Stormwater Report

35 Village Road
Middleton, Massachusetts 01949

35 Village Road

December 19, 2025

JOB NO: ENG25-0131

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TABLE OF CONTENTS

Project Narrative:

Ferncroft Apartments, LLC, (the "Applicant") seeks to construct two (2) multi-family residential structures to create 200 multifamily rental dwelling units on a portion of the land at 35 Village Road in Middleton, MA (Assessor's Map 21, Parcel 5) and depicted on the Figure 1, below, with a scaled portion of the USGS map provided as Attachment A to this report.

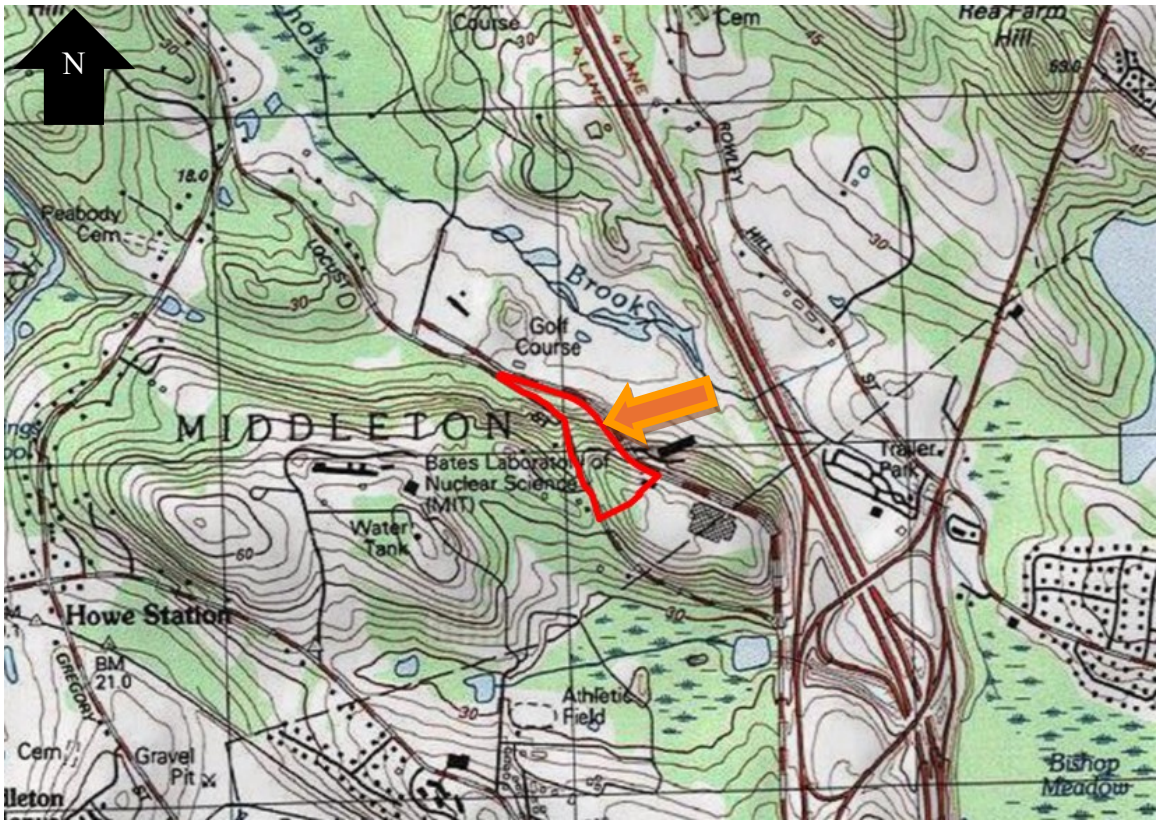


Figure 1-USGS Vicinity Map

A portion of this parcel is currently improved by Ferncroft Corporate Center consisting of commercial site amenities including parking, driveway access, open space, an existing 8-story, 234,556 square-foot office building and an adjacent, existing six level parking garage (2-stories above ground) having a 69,100 square-foot footprint with a paved surface parking lot along the eastern side of the Site. The Site is served by municipal water and wastewater (via the Town of Danvers) and has an existing on-site structured drainage system that discharges to an existing concrete swale along the southerly side of Village Road, a public right-of-way.

The Applicant seeks to construct the Ferncroft Apartments (or "the Project") consisting of 200 units, to be located on an underutilized portion of a 12.57+/- acre

site. As part of the project the parcel is proposed to be divided into two separate lots to separate the area of the existing commercial use to include the existing office building, existing parking garage, and related improvements (Lot A), and a second lot proposed for the new residential Project which is the subject of this Application encompassing the two new multifamily residential buildings and appurtenant areas as the area of the Chapter 40B Project (Lot B).

Proposed site work will include, but is not limited to, grading, retaining walls, drainage, utilities, paving and landscaping associated with the residential buildings.

Pre-Development (Existing) Uses & Site Conditions:

The Site is currently underutilized with development clustered to the southerly portion of the property with several areas of impervious coverage associated with the existing office building, vehicular access, parking structure and surface parking areas. Vegetated areas exist in landscape onsite and trees along all property boundaries. The existing building onsite is currently occupied with various businesses.

There is no evidence of exposed bedrock, streams, rivers, or wetlands onsite, nor are there any buffer zones associated with any wetlands on the property. The Site is not within the vicinity of any Priority or Estimated Habitat protected under Mass Wildlife's Natural Heritage & Endangered Species Program.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Essex County, Massachusetts, Map Number 25009C0401G, City of Middleton Community Number 250094, Panel Number 0401G, having an effective date of July 8, 2025, the Site is not located within any FEMA floodplain or floodway. A portion of this panel is provided in Attachment B to this report.

Natural Resources Conservation Service (NRCS) soil mapping describes the site as being a mixture of Udorthents-Urban (Map Unit Symbol 651) and varying slopes of Paxton fine sandy loam (Map Unit Symbol 305B, 305C, and 305D). Web soil survey mapping information can be found in Attachment B.

Weston and Sampson conducted confirmatory soil testing on November 19th, 2025, to verify soil type and depth to estimated seasonal high-water table. The subsurface exploration test pit logs can be found in Attachment C of this report.

Pre-Development Condition Hydrology:

The parcel currently slopes from Locust Street toward Village Road where surficial runoff is collected by a concrete swale and conveyed to the drainage system within Village Road. The site's topography includes a ridge adjacent to the roadway along Locust Street southwestern of the proposed development. This stormwater analysis

generally defined watershed areas through surficial topography. In the developed, southeast portion of the site, there are several onsite catch basins that collect runoff and drain to a 12-inch storm drain which discharge into an existing detention pond onsite. This detention pond discharges onto the slope and ultimately flows run overland to the above referenced concrete swale. An existing 30-inch storm drain runs parallel to Locust Street in a northwesterly direction before turning north and bisecting the site. The existing 30-inch storm drain also connects to the structured drainage system within Village Road. Offsite flows tributary to an existing 30" culvert crossing the site were assumed to remain constant and excluded from the analysis.

A single point of analysis (POA) was defined at the downstream catch basin inlet within the existing concrete drainage swale in Village Road, identified as POA-1. This POA is also at the confluence of the above-mentioned 30-inch culvert. Figure 1 of Attachment D is the pre-development drainage area map, which displays the limits of the pre-development drainage areas, time of concentration flow paths, and existing land coverages. Figure 1 also identifies the POA for the hydrologic analysis which remains consistent from pre- to post-development. The drainage areas in pre-development conditions are described below:

- Drainage Area E1 – Central portion draining to existing 12-inch storm drain.
- Drainage Area E2 – Northwestern portion of property draining to existing detention pond.
- Drainage Area E3 – Northeast corner draining toward Drainage Area E4.
- Drainage Area E4 – Central northeast portion draining to Drainage Area E6.
- Drainage Area E5 – Northwestern corner draining toward Drainage Area E6.
- Drainage Area E6 – Northwestern portion draining toward Drainage Area E7.
- Drainage Area E7 – Northwestern corner draining to POA-1.

Post-Development (Proposed) Uses & Site Conditions:

The Applicant seeks to construct 200 residential apartment units within two (2) buildings to be constructed at the site while maintaining most of the existing commercial improvements at the site. Building A is proposed to be constructed at the existing, elevated parking lot to the east of the existing, multi-story parking garage. Building B is proposed in the general vicinity of the existing detention basin within the wooded portion of the lot to the north of the existing, multi-story parking garage. The residential and commercial uses propose to share parking to the extent practicable to minimize the creation of unnecessary impervious surfaces. Through the shared parking and reuse of the existing parking deck the proposed Project, exclusive of roof top surfaces, results in a net increase of 297-square feet

(SF) of paved, impervious surfaces when compared to the pre-development conditions.

Post-Development Condition Hydrology:

The post-development conditions analysis evaluates the land coverage changes and stormwater features associated with the proposed project. The post-development conditions are designed to maintain the site's natural drainage paths to the maximum extent practicable while mitigating any potential negative impacts from site development. The project seeks to redevelop portions of the site and minimize increases in impervious surfaces to the extent practicable.

The proposed stormwater management system consists of an sub-surface infiltration system for roof runoff along with catch basins, underground storm pipes, water quality units, and three stormwater basins for treating and conveying surficial runoff.

The POA and their associated drainage areas generally remain consistent from pre- to post-development conditions. Each stormwater best management practice (BMP) has its corresponding drainage area(s) and time of concentration path. Figure 2 of Attachment D is the post-development drainage area map, which displays the limits of the post-development drainage areas, time of concentration flow paths, and proposed land coverages. The drainage areas in post-development conditions are described below:

- Drainage Area P1 – Proposed Building B drains to underground stormwater storage area 1P.
- Drainage Area P2 – Proposed Building A drains to underground stormwater storage area 1P.
- Drainage Area P3 – Northeastern bottom portion of site follows existing drainage pattern and drains to POA-1.
- Drainage Area P4 – Central portion of site that drains to stormwater basin 2P.
- Drainage Area P5 – Southwest portion of site that drains to stormwater basin 3P.
- Drainage Area P6 – Western corner of site that drains to stormwater basin 4P.
- Drainage Area P7 – Southwest corner of site that connects to the existing 30-inch storm drain at the site.

Methodology:

Runoff calculations were performed in accordance with the the NRCS Soil Conservation Service (SCS) method as defined in Technical Release 55 (TR-55) and Technical Release 20 (TR-20) which are the basis for they HydroCAD® hydrologic model. Cover conditions and times of concentrations were used to generate runoff hydrographs for each of the sub-catchments for the each of the Type III design storms with precipitation rates identified in NOAA Atlas 14, as identified in Table 1.

Table 1 - Design Storms – NOAA Atlas 14

DESIGN STORM (RETURN FREQUENCY)	RAINFALL (INCHES/24-HOURS)
2-year	3.25
10-year	4.91
100-year	8.86

Compliance with Storm Water Management Standards:

Although the proposed subdivision is not located within areas under jurisdiction of the Massachusetts Department of Environmental Protection's (MaDEPs) Wetlands Protection Act (WPA), the proposed storm water management system has been designed to comply with the ten (10) standards of the MaDEP Storm Water Management Policy to the maximum extent practicable. Each of the standards and the extent of Project compliance are summarized below.

Standard 1: No New Untreated Discharges

No new storm water conveyances (e.g. outfalls) may discharge untreated storm water directly to or cause erosion in wetlands or waters of the Commonwealth.

The proposed project does not create any new untreated discharges. Total impervious area will be increased in comparison with existing conditions by approximately 43,560-SF. As described above 43,263-SF of this increase is attributed to impervious surfaces associated with the rooftop areas from the proposed residential buildings. The Massachusetts Stormwater Handbook recognizes runoff from rooftops as being "clean" not requiring treatment prior to infiltration, as such the net increase in impervious surfaces requiring treatment at

the project site is 297-SF. New impervious areas will now undergo treatment via street sweeping, deep sump hooded catch basins, hydrodynamic separators, and/or subsurface infiltration and extended detention basins. As such, existing stormwater discharges will meet Standard 1.

Standard 2: Peak Rate Attenuation

Storm water management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

Storm water management controls to mitigate peak rates of runoff from the Project were developed for the 2, 10, and 100-year, 24-hour, Type III design storm events. As previously stated, runoff calculations were performed in accordance with the methodology outlined in the NRCS Soil Conservation Service (SCS) methods as defined in Technical Release 55 (TR-55) and Technical Release 20 (TR-20) which are the basis for they HydroCAD® hydrologic model. Calculations are provided as Attachment D to this report. Table 2, below summarized pre- and post-development peak rates of runoff to the design point.

Table 2 – Peak Rate of Runoff

	Peak Flow Rate in Cubic Feet Per Second (CFS)			
Point of Analysis	24-hour Storm Event	Pre-Development Peak Runoff (cfs)	Poste Development Peak Runoff (cfs)	Difference in Peak Runoff (cfs)
POA1	2	8.8	8.7	-0.1
	10	20.0	18.6	-1.4
	100	37.7	32.4	-5.3

The Project, as designed, will decrease peak flow rate of runoff to the Point of Analysis in each of the analyzed design storm events when compared to the existing site conditions.

Standard 3: Recharge

Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration ... At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the storm water management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Storm Water Handbook.

The Project approximates the annual recharge to groundwater through the use of structural and non-structural best management practices (BMPs) including a proposed subsurface infiltration system that infiltrates clean roof runoff, as well as through implementation of the proposed long-term operations and maintenance plan.

In accordance with the Massachusetts Storm Water Handbook the required recharge volume (Rv) for the Project equals a depth of runoff corresponding to the soil type time the impervious areas covering that soil type at the post-development site.

As previously stated and documented in Appendix A, soils on-site vary and include Groups A, B, C and D. The target depth factor (F) identified by hydrologic soil type is identified in Table 2.3.2: Recharge Depth by Hydrologic Soil Group of the Massachusetts Storm Water Handbook (and included as Table 3, below).

Table 3 - Recharge Target Depth by Hydrologic Soil Group

NRCS HYDROLOGIC SOIL TYPE	APPROX. SOIL TEXTURE	TARGET DEPTH FACTOR (F)
A	sand	0.6-inch
B	loam	0.35-inch
C	silty loam	0.25-inch
D	clay	0.1-inch

As previously described, a portion of the site was previously developed and as such qualifies as a redevelopment project (see Standard 7 below). Standard 3 isl met through structural best management practices (BMPs) including one (1) subsurface infiltration basin and three (3) extended detention basins to provide recharge on site. The BMPs are designed to capture and infiltrate the required recharge volume for the increase in impervious areas being proposed. Supporting calculations can be found in Attachment E of this report.

Compliance with Standard 3 and compliance with draw-down standards are summarized in the tables below.

Table 4 – Recharge and Drawdown Calculations Pond SSIS1

SSIS1					
Hydrologic Soil Group	A	B	C	D	Total
Total Proposed Increase Impervious Area (acres)	0.00	0.00	0.99	0.00	0.99
Target Factor (inches)	0.60	0.35	0.25	0.10	-
Required Recharge Volume (cubic feet)	0	0	901	0	901
Recharge Volume Below Lowest Outlet (cubic feet)					3764
Drawdown Time					
Saturated Hydraulic Conductivity (Rawls Rate in/hr)					0.27
Area of Bottom of Basin (square feet)					2502
Drawdown Time (hours)					66.9

Table 5 – Recharge and Drawdown Calculations Pond 2P

2P (Upper Pond Building B) - Note credit for 42,328 sf in Existing Impervious Results in no net increase.					
Hydrologic Soil Group	A	B	C	D	Total
Total Proposed Increase Impervious Area (acres)	0.00	0.00	0.00	0.00	0.00
Target Factor (inches)	0.60	0.35	0.25	0.10	-
Required Recharge Volume (cubic feet)	0	0	0	0	0
Recharge Volume Below Lowest Outlet (cubic feet)					0
Drawdown Time					
Saturated Hydraulic Conductivity (Rawls Rate in/hr)					0.27
Area of Bottom of Basin (square feet)					300
Drawdown Time (hours)					0.0

Table 6 – Recharge and Drawdown Calculations Pond 3P

3P (Lower Pond Building B) - Note credit for 4,342 sf in Existing Impervious Results in no net increase.					
Hydrologic Soil Group	A	B	C	D	Total
Total Proposed Increase Impervious Area (acres)	0.00	0.00	0.00	0.00	0.00
Target Factor (inches)	0.60	0.35	0.25	0.10	-
Required Recharge Volume (cubic feet)	0	0	0	0	0
Recharge Volume Below Lowest Outlet (cubic feet)					0
Drawdown Time					
Saturated Hydraulic Conductivity (Rawls Rate in/hr)					0.27
Area of Bottom of Basin (square feet)					175
Drawdown Time (hours)					0.0

Table 7 – Recharge and Drawdown Calculations Pond 4P

4P (Pond West of Building B) - Note credit for 7,287 sf in Existing Impervious results in 243 sf. increase					
Hydrologic Soil Group	A	B	C	D	Total
Total Proposed Increase Impervious Area (acres)	0.00	0.00	0.01	0.00	0.01
Target Factor (inches)	0.60	0.35	0.25	0.10	-
Required Recharge Volume (cubic feet)	0	0	5	0	5
Recharge Volume Below Lowest Outlet (cubic feet)					75
Drawdown Time					
Saturated Hydraulic Conductivity (Rawls Rate in/hr)					0.27
Area of Bottom of Basin (square feet)					400
Drawdown Time (hours)					8.3

Standard 4: Water Quality

Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). The standard is met with pollution prevention plans, storm water best management practices sized to capture the required water quality volume, and pretreatment measures.

Stormwater from impervious parking and driveway areas on the site will undergo treatment to provide a minimum of 80% TSS removal. Stormwater will undergo pre-treatment from deep sump catch basins, hydrodynamic separators prior to discharging into extended detention basins. Clean rooftop runoff will be recharged via a subsurface infiltration system. Although qualifying as a partial redevelopment project (see Standard 7, below) the project has been designed to all impervious surfaces on-site tributary to the POA. Supporting calculations can be found in Attachment E of this report and summarized in Table 8.

B	C	D	E	F
BMP Type	TSS Removal Rate	Starting TSS Load	Amount Removed (C x D)	Remaining Load (D - E)
Street Sweeping	0.05	1.00	0.05	0.95
Deep Sump & Hooded Catch Basins	0.25	0.75	0.19	0.54
Swirl Particle Separator	0.50	0.54	0.27	0.27
Extended Dry Detention Basin	0.50	0.27	0.14	0.13
			Total TSS Removal = 87%	

During project construction, appropriate BMPs will be used to minimize sedimentation and soil erosion as further described in Standard 8, below.

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

For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Storm Water Handbook to eliminate or reduce the discharge of storm water runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and storm water runoff, the proponent shall use the specific structural storm water BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Storm Water Handbook. Storm water discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean

Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Standard 5 is not applicable to the Project. The Project is not associated with uses that will subject the site to higher potential pollutant loads as defined in the MaDEP Wetlands and Water Quality regulations.

Land Uses with Higher Potential Pollutant Loads (LUHPPLs) are identified in 310 CMR 22.20B(2) and C(2) a through k and m and in 310 CMR 22.21(2)(a) 1 through 8 and (b) 1 through 6; areas within a site that are the location of activities that are subject to an individual National Pollutant Discharge Elimination System (NPDES) permit or the NPRDE Multi-Sector General Permit; automotive fueling facilities, exterior fleet storage areas, exterior vehicle service and equipment cleaning areas; marinas and boatyards; parking lots with high-intensity use; confined disposal facilities and disposal sites.

Standard 6: Critical Areas

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

The Project is not located within nor discharges to a Critical Area.

Standard 7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

A redevelopment project is required to meet the following Storm Water Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing storm water discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Storm Water Management Standards and improve existing conditions.

Portions of the site are considered redevelopment and comply to the applicable standards to the maximum extent practicable.

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

A plan to control construction-related impacts, including erosion sedimentation and other pollutant sources during construction and land disturbance activities

(construction period erosion, sedimentation, and pollution prevention plan), must be developed and implemented.

A detailed Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan is included in Attachment H. To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction. To ensure that the work incorporates the performance standards recommended in the DEP's Stormwater Management Policy, necessary erosion and sedimentation control measures will be utilized during construction, as depicted on the site plans.

Standard 9: Operation and Maintenance Plan

A long-term operation and maintenance plan must be developed and implemented to ensure that storm water management systems function as designed.

An operations and maintenance plan is included in Attachment G.

Standard 10: Prohibition of Illicit Discharges

All illicit discharges to the storm water management system are prohibited.

Illicit discharges to the storm water management system are discharges that are not entirely comprised of storm water. Discharges to the storm water management system from the following activities or facilities are permissible:

- Firefighting
- Water Main Flushing
- Landscape Irrigation
- Uncontaminated Groundwater
- Potable Water Sources
- Foundation Drains
- Air Conditioning Condensation
- Footing Drains
- Individual Resident Car Washing
- Flows from Riparian Habitats and Wetlands
- Dechlorinated Water from Swimming Pools
- Water Used for Street Sweeping
- Water Used to Clean Residential Buildings (without detergents)

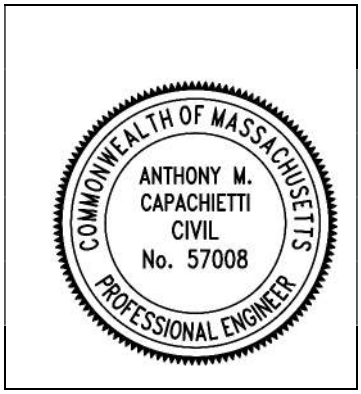
All other illicit discharges to the storm water management system are prohibited. There are no known illicit discharges anticipated through the completion of this project.

An illicit discharge compliance statement has been included in Attachment I.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including any relevant soil evaluations, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan, the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement 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



12/19/25

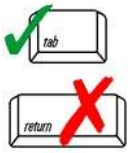
Signature and Date

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

Checklist for Stormwater Report

A. Introduction

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



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

The Stormwater Report must include:

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

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

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

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

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

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

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

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

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

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

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

Registered Professional Engineer's Certification

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

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

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

☐ New development

☐ Redevelopment

☒ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

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

☒ No disturbance to any Wetland Resource Areas

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

☐ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

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

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

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): _____

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

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

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

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

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

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

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

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

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

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

Standard 4: Water Quality

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

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

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

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

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

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

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

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

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

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

☐ All exposure has been eliminated.

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

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

Standard 6: Critical Areas

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

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

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

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

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

Checklist for Stormwater Report

Checklist (continued)

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

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

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

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

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

Standard 9: Operation and Maintenance Plan

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

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

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

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

Standard 10: Prohibition of Illicit Discharges

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

☒ An Illicit Discharge Compliance Statement is attached;

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