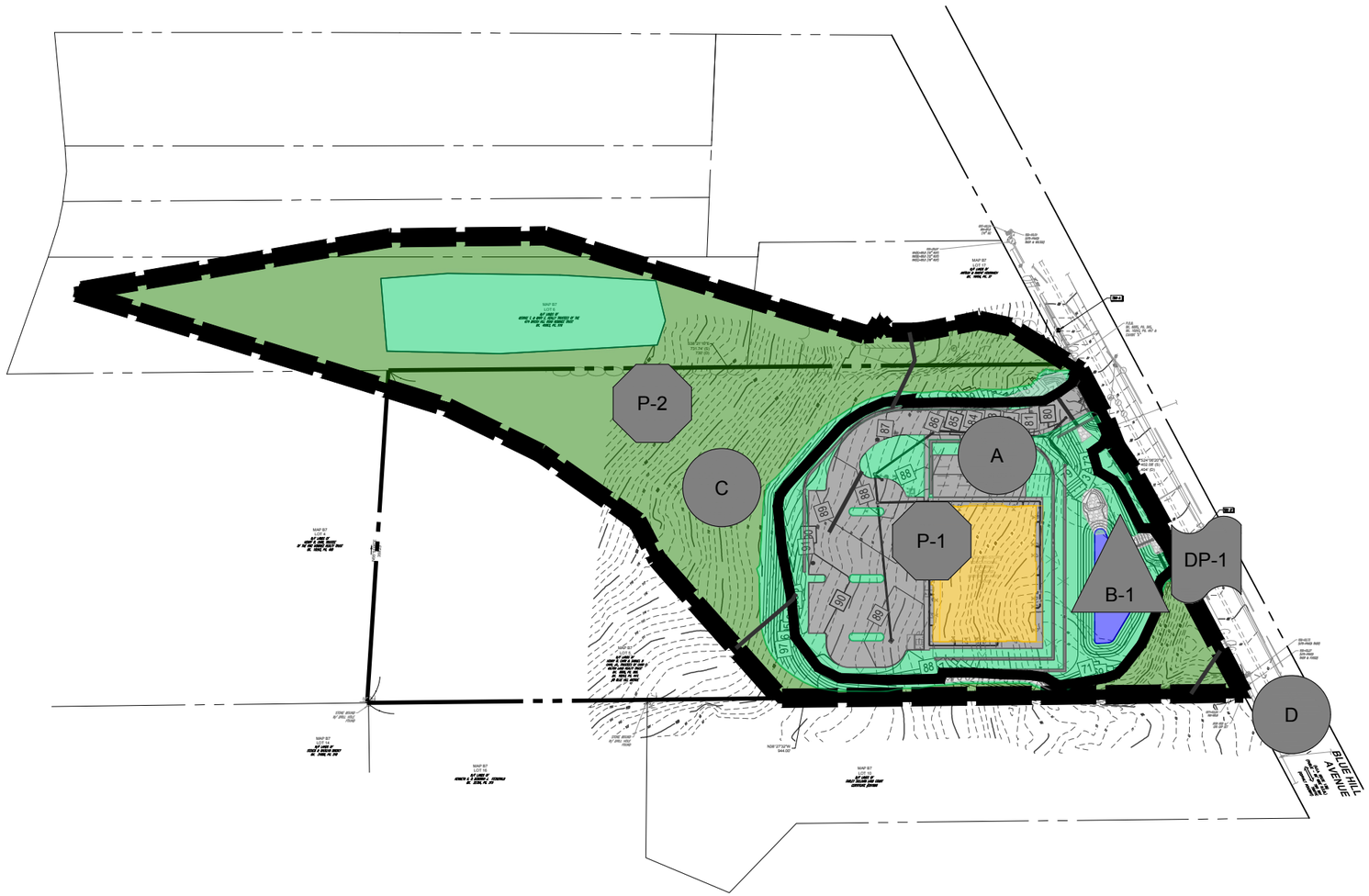
Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 2.10% Impervious, Inflow Depth = 0.78" for 100 yr event
Inflow = 2.53 cfs @ 13.02 hrs, Volume= 0.445 af
Primary = 2.53 cfs @ 13.02 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

APPENDIX E: PROPOSED CONDITIONS HYDROLOGIC ANALYSIS

- *PROPOSED CONDITIONS DRAINAGE MAP*
- *PROPOSED CONDITIONS HYDROCAD CALCULATIONS*



LEGEND

- DP# — DESIGN POINT
- EX-# — PROPOSED SUBCATCHMENT
- XX# — BASIN OR MODELED DRAINAGE STRUCTURE
- A/B/C/D — HYDROLOGIC SOIL GROUP RATING
- OVERALL ANALYSIS BOUNDARY
- SUBCATCHMENT BOUNDARY
- TIME OF CONCENTRATION
- CONCRETE OR PAVEMENT
- ROOF
- GRASS OR LANDSCAPED AREA
- WOODS / UNDEVELOPED AREA
- GRAVEL AREA

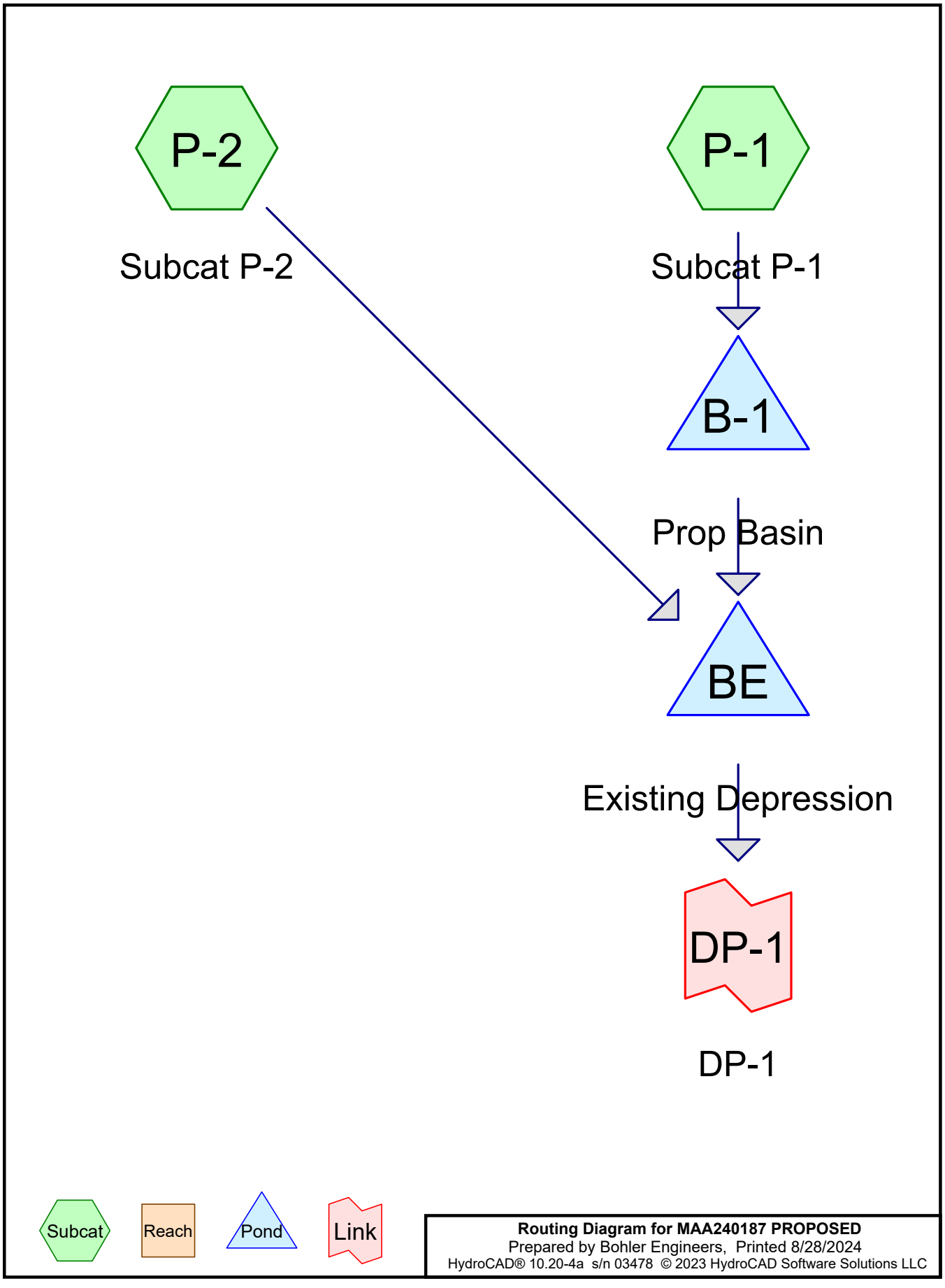
PROPOSED CONDITIONS DRAINAGE AREA MAP

0 BLUE HILL AVENUE
MILTON, MASSACHUSETTS

PREPARED BY

BOHLER

SCALE:1"=150' DATE: 08/28/2024



Routing Diagram for MAA240187 PROPOSED
Prepared by Bohler Engineers, Printed 8/28/2024

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 P-1: Subcat P-1 Runoff Area=2.007 ac 65.27% Impervious Runoff Depth=1.50"
Tc=6.0 min CN=79 Runoff=3.44 cfs 0.252 af

Subcatchment P-2: Subcat P-2 Runoff Area=4.866 ac 3.44% Impervious Runoff Depth=0.62"
Flow Length=1,400' Tc=10.0 min CN=63 Runoff=2.33 cfs 0.252 af

Pond B-1: Prop Basin Peak Elev=67.22' Storage=4,916 cf Inflow=3.44 cfs 0.252 af
Discarded=0.25 cfs 0.252 af Primary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.252 af

Pond BE: Existing Depression Peak Elev=57.54' Storage=3,103 cf Inflow=2.33 cfs 0.252 af
Discarded=0.48 cfs 0.252 af Primary=0.00 cfs 0.000 af Outflow=0.48 cfs 0.252 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 6.873 ac Runoff Volume = 0.503 af Average Runoff Depth = 0.88"
78.50% Pervious = 5.395 ac 21.50% Impervious = 1.477 ac

Summary for Subcatchment P-1: Subcat P-1

Runoff = 3.44 cfs @ 12.10 hrs, Volume= 0.252 af, Depth= 1.50"
Routed to Pond B-1 : Prop Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.42"

Area (ac)	CN	Description
0.587	39	>75% Grass cover, Good, HSG A
0.110	74	>75% Grass cover, Good, HSG C
0.818	98	Paved parking, HSG A
0.120	98	Paved parking, HSG C
0.372	98	Roofs, HSG A
2.007	79	Weighted Average
0.697		34.73% Pervious Area
1.310		65.27% Impervious Area

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

Summary for Subcatchment P-2: Subcat P-2

Runoff = 2.33 cfs @ 12.17 hrs, Volume= 0.252 af, Depth= 0.62"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 yr Rainfall=3.42"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.328	39	>75% Grass cover, Good, HSG A
0.591	74	>75% Grass cover, Good, HSG C
0.047	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
0.855	30	Woods, Good, HSG A
2.386	70	Woods, Good, HSG C
4.866	63	Weighted Average
4.698		96.56% Pervious Area
0.167		3.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond B-1: Prop Basin

Inflow Area = 2.007 ac, 65.27% Impervious, Inflow Depth = 1.50" for 2 yr event
Inflow = 3.44 cfs @ 12.10 hrs, Volume= 0.252 af
Outflow = 0.25 cfs @ 13.95 hrs, Volume= 0.252 af, Atten= 93%, Lag= 111.4 min
Discarded = 0.25 cfs @ 13.95 hrs, Volume= 0.252 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond BE : Existing Depression

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 67.22' @ 13.95 hrs Surf.Area= 4,566 sf Storage= 4,916 cf

Plug-Flow detention time= 205.7 min calculated for 0.252 af (100% of inflow)
Center-of-Mass det. time= 205.5 min (1,048.0 - 842.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	30,245 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,486	0	0
67.00	4,359	3,923	3,923
68.00	5,288	4,824	8,746
69.00	6,274	5,781	14,527
70.00	7,906	7,090	21,617
71.00	9,349	8,628	30,245

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	66.00'	**15.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.00' / 65.75' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 2	70.30'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.25 cfs @ 13.95 hrs HW=67.22' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.25 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 0.44" for 2 yr event
Inflow = 2.33 cfs @ 12.17 hrs, Volume= 0.252 af
Outflow = 0.48 cfs @ 13.02 hrs, Volume= 0.252 af, Atten= 79%, Lag= 51.1 min
Discarded = 0.48 cfs @ 13.02 hrs, Volume= 0.252 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 57.54' @ 13.02 hrs Surf.Area= 8,676 sf Storage= 3,103 cf

Plug-Flow detention time= 98.2 min calculated for 0.252 af (100% of inflow)
Center-of-Mass det. time= 98.0 min (999.1 - 901.1)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.48 cfs @ 13.02 hrs HW=57.54' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.48 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.80' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 0.00" for 2 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 P-1: Subcat P-1 Runoff Area=2.007 ac 65.27% Impervious Runoff Depth=3.10"
Tc=6.0 min CN=79 Runoff=7.14 cfs 0.518 af

Subcatchment P-2: Subcat P-2 Runoff Area=4.866 ac 3.44% Impervious Runoff Depth=1.73"
Flow Length=1,400' Tc=10.0 min CN=63 Runoff=8.05 cfs 0.701 af

Pond B-1: Prop Basin Peak Elev=68.65' Storage=12,415 cf Inflow=7.14 cfs 0.518 af
Discarded=0.33 cfs 0.518 af Primary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.518 af

Pond BE: Existing Depression Peak Elev=58.58' Storage=15,319 cf Inflow=8.05 cfs 0.701 af
Discarded=0.86 cfs 0.701 af Primary=0.00 cfs 0.000 af Outflow=0.86 cfs 0.701 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 6.873 ac Runoff Volume = 1.219 af Average Runoff Depth = 2.13"
78.50% Pervious = 5.395 ac 21.50% Impervious = 1.477 ac

Summary for Subcatchment P-1: Subcat P-1

Runoff = 7.14 cfs @ 12.09 hrs, Volume= 0.518 af, Depth= 3.10"
Routed to Pond B-1 : Prop Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.34"

Area (ac)	CN	Description
0.587	39	>75% Grass cover, Good, HSG A
0.110	74	>75% Grass cover, Good, HSG C
0.818	98	Paved parking, HSG A
0.120	98	Paved parking, HSG C
0.372	98	Roofs, HSG A
2.007	79	Weighted Average
0.697		34.73% Pervious Area
1.310		65.27% Impervious Area

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

Summary for Subcatchment P-2: Subcat P-2

Runoff = 8.05 cfs @ 12.15 hrs, Volume= 0.701 af, Depth= 1.73"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 yr Rainfall=5.34"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.328	39	>75% Grass cover, Good, HSG A
0.591	74	>75% Grass cover, Good, HSG C
0.047	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
0.855	30	Woods, Good, HSG A
2.386	70	Woods, Good, HSG C
4.866	63	Weighted Average
4.698		96.56% Pervious Area
0.167		3.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond B-1: Prop Basin

Inflow Area = 2.007 ac, 65.27% Impervious, Inflow Depth = 3.10" for 10 yr event
Inflow = 7.14 cfs @ 12.09 hrs, Volume= 0.518 af
Outflow = 0.33 cfs @ 15.19 hrs, Volume= 0.518 af, Atten= 95%, Lag= 186.1 min
Discarded = 0.33 cfs @ 15.19 hrs, Volume= 0.518 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond BE : Existing Depression

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 68.65' @ 15.19 hrs Surf.Area= 5,933 sf Storage= 12,415 cf

Plug-Flow detention time= 416.8 min calculated for 0.518 af (100% of inflow)
Center-of-Mass det. time= 416.7 min (1,238.3 - 821.6)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	30,245 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,486	0	0
67.00	4,359	3,923	3,923
68.00	5,288	4,824	8,746
69.00	6,274	5,781	14,527
70.00	7,906	7,090	21,617
71.00	9,349	8,628	30,245

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	66.00'	**15.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.00' / 65.75' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 2	70.30'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.33 cfs @ 15.19 hrs HW=68.65' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.33 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 1.22" for 10 yr event
Inflow = 8.05 cfs @ 12.15 hrs, Volume= 0.701 af
Outflow = 0.86 cfs @ 21.85 hrs, Volume= 0.701 af, Atten= 89%, Lag= 581.5 min
Discarded = 0.86 cfs @ 21.85 hrs, Volume= 0.701 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 58.58' @ 16.09 hrs Surf.Area= 7,700 sf Storage= 15,319 cf

Plug-Flow detention time= 297.9 min calculated for 0.700 af (100% of inflow)
Center-of-Mass det. time= 298.2 min (1,164.1 - 865.9)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.86 cfs @ 21.85 hrs HW=58.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.86 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.80' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 0.00" for 10 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 P-1: Subcat P-1 Runoff Area=2.007 ac 65.27% Impervious Runoff Depth=4.16"
Tc=6.0 min CN=79 Runoff=9.53 cfs 0.695 af

Subcatchment P-2: Subcat P-2 Runoff Area=4.866 ac 3.44% Impervious Runoff Depth=2.55"
Flow Length=1,400' Tc=10.0 min CN=63 Runoff=12.28 cfs 1.036 af

Pond B-1: Prop Basin Peak Elev=69.47' Storage=17,673 cf Inflow=9.53 cfs 0.695 af
Discarded=0.39 cfs 0.679 af Primary=0.00 cfs 0.000 af Outflow=0.39 cfs 0.679 af

Pond BE: Existing Depression Peak Elev=63.29' Storage=32,654 cf Inflow=12.28 cfs 1.036 af
Discarded=0.86 cfs 0.525 af Primary=0.00 cfs 0.000 af Outflow=0.86 cfs 0.525 af

Link DP-1: DP-1 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 6.873 ac Runoff Volume = 1.731 af Average Runoff Depth = 3.02"
78.50% Pervious = 5.395 ac 21.50% Impervious = 1.477 ac

Summary for Subcatchment P-1: Subcat P-1

Runoff = 9.53 cfs @ 12.09 hrs, Volume= 0.695 af, Depth= 4.16"
Routed to Pond B-1 : Prop Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=6.53"

Area (ac)	CN	Description
0.587	39	>75% Grass cover, Good, HSG A
0.110	74	>75% Grass cover, Good, HSG C
0.818	98	Paved parking, HSG A
0.120	98	Paved parking, HSG C
0.372	98	Roofs, HSG A
2.007	79	Weighted Average
0.697		34.73% Pervious Area
1.310		65.27% Impervious Area

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

Summary for Subcatchment P-2: Subcat P-2

Runoff = 12.28 cfs @ 12.15 hrs, Volume= 1.036 af, Depth= 2.55"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 yr Rainfall=6.53"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.328	39	>75% Grass cover, Good, HSG A
0.591	74	>75% Grass cover, Good, HSG C
0.047	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
0.855	30	Woods, Good, HSG A
2.386	70	Woods, Good, HSG C
4.866	63	Weighted Average
4.698		96.56% Pervious Area
0.167		3.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond B-1: Prop Basin

Inflow Area = 2.007 ac, 65.27% Impervious, Inflow Depth = 4.16" for 25 yr event
Inflow = 9.53 cfs @ 12.09 hrs, Volume= 0.695 af
Outflow = 0.39 cfs @ 15.43 hrs, Volume= 0.679 af, Atten= 96%, Lag= 200.1 min
Discarded = 0.39 cfs @ 15.43 hrs, Volume= 0.679 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond BE : Existing Depression

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 69.47' @ 15.43 hrs Surf.Area= 7,045 sf Storage= 17,673 cf

Plug-Flow detention time= 509.3 min calculated for 0.678 af (98% of inflow)
Center-of-Mass det. time= 495.8 min (1,309.0 - 813.2)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	30,245 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,486	0	0
67.00	4,359	3,923	3,923
68.00	5,288	4,824	8,746
69.00	6,274	5,781	14,527
70.00	7,906	7,090	21,617
71.00	9,349	8,628	30,245

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	66.00'	**15.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.00' / 65.75' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 2	70.30'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.39 cfs @ 15.43 hrs HW=69.47' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.39 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=66.00' (Free Discharge)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 1.81" for 25 yr event
Inflow = 12.28 cfs @ 12.15 hrs, Volume= 1.036 af
Outflow = 0.86 cfs @ 12.15 hrs, Volume= 0.525 af, Atten= 93%, Lag= 0.0 min
Discarded = 0.86 cfs @ 12.15 hrs, Volume= 0.525 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 63.29' @ 20.61 hrs Surf.Area= 5,120 sf Storage= 32,654 cf

Plug-Flow detention time= 641.4 min calculated for 0.524 af (51% of inflow)
Center-of-Mass det. time= 517.6 min (1,371.6 - 854.0)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.85 cfs @ 12.15 hrs HW=58.00' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.85 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=55.80' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 0.00" for 25 yr event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

Time span=0.00-36.00 hrs, dt=0.05 hrs, 721 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 P-1: Subcat P-1 Runoff Area=2.007 ac 65.27% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=79 Runoff=13.29 cfs 0.981 af

Subcatchment P-2: Subcat P-2 Runoff Area=4.866 ac 3.44% Impervious Runoff Depth=3.97"
Flow Length=1,400' Tc=10.0 min CN=63 Runoff=19.45 cfs 1.610 af

Pond B-1: Prop Basin Peak Elev=70.36' Storage=24,567 cf Inflow=13.29 cfs 0.981 af
Discarded=0.47 cfs 0.825 af Primary=0.41 cfs 0.054 af Outflow=0.88 cfs 0.879 af

Pond BE: Existing Depression Peak Elev=63.71' Storage=34,922 cf Inflow=19.45 cfs 1.663 af
Discarded=0.85 cfs 0.702 af Primary=2.51 cfs 0.425 af Outflow=2.81 cfs 1.128 af

Link DP-1: DP-1 Inflow=2.51 cfs 0.425 af
Primary=2.51 cfs 0.425 af

Total Runoff Area = 6.873 ac Runoff Volume = 2.590 af Average Runoff Depth = 4.52"
78.50% Pervious = 5.395 ac 21.50% Impervious = 1.477 ac

Summary for Subcatchment P-1: Subcat P-1

Runoff = 13.29 cfs @ 12.09 hrs, Volume= 0.981 af, Depth= 5.86"
Routed to Pond B-1 : Prop Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=8.38"

Area (ac)	CN	Description
0.587	39	>75% Grass cover, Good, HSG A
0.110	74	>75% Grass cover, Good, HSG C
0.818	98	Paved parking, HSG A
0.120	98	Paved parking, HSG C
0.372	98	Roofs, HSG A
2.007	79	Weighted Average
0.697		34.73% Pervious Area
1.310		65.27% Impervious Area

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

Summary for Subcatchment P-2: Subcat P-2

Runoff = 19.45 cfs @ 12.15 hrs, Volume= 1.610 af, Depth= 3.97"
Routed to Pond BE : Existing Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 yr Rainfall=8.38"

Area (ac)	CN	Description
0.612	77	2 acre lots, 12% imp, HSG C
0.328	39	>75% Grass cover, Good, HSG A
0.591	74	>75% Grass cover, Good, HSG C
0.047	98	Paved parking, HSG A
0.026	98	Paved parking, HSG C
0.001	98	Roofs, HSG A
0.020	98	Roofs, HSG C
0.855	30	Woods, Good, HSG A
2.386	70	Woods, Good, HSG C
4.866	63	Weighted Average
4.698		96.56% Pervious Area
0.167		3.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	100	0.0700	0.29		**Sheet Flow, Lawn** Grass: Short n= 0.150 P2= 3.42"
4.3	1,300	0.0990	5.07		**Shallow Concentrated Flow,** Unpaved Kv= 16.1 fps
10.0	1,400	Total			

Summary for Pond B-1: Prop Basin

Inflow Area = 2.007 ac, 65.27% Impervious, Inflow Depth = 5.86" for 100 yr event
Inflow = 13.29 cfs @ 12.09 hrs, Volume= 0.981 af
Outflow = 0.88 cfs @ 13.75 hrs, Volume= 0.879 af, Atten= 93%, Lag= 99.5 min
Discarded = 0.47 cfs @ 13.75 hrs, Volume= 0.825 af
Primary = 0.41 cfs @ 13.75 hrs, Volume= 0.054 af
Routed to Pond BE : Existing Depression

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 70.36' @ 13.75 hrs Surf.Area= 8,427 sf Storage= 24,567 cf

Plug-Flow detention time= 517.7 min calculated for 0.879 af (90% of inflow)
Center-of-Mass det. time= 467.8 min (1,271.3 - 803.5)

Volume	Invert	Avail.Storage	Storage Description
#1	66.00'	30,245 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.00	3,486	0	0
67.00	4,359	3,923	3,923
68.00	5,288	4,824	8,746
69.00	6,274	5,781	14,527
70.00	7,906	7,090	21,617
71.00	9,349	8,628	30,245

Device	Routing	Invert	Outlet Devices
#1	Discarded	66.00'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	66.00'	**15.0" Round Culvert** L= 44.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 66.00' / 65.75' S= 0.0057 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#3	Device 2	70.30'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.47 cfs @ 13.75 hrs HW=70.36' (Free Discharge)
└**1=Exfiltration** (Exfiltration Controls 0.47 cfs)

Primary OutFlow Max=0.40 cfs @ 13.75 hrs HW=70.36' (Free Discharge)
└**2=Culvert** (Passes 0.40 cfs of 11.42 cfs potential flow)
└**3=Orifice/Grate** (Weir Controls 0.40 cfs @ 0.81 fps)

Summary for Pond BE: Existing Depression

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 2.90" for 100 yr event
Inflow = 19.45 cfs @ 12.15 hrs, Volume= 1.663 af
Outflow = 2.81 cfs @ 12.90 hrs, Volume= 1.128 af, Atten= 86%, Lag= 45.4 min
Discarded = 0.85 cfs @ 16.30 hrs, Volume= 0.702 af
Primary = 2.51 cfs @ 12.90 hrs, Volume= 0.425 af
Routed to Link DP-1 : DP-1

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 63.71' @ 12.90 hrs Surf.Area= 5,501 sf Storage= 34,922 cf

Plug-Flow detention time= 384.1 min calculated for 1.128 af (68% of inflow)
Center-of-Mass det. time= 284.2 min (1,125.8 - 841.6)

Volume	Invert	Avail.Storage	Storage Description
#1	55.80'	36,533 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
55.80	0	0	0
56.00	164	16	16
57.00	868	516	532
58.00	15,363	8,116	8,648
59.00	2,116	8,740	17,387
60.00	2,779	2,448	19,835
61.00	3,429	3,104	22,939
62.00	4,137	3,783	26,722
63.00	4,865	4,501	31,223
64.00	5,756	5,311	36,533

Device	Routing	Invert	Outlet Devices
#1	Discarded	55.80'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	63.50'	**10.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Discarded OutFlow Max=0.30 cfs @ 16.30 hrs HW=63.57' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=2.46 cfs @ 12.90 hrs HW=63.71' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 2.46 cfs @ 1.15 fps)

Summary for Link DP-1: DP-1

Inflow Area = 6.873 ac, 21.50% Impervious, Inflow Depth = 0.74" for 100 yr event
Inflow = 2.51 cfs @ 12.90 hrs, Volume= 0.425 af
Primary = 2.51 cfs @ 12.90 hrs, Volume= 0.425 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.05 hrs

APPENDIX F: STORMWATER CALCULATIONS

- *MA STANDARD #3 – RECHARGE AND DRAWDOWN TIME*
- *MA STANDARD #4 – WATER QUALITY AND TSS REMOVAL*
- *NOAA RAINFALL DATA*
- *PIPE SIZING*

Proposed Early Education Center
0 Blue Hill Avenue
Milton, MA
Bohler Job Number: MAA240187.00
August 28, 2024

MA DEP Standard 3: Recharge Volume Calculations

Required Recharge Volume - A Soils (0.60 in.)	
Existing Site Impervious Area (ac)	0.025
Proposed Site Impervious Area (ac)	1.238
Proposed Increase in Site Impervious Area (ac)	1.213
Recharge Volume Required (cf)	**2,642**

Required Recharge Volume - C Soils (0.25 in.)	
Existing Site Impervious Area (ac)	0.119
Proposed Site Impervious Area (ac)	0.239
Proposed Increase in Site Impervious Area (ac)	0.120
Recharge Volume Required (cf)	**109**

Total Recharge Volume Required (cf)	**2,751**

Recharge Volume Adjustment Factor	
Impervious Area Directed to Infiltration BMP (ac)	**1.310**
%Impervious Directed to Infiltration BMP	89%
Adjustment Factor	1.13
Adjusted Total Recharge Volume Required (cf)	**3,102**

Provided Recharge Volume*	
Proposed Basin B-1	23,566
Total Recharge Volume Provided (cf)	**23,566**

Provided greater than or Equal to Required

*Volume provided below lowest outlet in cubic feet (cf)

Prepared By:
BOHLER
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

Proposed Early Education Center
0 Blue Hill Avenue
Milton, MA
Bohler Job Number: MAA240187.00
August 28, 2024

MA DEP Standard 3: Drawdown Time Calculations

Drawdown Time - Proposed Basin B-1	
Volume below outlet pipe (Rv) (cf)	23,566
Soil Type	Loamy Sand - A
Infiltration rate (K)*	2.41
Bottom Area (sf)	3,486
Drawdown time (Hours)*	**33.7**

*Infiltration Rates taken from Rawls Table
**Drawdown time = Rv / (K) x (bottom area)

Prepared By:
BOHLER
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

Proposed Early Education Center
0 Blue Hill Avenue
Milton, MA
Bohler Job Number: MAA240187.00
August 28, 2024

MA DEP Standard 4: Water Quality Volume Calculations

Water Quality Volume Required	
Water Quality Volume runoff (in.)*	0.5
Total Post Development Impervious Area (sf)	64,357
Required Water Quality Volume (cf)	**2,682**
*Water Quality volume runoff is equal to 0.5 inches of runoff times the total impervious area of the post development project site.	

Water Quality Volume Provided*	
Proposed Basin B-1	23,566
Total Provided Water Quality Volume (cf)	**23,566**

Required Recharge Provided

*Volume provided below lowest outlet pipe in cubic feet (cf)

Prepared By:
BOHLER
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

Proposed Early Education Center
0 Blue Hill Avenue
Milton, MA
Bohler Job Number: MAA240187.00
August 28, 2024

MA DEP Standard 4: TSS Removal Calculation Worksheet

BMP Treatment Train: Catch Basin to Infiltration Basin with Sediment Forebay

A BMP	B TSS Removal Rate	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep-Sump, Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
Infiltration Basin with Sediment Forebay	**0.80**	**0.75**	**0.60**	**0.15**
		Total TSS Removal =	**85%**	

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

Prepared By:
BOHLER
352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

NOAA Atlas 14, Volume 10, Version 3
Location name: Milton, Massachusetts, USA*
Latitude: 42.2437°, Longitude: -71.1067°
Elevation: 93 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.307 (0.251-0.373)	0.380 (0.310-0.463)	0.500 (0.407-0.612)	0.600 (0.484-0.740)	0.737 (0.572-0.967)	0.838 (0.636-1.14)	0.948 (0.696-1.35)	1.08 (0.736-1.57)	1.28 (0.832-1.95)	1.45 (0.917-2.26)
10-min	0.435 (0.355-0.529)	0.539 (0.440-0.656)	0.709 (0.576-0.867)	0.850 (0.687-1.05)	1.04 (0.811-1.37)	1.19 (0.902-1.61)	1.34 (0.986-1.91)	1.53 (1.04-2.23)	1.81 (1.18-2.76)	2.05 (1.30-3.21)
15-min	0.511 (0.418-0.622)	0.634 (0.517-0.772)	0.834 (0.678-1.02)	1.00 (0.808-1.23)	1.23 (0.954-1.61)	1.40 (1.06-1.89)	1.58 (1.16-2.25)	1.80 (1.23-2.62)	2.13 (1.39-3.25)	2.41 (1.53-3.77)
30-min	0.698 (0.571-0.849)	0.868 (0.709-1.06)	1.15 (0.932-1.40)	1.38 (1.11-1.70)	1.69 (1.32-2.22)	1.93 (1.46-2.61)	2.18 (1.60-3.11)	2.49 (1.70-3.62)	2.95 (1.92-4.50)	3.34 (2.12-5.22)
60-min	0.885 (0.724-1.08)	1.10 (0.900-1.34)	1.46 (1.19-1.78)	1.75 (1.42-2.16)	2.16 (1.68-2.84)	2.46 (1.87-3.33)	2.78 (2.04-3.97)	3.18 (2.16-4.63)	3.77 (2.45-5.74)	4.27 (2.70-6.67)
2-hr	1.12 (0.924-1.36)	1.42 (1.17-1.72)	1.90 (1.56-2.31)	2.30 (1.87-2.82)	2.86 (2.23-3.73)	3.26 (2.49-4.40)	3.71 (2.74-5.26)	4.25 (2.91-6.14)	5.08 (3.32-7.68)	5.80 (3.68-8.97)
3-hr	1.30 (1.08-1.57)	1.65 (1.36-1.99)	2.21 (1.82-2.68)	2.68 (2.19-3.27)	3.33 (2.61-4.33)	3.80 (2.91-5.10)	4.32 (3.21-6.10)	4.95 (3.40-7.13)	5.93 (3.88-8.91)	6.78 (4.31-10.4)
6-hr	1.72 (1.43-2.06)	2.15 (1.78-2.57)	2.85 (2.35-3.43)	3.43 (2.81-4.16)	4.23 (3.34-5.46)	4.82 (3.71-6.41)	5.46 (4.07-7.64)	6.25 (4.30-8.91)	7.45 (4.89-11.1)	8.48 (5.41-12.9)
12-hr	2.26 (1.89-2.69)	2.78 (2.32-3.30)	3.62 (3.01-4.29)	4.31 (3.56-5.19)	5.27 (4.19-6.73)	5.98 (4.62-7.87)	6.74 (5.01-9.33)	7.67 (5.30-10.8)	9.06 (5.97-13.4)	10.3 (6.56-15.5)
24-hr	2.78 (2.34-3.28)	3.42 (2.87-4.04)	4.47 (3.74-5.30)	5.34 (4.43-6.38)	6.53 (5.22-8.30)	7.42 (5.78-9.70)	8.38 (6.30-11.5)	9.56 (6.64-13.4)	11.4 (7.52-16.6)	13.0 (8.31-19.4)
2-day	3.17 (2.69-3.72)	3.99 (3.38-4.69)	5.33 (4.49-6.29)	6.44 (5.39-7.65)	7.98 (6.42-10.1)	9.09 (7.14-11.9)	10.3 (7.87-14.2)	11.9 (8.30-16.6)	14.5 (9.58-20.9)	16.7 (10.8-24.7)
3-day	3.48 (2.96-4.07)	4.37 (3.71-5.11)	5.82 (4.92-6.83)	7.02 (5.89-8.30)	8.68 (7.01-10.9)	9.88 (7.80-12.9)	11.2 (8.59-15.4)	13.0 (9.05-17.9)	15.8 (10.5-22.7)	18.3 (11.8-26.9)
4-day	3.78 (3.22-4.40)	4.69 (4.00-5.47)	6.19 (5.25-7.24)	7.43 (6.25-8.75)	9.13 (7.40-11.5)	10.4 (8.20-13.4)	11.8 (9.02-16.1)	13.6 (9.48-18.7)	16.5 (11.0-23.7)	19.1 (12.3-28.0)
7-day	4.61 (3.95-5.33)	5.55 (4.75-6.43)	7.09 (6.04-8.25)	8.36 (7.08-9.80)	10.1 (8.24-12.6)	11.4 (9.05-14.7)	12.8 (9.86-17.4)	14.7 (10.3-20.1)	17.7 (11.8-25.2)	20.4 (13.2-29.6)
10-day	5.37 (4.62-6.19)	6.33 (5.44-7.31)	7.90 (6.76-9.17)	9.21 (7.82-10.8)	11.0 (8.98-13.6)	12.3 (9.80-15.7)	13.8 (10.6-18.5)	15.6 (11.0-21.2)	18.6 (12.4-26.3)	21.2 (13.7-30.6)
20-day	7.56 (6.55-8.66)	8.61 (7.44-9.87)	10.3 (8.89-11.9)	11.7 (10.0-13.6)	13.7 (11.2-16.7)	15.2 (12.0-19.0)	16.7 (12.7-21.8)	18.5 (13.1-24.8)	21.1 (14.2-29.5)	23.2 (15.1-33.2)
30-day	9.35 (8.13-10.7)	10.5 (9.09-12.0)	12.3 (10.6-14.1)	13.8 (11.8-15.9)	15.9 (13.0-19.2)	17.5 (13.9-21.6)	19.1 (14.5-24.5)	20.8 (14.8-27.7)	23.1 (15.6-32.1)	24.9 (16.2-35.5)
45-day	11.6 (10.1-13.1)	12.8 (11.1-14.5)	14.7 (12.8-16.8)	16.3 (14.0-18.8)	18.5 (15.2-22.2)	20.3 (16.1-24.8)	22.0 (16.6-27.8)	23.6 (16.9-31.2)	25.6 (17.4-35.3)	27.1 (17.7-38.4)
60-day	13.4 (11.8-15.2)	14.7 (12.8-16.6)	16.7 (14.5-19.0)	18.4 (15.9-21.1)	20.7 (17.0-24.6)	22.5 (17.9-27.4)	24.3 (18.3-30.5)	25.8 (18.5-34.0)	27.8 (18.8-38.1)	29.1 (19.0-40.9)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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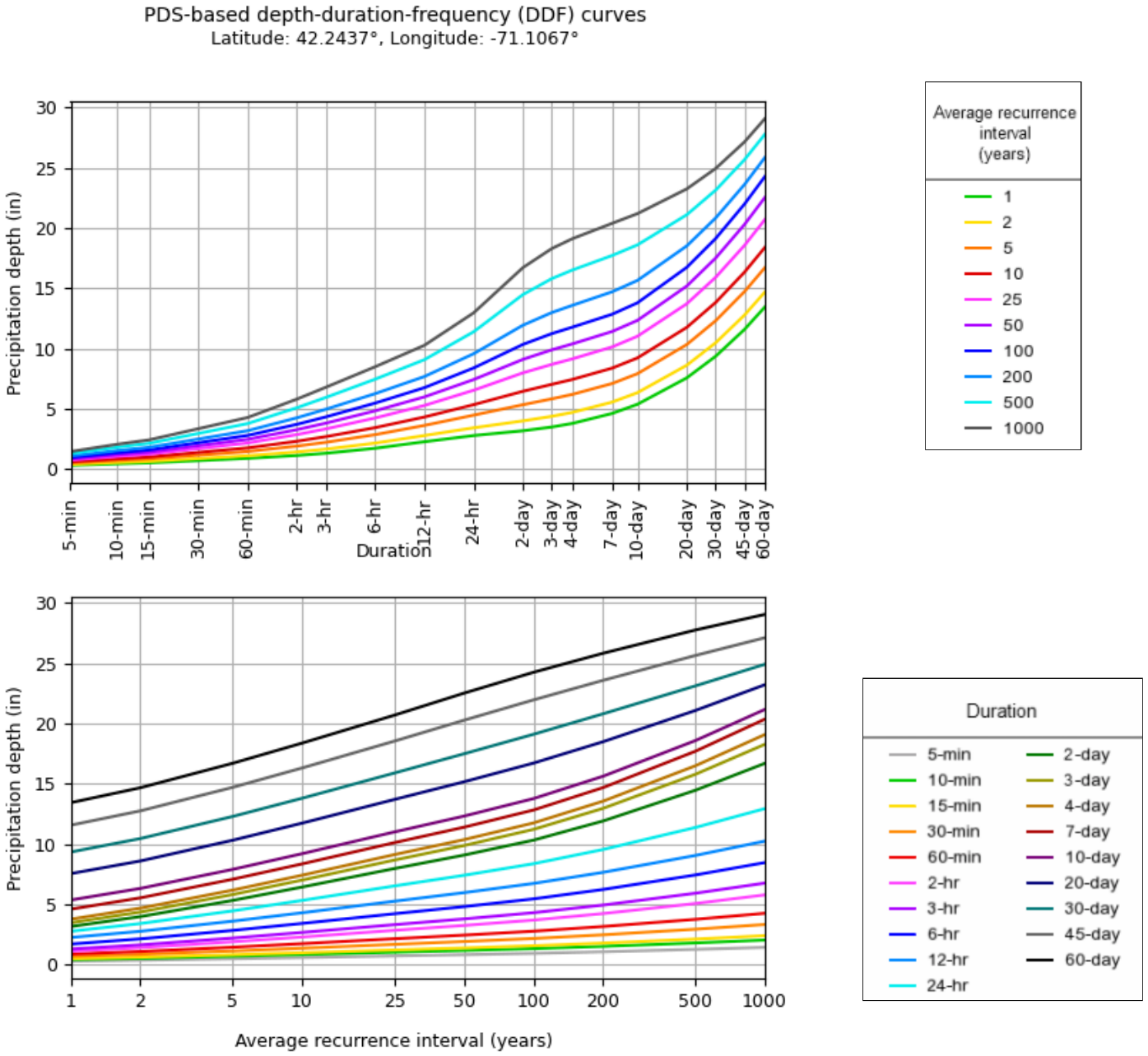
PF graphical



NOAA Atlas 14, Volume 10, Version 3 Created (GMT): Fri Aug 16 13:15:41 2024

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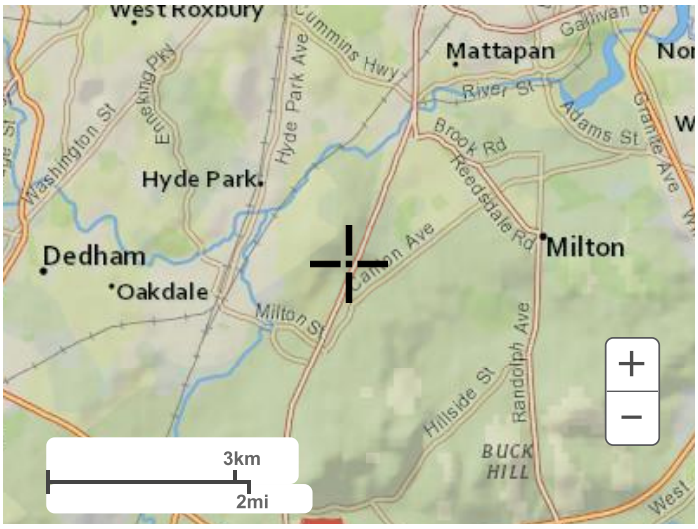
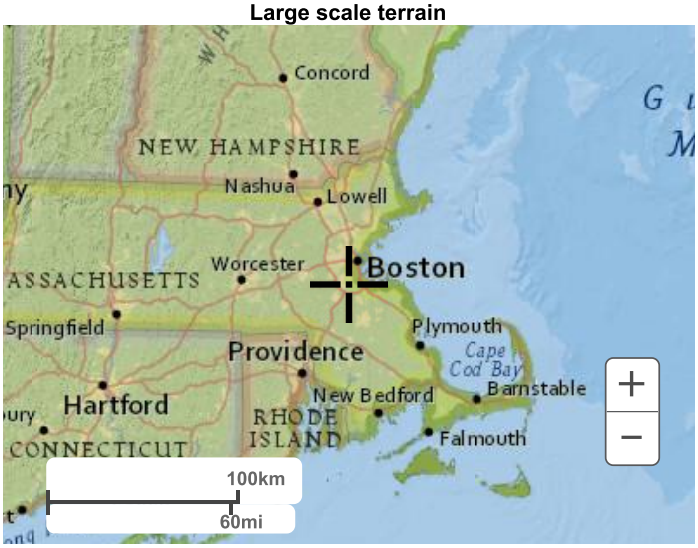
Maps & aerials

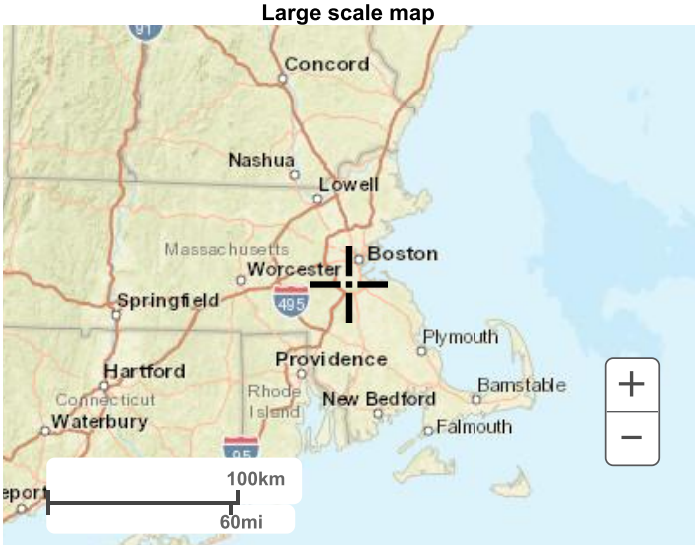
Small scale terrain



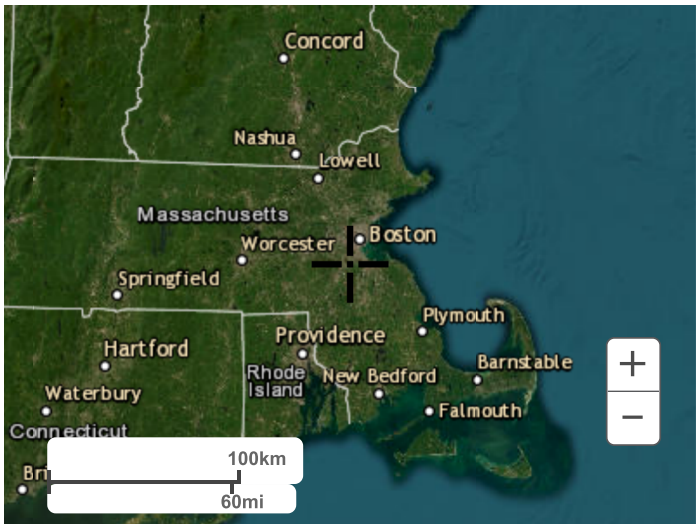
Large scale terrain



Large scale map



Large scale aerial



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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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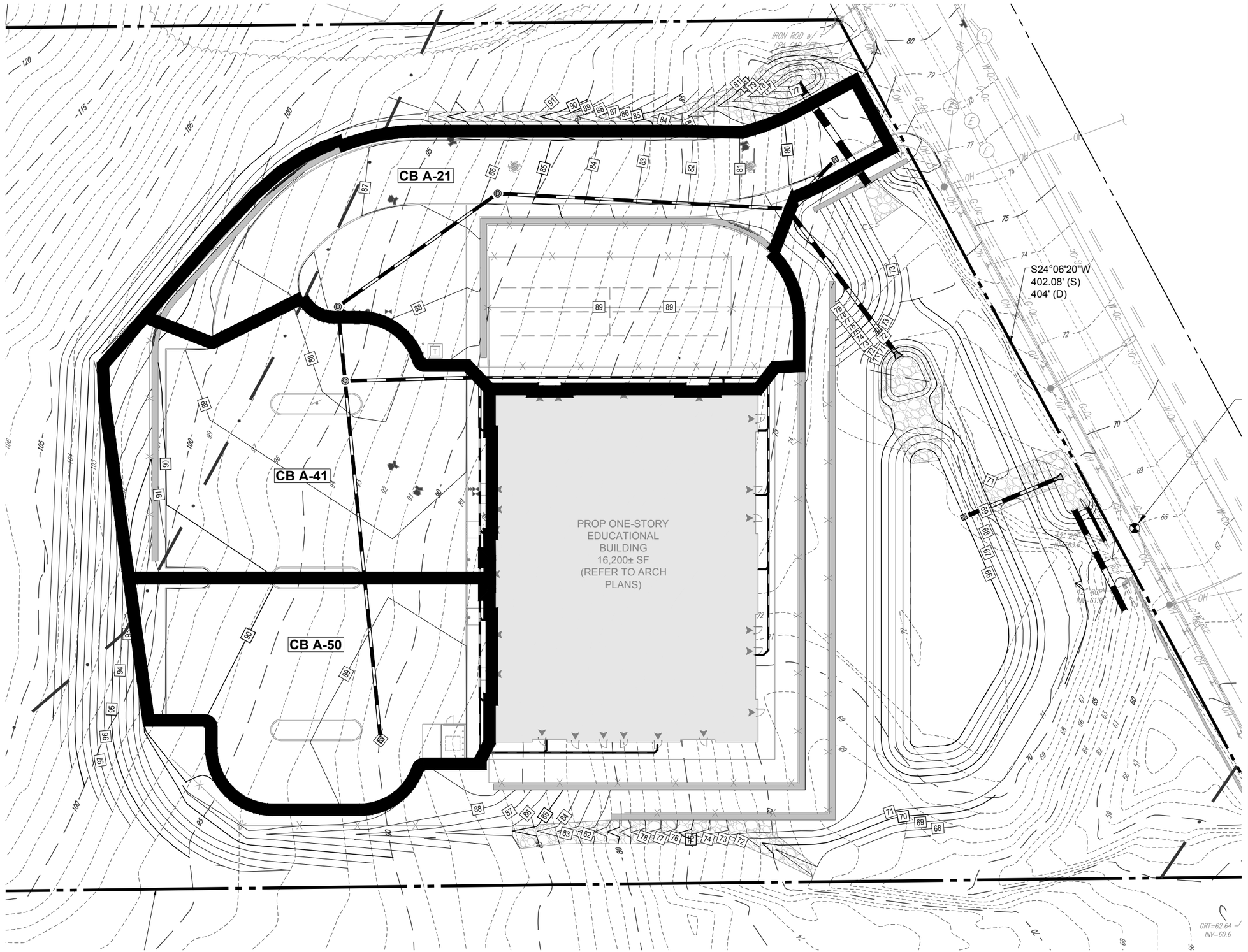

CATCH BASIN AREA BOUNDARY

PROPOSED CATCH BASIN AREA MAP

0 BLUE HILL AVENUE
MILTON, MASSACHUSETTS

PREPARED BY

BOHLER

SCALE:1"=40' DATE: 08/28/2024

P:\2024\MAA240187.00\CADD\Drawings\Plan Sets\Civil Site Plans\P-CIVL-HYDR-MAA240187.00-0a.dwg

Proposed Early Education Center
0 Blue Hill Avenue
Milton, MA
Bohler Job Number: MAA240187.00
August 28, 2024

Rational Pipe Sizing Calculations

Design Period Storm:		25	Year	Design Period Intensity*			6.53	in/hr								
LOCATION		IMPERVIOUS			OTHER			SUM	Tc	I	Q	D	S	Material	n	Q Full	V Full
FROM	TO	A	C	CA	A	C	CA	CA	(min)	(in/hr)	(cfs)	(in)	(ft/ft)			(cfs)	(fps)
A-50	A-40	0.24	0.95	0.23	0.03	0.30	0.01	0.24	6	6.53	1.58	12	0.028	HDPE	0.012	6.49	8.27
A-41	A-40	0.31	0.95	0.29	0.06	0.30	0.02	0.31	6	6.53	2.01	12	0.032	HDPE	0.012	6.88	8.76
A-40	A-30								6	6.53	3.59	12	0.028	HDPE	0.012	6.49	8.27
A-30	A-20								6	6.53	3.59	12	0.028	HDPE	0.012	6.49	8.27
A-21	A-20	0.43	0.95	0.41	0.11	0.30	0.03	0.44	6	6.53	2.88	12	0.039	HDPE	0.012	7.60	9.68
A-20	A-10								6	6.53	6.46	18	0.024	HDPE	0.012	17.67	10.00
B-40	B-30								6	6.53	0.41	15	0.006	HDPE	0.012	5.28	4.31

*Rainfall intensity provided by NOAA Atlas 14, Volume 10, Version 2 on 08/16/2024

Prepared By:
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352 Turnpike Road
Southborough, MA 01772
(508) 480-9900

Proposed Early Education Center
0 Blue Hill Avenue
Milton, MA
Bohler Job Number: MAA240187.00
August 28, 2024

Forebay Sizing Calculations

Forebay #1	
Total Post Develpoment Impervious Area (acres)	1.310
Forebay Volume Required (cf)	476
Forebay Volume Provided (cf)*	**488**

*Volume provided below lowest outlet of forebay, refer to attached storage tables

Prepared By: Bohler
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Stage-Area-Storage for Pond FB: Forebay

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
67.50	0	0
67.55	19	0
67.60	38	2
67.65	58	4
67.70	77	8
67.75	96	12
67.80	115	17
67.85	134	24
67.90	154	31
67.95	173	39
68.00	192	48
68.05	198	58
68.10	203	68
68.15	209	78
68.20	215	89
68.25	221	100
68.30	226	111
68.35	232	122
68.40	238	134
68.45	244	146
68.50	250	158
68.55	255	171
68.60	261	184
68.65	267	197
68.70	273	211
68.75	278	224
68.80	284	238
68.85	290	253
68.90	296	267
68.95	301	282
69.00	307	298
69.05	314	313
69.10	321	329
69.15	328	345
69.20	335	362
69.25	342	379
69.30	349	396
69.35	356	414
69.40	363	432
69.45	370	450
69.50	377	469
69.55	384	488
69.60	391	507
69.65	398	527
69.70	405	547
69.75	412	567
69.80	419	588
69.85	426	609
69.90	433	631
69.95	440	652
70.00	**447**	**675**

APPENDIX G: OPERATION AND MAINTENANCE

- *STORMWATER OPERATION AND MAINTENANCE PLAN*
- *INSPECTION REPORT*
- *INSPECTION AND MAINTENANCE LOG FORM*
- *LONG-TERM POLLUTION PREVENTION PLAN*
- *ILLICIT DISCHARGE STATEMENT*
- *SPILL PREVENTION*
- *PROPOSED OPERATION AND MAINTENANCE MAP*

STORMWATER OPERATION AND MAINTENANCE PLAN

The Gardner School
0 Blue Hill Avenue
Map B7 Lot 5
Milton, MA

RESPONSIBLE PARTY DURING CONSTRUCTION:

Contractor, TBD

RESPONSIBLE PARTY POST CONSTRUCTION:

Viking Development LLC
302 Innovation Drive, Suite 130
Franklin, TN

Construction Phase

During the construction phase, all erosion control devices and measures shall be maintained in accordance with the final record plans, local/state approvals and conditions, the EPA Construction General Permit and the Stormwater Pollution Prevention Plan (SWPPP) if applicable. Additionally, the maintenance of all erosion / siltation control measures during construction shall be the responsibility of the general contractor. Contact information of the OWNER and CONTRACTOR shall be listed in the SWPPP for this site. The SWPPP also includes information regarding construction period allowable and illicit discharges, housekeeping and emergency response procedures. Upon proper notice to the property owner, the Town/City or its authorized designee shall be allowed to enter the property at a reasonable time and in a reasonable manner for the purposes of inspection.

Post Development Controls

Once construction is completed, the post development stormwater controls are to be operated and maintained in compliance with the following permanent procedures (note that the continued implementation of these procedures shall be the responsibility of the Owner or its assignee):

1. Parking lots: Sweep at least two (2) times per year and on a more frequent basis depending on sanding operations. All resulting sweepings shall be collected and properly disposed of offsite in accordance with MADEP and other applicable requirements.

   Approximate Maintenance Budget: $1,000/year

2. Catch basins, yard drains, manholes and piping: Inspect two (2) times per year and at the end of foliage and snow-removal seasons. These features shall be cleaned two (2) times per year or whenever the depth of deposits is greater than or equal to one half the depth from the bottom of the invert of the lowest pipe in the catch basin or underground system. Accumulated sediment and hydrocarbons present must be removed and properly disposed of off-site in accordance with MADEP and other applicable requirements.

   Approximate Maintenance Budget: $500/year per structure.

3. Riprap apron / Scour Hole: Riprap and scour holes should be checked at least annually and after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for displaced stones, slumping, and erosion at edges, especially downstream or downslope. If the riprap is damaged, it should be repaired before further damage can take place. Note and repair any erosion, stone displacement or low spots in the areas. Woody vegetation should be removed from the riprap annually.

   Approximate Maintenance Budget: $250/year per location.

4. Infiltration Basin: Preventative maintenance after every major storm event during the first three (3) months of operation and at least twice per year thereafter. Inspect structure and pretreatment BMP to ensure proper operation after every major storm event (generally equal or greater to 3.0 inches in 24 hours) for the first three months. Mow the buffer area, side slopes and basin bottom if grassed floor, rake if stone or sand bottom, remove trash and debris, remove grass clippings and accumulated organic matter. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

   Approximate Maintenance Budget: $2,000/year per basin

5. Forebays: The sediment forebay areas shall be inspected once per month to ensure they are operating as intended and that all components are stable and in working order. Inspections shall be by qualified personnel. During the growing season, the forebay shall be mowed at least twice, with additional cuttings performed as needed. All vegetation (i.e. tree saplings) will be removed from embankments and the forebay bottom. The inlet to the forebay shall be inspected for erosion and sedimentation, and riprap shall be promptly repaired as needed. Sediment forebays shall be cleaned quarterly and when sediment depth reaches half the height of the stone weir, or three to six feet, whichever is less. After sediment is removed, replace any vegetation damaged during the clean out by either reseeding or re-sodding. Any sediment removed shall be disposed of in accordance with MADEP and other applicable requirements.

   Approximate Maintenance Budget: $500/year per forebay

All components of the stormwater system will be accessible by the owner or their assignee.

STORMWATER MANAGEMENT SYSTEM

POST-CONSTRUCTION INSPECTION REPORT

LOCATION:

The Gardner School
0 Blue Hill Avenue
Map B7 Lot 5
Milton, MA

RESPONSIBLE PARTY:

Viking Development LLC
302 Innovation Drive, Suite 130
Franklin, TN

NAME OF INSPECTOR:	INSPECTION DATE:
Note Condition of the Following (sediment depth, debris, standing water, damage, etc.):	
Catch Basins:	
Discharge Points/ Flared End Sections / Rip Rap:	
Infiltration Basin:	
Sediment Forebay:	
Other:	

Note Recommended Actions to be taken on the Following (sediment and/or debris removal, repairs, etc.):
Catch Basins:
Discharge Points / Flared End Sections / Rip Rap:
Infiltration Basin:
Sediment Forebay:
Other:
Comments:

STORMWATER INSPECTION AND MAINTENANCE LOG FORM			
The Gardner School **_Blue Hill Avenue, Milton, MA_**			
Stormwater Management Practice	Responsible Party	Date	Maintenance Activity Performed

LONG-TERM POLLUTION PREVENTION PLAN

The Gardner School
0 Blue Hill Avenue
Map B7 Lot 5
Milton, MA

RESPONSIBLE PARTY DURING CONSTRUCTION:

Contractor, TBD

RESPONSIBLE PARTY POST CONSTRUCTION:

Viking Development LLC
302 Innovation Drive, Suite 130
Franklin, TN

For this site, the Long-Term Pollution Prevention Plan will consist of the following:

- The property owner shall be responsible for "good housekeeping" including proper periodic maintenance of building and pavement areas, curbing, landscaping, etc.
- Proper storage and removal of solid waste (dumpsters).
- Sweeping of parking lots, drive aisles and access aisles a minimum of twice per year with a commercial cleaning unit. Any sediment removed shall be disposed of in accordance with applicable local and state requirements.
- Regular inspections and maintenance of Stormwater Management System as noted in the "O&M Plan".
- Snow removal shall be the responsibility of the property owner. Snow shall not be plowed, dumped and/or placed in forebays, infiltration basins or similar stormwater controls. Salting and/or sanding of pavement / walkway areas during winter conditions shall only be done in accordance with all state/local requirements and approvals.
- Reseed any bare areas as soon as they occur. Erosion control measures shall be installed in these areas to prevent deposits of sediment from entering the drainage system.
- Grass shall be maintained at a minimum blade height of two to three inches and only 1/3 of the plant height shall be removed at a time. Clippings shall not be disposed of within stormwater management areas or adjacent resource areas.

- Plants shall be pruned as necessary.

- Snow piles shall be located adjacent to or on pervious surfaces in upland areas. This will allow snow melt water to filter into the soil, leaving behind sand and debris which can be removed in the springtime.

- If necessary, stockpiled snow will be removed from the Site and disposed of at an off-site location in accordance with all local, state and federal regulations.

- The amount of sand and deicing chemicals shall be kept at the minimum amount required to provide safe pedestrian and vehicle travel.

- Deicing chemicals are recommended as a pretreatment to storm events to minimize the amount of applied sand.

OPERATON AND MAINTENANCE TRAINING PROGRAM

The Owner will coordinate an annual in-house training session to discuss the Operations and Maintenance Plan, the Long-Term Pollution Prevention Plan, and the Spill Prevention Plan and response procedures. Annual training will include the following:

Discuss the Operations and Maintenance Plan:

- Explain the general operations of the stormwater management system and its BMPs
- Identify potential sources of stormwater pollution and measures / methods of reducing or eliminating that pollution
- Emphasize good housekeeping measures

Discuss the Spill Prevention and Response Procedures:

- Explain the process in the event of a spill
- Identify potential sources of spills and procedures for cleanup and /or reporting and notification
- Complete a yearly inventory or Materials Safety Data sheets of all tenants and confirm that no potentially harmful chemicals are in use.

ILLICIT DISCHARGE STATEMENT

Certain types of non-stormwater discharges are allowed under the U.S. Environmental Protection Agency Construction General Permit. These types of discharges will be allowed under the conditions that no pollutants will be allowed to come in contact with the water prior to or after its discharge. The control measures which have been outlined previously in this LTPPP will be strictly followed to ensure that no contamination of these non-storm water discharges takes place. Any existing illicit discharges, if discovered during the course of the work, will be reported to MassDEP and the local DPW, as applicable, to be addressed in accordance with their respective policies. No illicit discharges will be allowed in conjunction with the proposed improvements.

Duly Acknowledged:

Chris Fazendin August 27, 2024

Chris Fazendin, VP Real Estate Development | The Gardner School

Name & Title Date

SPILL PREVENTION AND RESPONSE PROCEDURES (POST CONSTRUCTION)

In order to prevent or minimize the potential for a spill of Hazardous Substances or Oil or come into contact with stormwater, the following steps will be implemented:

1. All Hazardous Substances or Oil (such as pesticides, petroleum products, fertilizers, detergents, acids, paints, paint solvents, cleaning solvents, etc.) will be stored in a secure location, with their lids on, preferably under cover, when not in use.

2. The minimum practical quantity of all such materials will be kept on site.

3. A spill control and containment kit (containing, for example, absorbent materials, acid neutralizing powder, brooms, dust pans, mops, rags, gloves, goggles, plastic and metal trash containers, etc.) will be provided on site.

4. Manufacturer's recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.

5. It is the OWNER's responsibility to ensure that all Hazardous Waste on site is disposed of properly by a licensed hazardous material disposal company. The OWNER is responsible for not exceeding Hazardous Waste storage requirements mandated by the EPA or state and local authorities.

In the event of a spill of Hazardous Substances or Oil, the following procedures should be followed:

1. All measures should be taken to contain and abate the spill and to prevent the discharge of the Hazardous Substance or Oil to stormwater or off-site. (The spill area should be kept well ventilated and personnel should wear appropriate protective clothing to prevent injury from contact with the Hazardous Substances.)

2. For spills of less than five (5) gallons of material, proceed with source control and containment, clean-up with absorbent materials or other applicable means unless an imminent hazard or other circumstances dictate that the spill should be treated by a professional emergency response contractor.

3. For spills greater than five (5) gallons of material immediately contact the MADEP at the toll-free 24-hour statewide emergency number: **1-888-304-1133**, the local fire department (**9-1-1**) and an approved emergency response contractor. Provide information on the type of material spilled, the location of the spill, the quantity spilled, and the time of the spill to the emergency response contractor or coordinator, and proceed with prevention, containment and/or clean-up if so desired. (Use the form provided, or similar).

4. If there is a Reportable Quantity (RQ) release, then the National Response Center should be notified immediately at (800) 424-8802; within 14 days a report should be submitted to the EPA regional office describing the release, the date and circumstances of the release and the steps taken to prevent another release. This Pollution Prevention Plan should be updated to reflect any such steps or actions taken and measures to prevent the same from reoccurring.

SPILL PREVENTION CONTROL AND COUNTERMEASURE FORM

The Gardner School
0 Blue Hill Avenue
Map B7 Lot 5
Milton, MA

Where a release containing a hazardous substance occurs, the following steps shall be taken by the facility manager and/or supervisor:

1. Immediately notify The Town Fire Department (at **9-1-1**)

2. All measures must be taken to contain and abate the spill and to prevent the discharge of the pollutant(s) to off-site locations, receiving waters, wetlands and/or resource areas.

3. Notify the Town Health Department at (617) 898-4800 and the Town Conservation Commission at (617) 898-4974.

4. Provide documentation from licensed contractor showing disposal and cleanup procedures were completed as well as details on chemicals that were spilled to the Town Health Department and Conservation Commission.

Date of spill:_____ Time:_____ Reported By:_____

Weather Conditions:_____

Material Spilled	**Location of Spill**	**Approximate Quantity of Spill (in gallons)**	**Agency(s) Notified**	**Date of Notification**

Cause of Spill: _____

_____

Measures Taken to Clean up Spill: _____

_____

Type of equipment: _____ Make: _____ Size: _____

License or S/N: _____

Location and Method of Disposal _____

_____

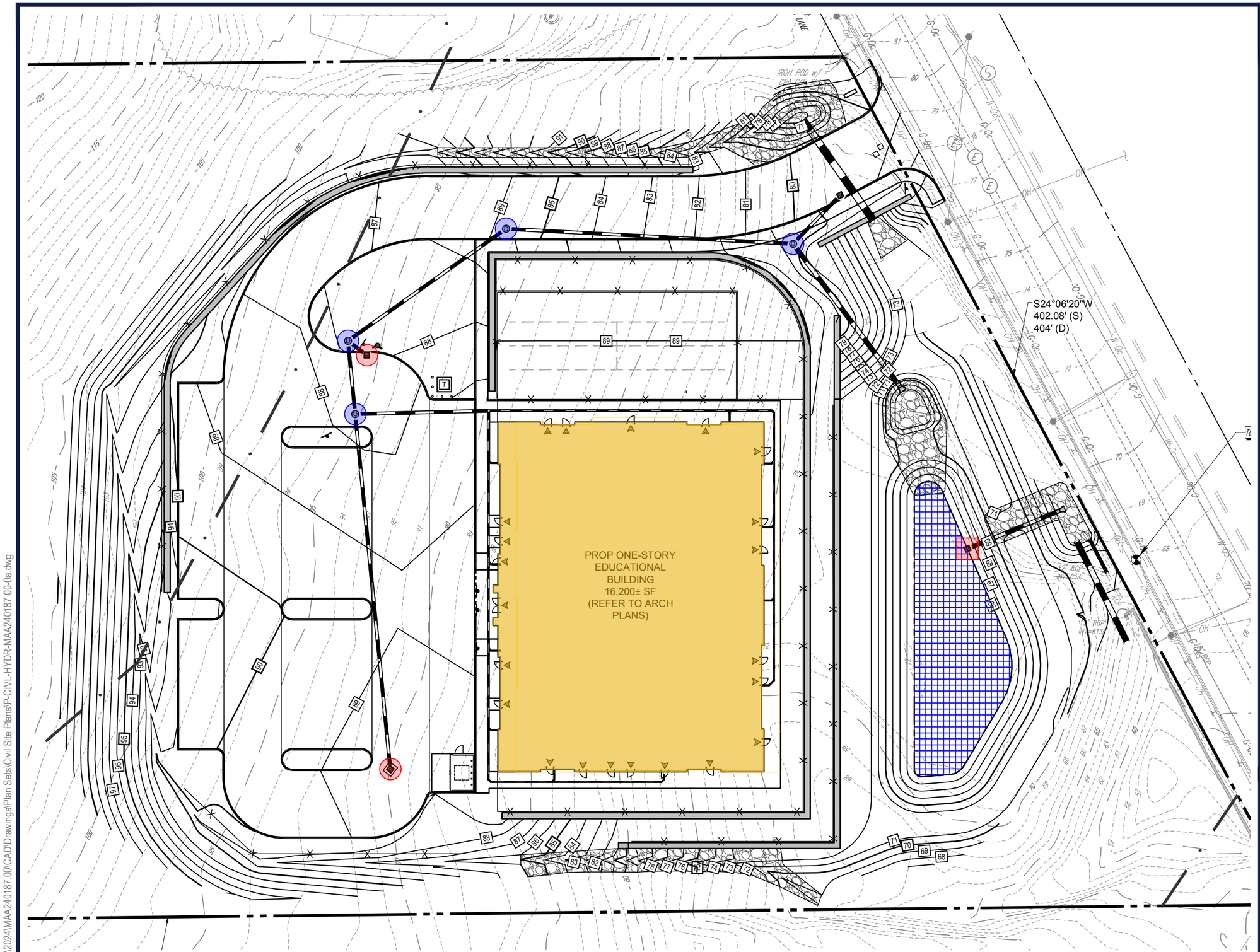
Procedures, method, and precautions instituted to prevent a similar occurrence from recurring: _____

_____

_____

Additional Contact Numbers:

- DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) EMERGENCY PHONE: 1-888-304-1133
- NATIONAL RESPONSE CENTER PHONE: (800) 424-8802
- U.S. ENVIRONMENTAL PROTECTION AGENCY PHONE: (888) 372-7341



LEGEND

- CATCH BASIN ("PROP. CB") (SINGLE AND DOUBLE)
- OUTLET CONTROL STRUCTURE ("PROP. OCS")
- MANHOLE ("PROP. DMH")
- INFILTRATION BASIN

OPERATION AND MAINTENANCE LOCATION MAP

0 BLUE HILL AVENUE
MILTON, MASSACHUSETTS

PREPARED BY

BOHLER

SCALE:1"=40' DATE: 08/28/2024

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