

Edgartown Stop & Shop Expansion

235-237 Upper Main Street
Edgartown, Massachusetts

PREPARED FOR

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PREPARED BY



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Table of Contents

Project Summary	1
Existing Conditions	4
Summary	4
Hydrologic Information.....	5
Proposed Conditions.....	7
Summary	7
Water Quantity and Quality Control	8
Site Layout	8
Source Control	8
Snow Management	8
Spill Prevention	8
Catch Basins with Sumps and Oil/debris Traps and Trench Drains.....	8
Water Quality Units	8
Subsurface Infiltration System	9
Hydrologic/Hydraulic Analysis.....	11
Hydrologic Analysis	11
Hydraulic Analysis.....	12
Stormwater Management Regulations.....	13
Stormwater Regulations and Permitting.....	13
Stormwater Management Standards and Guidelines.....	14
Federal NPDES Construction-Related General Stormwater Permits.....	16

List of Tables

Table No.	Description	Page
Table 1	Peak Discharge Rates (cfs*)	11

List of Figures

Figure No.	Description	Page
Figure 1	Site Locus Map	3
Figure 2	Existing Drainage Areas.....	6
Figure 3	Proposed Drainage Areas.....	10

List of Appendices

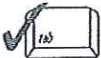
Appendix No.	Description
Appendix A	Existing and Proposed Watershed Maps
Appendix B	NRCS Soil Survey Information and On-Site Subsurface Investigation
Appendix C	FEMA Flood Map
Appendix D	TSS Removal
Appendix E	Long Term Stormwater Operation and Maintenance Plan and Spill Prevention Manual
Appendix F	Hydraulic Analysis - StormCAD Analysis
Appendix G	Erosion and Sedimentation Control Measures
Appendix H	Illicit Discharge Compliance Statement
Appendix I	Hydrologic Analysis HydroCAD Analysis: Existing Conditions HydroCAD Analysis: Proposed Conditions



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 8²
- 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.



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.

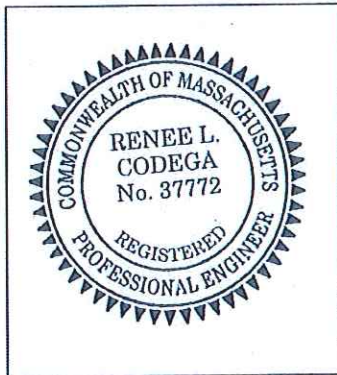
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the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



Renee L. Codega 6/30/17

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 Field¹
- 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 proprietary 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.



1

Project Summary

The 3.7-acre Site is located at 435 Upper Main Street in Edgartown, Massachusetts (see Figure 1). The Site is Lot 15.11, 15.12, 57.1, 57.2, 57.3, 58, 59, 87.1, 87.2 as shown on Assessor's Plat 20A. The Site is currently zoned B-II Business District. The Site is located within the "Islands" DEP major watershed and the "Eel Pond" Martha's Vineyard minor watershed. There are no wetland resources on the Site. The site is located within a Non-Potential Drinking Water Source Area (NPDWSA).

The Site is presently occupied by a Stop & Shop supermarket, Edgartown National Bank and associated parking, utilities, and landscaping. Recently, a one-story residential structure was demolished. Under existing conditions stormwater from the commercially developed areas of the Site is contained and infiltrated through subsurface leaching galleys. There is no stormwater discharge to Upper Main Street. Undeveloped portions of the Site discharge offsite to the north and east.

The proposed development of the site includes the expansion of the existing Stop & Shop and the relocation of the Edgartown National Bank, with associated parking and landscaping. Only the disturbed portion of the Site (approximately 2.5 acres) is considered for this stormwater analysis. Under proposed conditions, stormwater runoff will continue to be managed onsite through an additional subsurface infiltration structure. Wherever possible existing drainage and grading patterns were maintained in the proposed design.

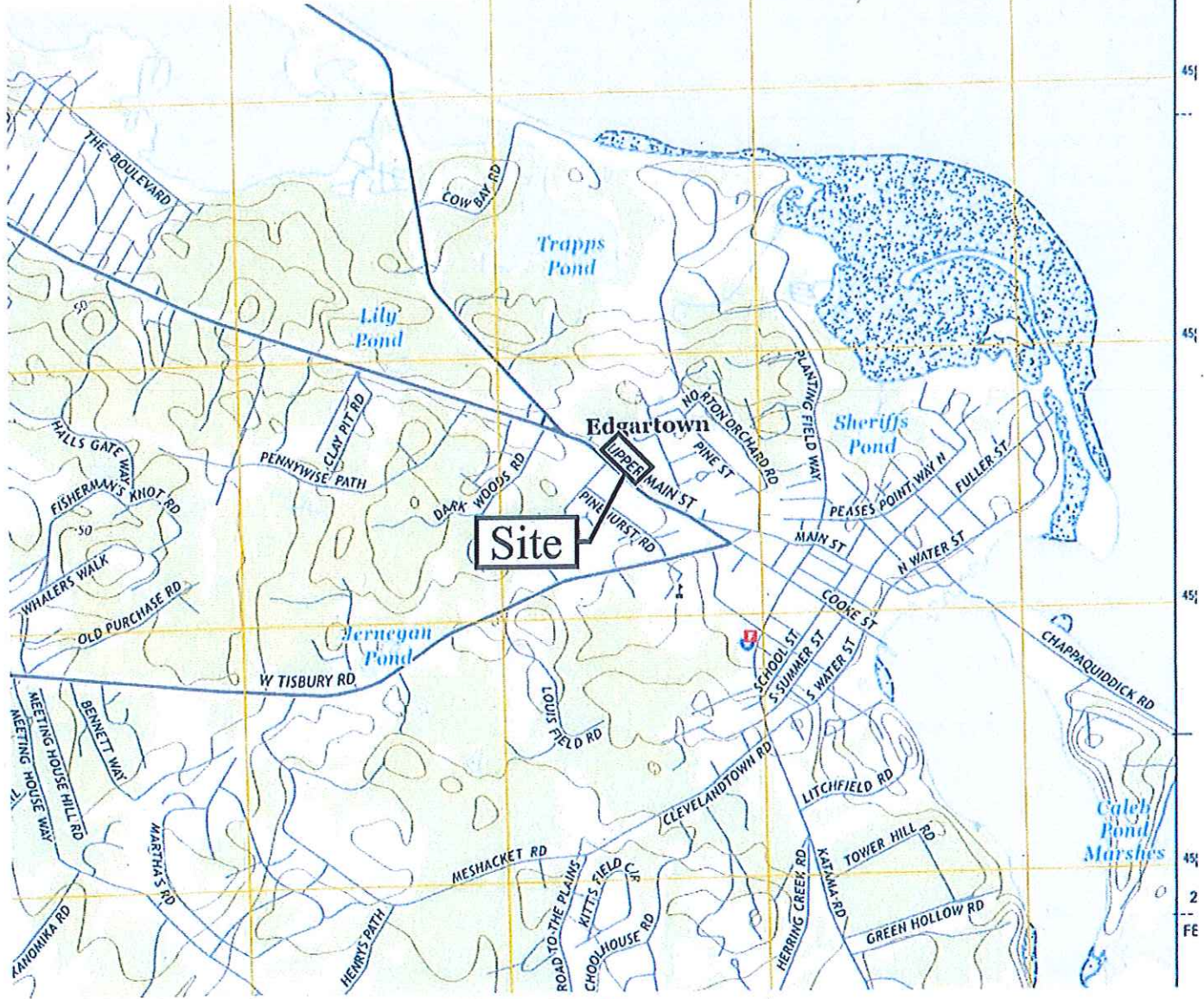
A HydroCAD model, using TR-20 methodology, was developed to evaluate the existing and proposed drainage conditions on the Site. The results of the analyses indicate that there is no increase in peak discharge rates between the pre- and post-development conditions 2-year, 10-year, and 100-year storm events. The pre- and

post-development peak discharge values are presented in Table 1 at the end of this report.

The Stormwater Management Plan (the Plan), including Best Management Practices (BMPs) for maintaining stormwater runoff quality both during and after construction, was prepared in accordance with the applicable local, state, and federal regulations. Details of the Plan are provided herein.

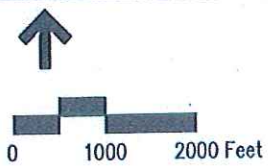


Site Location Key



Source: USGS Quadrangles

Vanasse Hangen Brustlin, Inc.



Site Location Map
222 Upper Main Street
Edgartown, Massachusetts

Figure 1



2

Existing Conditions

Summary

The approximately 3.7-acre Site is occupied by a Stop & Shop supermarket, Edgartown National Bank, and associated parking, utilities, and landscaping. There is approximately 0.6 acres of undeveloped forested land in the northern portion of the Site. See Figure 2.

The project is not located within the 100-year flood plain as shown on FEMA Map 25007C0119H dated July 6, 2010 and included in **Appendix C**.

The northern portion of the site is primarily wooded with grades generally ranging from 1%-3%. The remainder of the site consists of buildings, walkways, grassed areas, and paved parking with grades ranging from 1%-7%. Elevations range from approximately 16' at the northern portion of the Site to 23' at the southwestern portion of the Site.

The Natural Resource Conservation Service (NRCS) has mapped the soil types at the Site as the following: Carver Loamy Coarse Sand (HSG A) and Urban Land (HSG A). Based on the on-site explorations performed by GZA GeoEnvironmental, Inc. in September 2015, the in-situ soils are predominantly a loamy sand texture. The NRCS map and the test pit logs are attached in **Appendix B**.

Under existing conditions, stormwater from the commercially developed areas of the Site is contained and infiltrated through subsurface leaching galleys. A portion of the supermarket roof discharges at grade and offsite to the east. The roof plans are

unavailable making the quantity of stormwater discharged in this direction unknown; therefore, this runoff was conservatively considered to be retained on-site.

However, it should be noted that the existing stormwater flows to off-site areas will not be increased under the proposed conditions. Similarly, the discharge point for runoff generated in the northern portion of the bank parking lot cannot be determined, and was therefore also considered to be retained on-site. There is no known stormwater discharge to Upper Main Street. Undeveloped portions of the Site discharge offsite to the north and east.

Hydrologic Information

For the existing conditions hydrologic analysis, the site was divided into three drainage areas that contribute to two design points where peak discharge rates were evaluated (see Figure 2). Runoff from the developed portions of the Site is predominately infiltrated on-site through subsurface leaching galleys. One of the galley systems in the front of the building is experiencing diminished capacity, therefore, the flows to that system will be diverted to the new infiltration system. Peak discharge rates were not analyzed for these areas because stormwater does not leave the Site. The remaining design points are locations where runoff exits the site to adjacent properties to the north and east.

- › **Drainage Area 1** - This 0.41 acre area is densely wooded, with a small portion of paved parking associated with the adjacent property to the north. This drainage system contributes to Design Point 1.
- › **Drainage Area 2** - This 0.45 acre area is also predominately densely wooded discharging to the adjacent property to the east. This drainage area also includes the residential structure located behind the supermarket. This drainage system contributes to Design Point 2.
- › **Drainage Area 3** - This 1.59 acre area considered to be the commercially developed portion of the Site, including the supermarket, bank, and all associated parking and landscaping. For the purposes of this analysis, all runoff generated from this drainage area is considered to be infiltrated onsite and therefore does not contribute to a design point.



3

Proposed Conditions

Summary

The project, which will include the relocation of the existing bank and the construction of approximately 16,400 square feet of additional supermarket space, was designed to comply with the Massachusetts Stormwater Management Policy. The Site is considered a Land Use with Higher Potential Pollutant Loads (LUHPPL) due to its estimated daily vehicle-trips.

Existing drainage and grading patterns were maintained to the maximum extent possible. By infiltrating one-hundred percent of the runoff from the proposed development, the Site design will reduce peak runoff rates, maximize groundwater recharge, and treat for water quality.

Water quality is provided by a combination of deep-sump hooded catch basins, proprietary water quality units (providing hydrodynamic separation), and subsurface infiltration chambers. Each treatment train provides at least 80% TSS removal prior to infiltration, with at least 44% TSS removal provided in pretreatment.

Details of the stormwater water management system features are as follows:

Water Quantity and Quality Control

Site Layout

Existing drainage patterns have been maintained to the maximum extent practicable, with most stormwater runoff being retained onsite and infiltrated to groundwater. Existing perimeter forest has been conserved where possible, with additional landscaped buffer provided.

Source Control

A comprehensive source control program will be implemented at the site, which includes regular pavement sweeping, catch basin cleaning, and enclosure and maintenance of all dumpsters. Further discussion of the site maintenance is included in the Stormwater Management Regulations Section 5. Details of the ongoing Stormwater Management Practices for the developed site are included in the Stormwater Management System Long Term Operation and Maintenance Plan provided in **Appendix E**.

Snow Management

Snow storage areas are shown on a map in the above mentioned Long Term Operation and Maintenance Plan and Spill Prevention Manual. Snow storage areas will be managed to prevent blockage of storm drain catch basins. Snow combined with sand and debris may block a storm drainage system, diminishing the infiltration capacity of the system and causing localized flooding.

Spill Prevention

Spill prevention is achieved with the proper storage and handling of hazardous materials. During construction, this is addressed in the Stormwater Pollution Prevention Plan (SWPPP) for Construction Activities to be prepared and implemented by the Site Contractor. The general response procedures for spills are outlined in the Long Term Operation and Maintenance Plan and Spill Prevention Manual, provided in Appendix E.

Catch Basins with Sumps and Oil/debris Traps and Trench Drains

Catch basins at the site are to be constructed with sumps (minimum 4-feet) and oil/debris traps to prevent the discharge of sediments and floating contaminants. The trench drains are to be constructed with a sump at the end of the drain.

Water Quality Units

There are two Contech® CDS Water Quality Units (or equivalent) proposed. These units efficiently remove total suspended solids (TSS) and free oil from the

stormwater run-off. The units prevent the re-suspension of settled material, and allow for safe and easy removal of collected material. TSS calculations for the units are provided in **Appendix D**.

Subsurface Infiltration System

Infiltration Basin INF-1 – The subsurface infiltration system consists of 132 Stormtech MC-3500 high capacity infiltration chambers. The design of the chambers includes a permeable bottom that allows for maximum exfiltration of the treated runoff from the system to the groundwater. The bottom of the infiltration basin is proposed to be at elevation 9.5 feet. Test pits were performed within the limits of the proposed system that indicate the existing soil to be loamy sand in texture with a 2.41 in/hr infiltration rate. A seasonal high water table at elevation 5.26 feet was determined using the onsite soil exploration in conjunction with an adjustment factor based on historical USGS groundwater readings in the vicinity of the Site. A mounding analysis is not required for this basin because greater than four feet of separation is provided between the bottom of the system and seasonal high groundwater.



4

Hydrologic/Hydraulic Analysis

Hydrologic Analysis

The rainfall-runoff response of the Site under existing and proposed conditions was evaluated for storm events with recurrence intervals of 2, 10, and 100-years. Rainfall volumes used for this analysis were based on the larger of the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm events for Dukes County, Massachusetts, and the NOAA Atlas-14 precipitation estimates for Edgartown, Massachusetts. The values used were 3.60, 4.90, and 7.22 inches, respectively. Runoff coefficients for the pre- and post-development conditions were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD.

Drainage areas used in the analyses were described in previous sections and shown on Figures 2 and 3. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology. Detailed printouts of the HydroCAD analyses are included in **Appendix I. Table 1** presents a summary of the existing and proposed conditions peak discharge rates.

Table 1 Peak Discharge Rates (cfs*)

Design Point	2-year	10-year	100-year
Design Point 1: Offsite North			
Existing	0.0	0.0	0.1
Proposed	0.0	0.0	0.1
Design Point 2: Offsite East			
Existing	0.0	0.1	0.1
Proposed	0.0	0.0	0.0

* Expressed in cubic feet per second

The results of the analysis indicate that there is no increase in peak discharge rates between the pre- and post-development conditions for the 2-year, 10-year, and 100-year storm events.

Hydraulic Analysis

The closed drainage system was designed for the 25-year storm event. Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method using StormCAD, a HEC-22 based program. Pipe sizing calculations are included in **Appendix F** of this report.



5

Stormwater Management Regulations

The purpose of the Stormwater Management Plan (the Plan) is to provide long-term protection of natural resources in and around the Site. This is achieved by implementing water quality and quantity control measures designed to decrease the amount of pollutants discharged from the Site, increase the quality of stormwater recharged on the Site, and control discharge rates.

The following sections describe the regulations pertinent to stormwater management and the specific components of the Plan to be implemented.

Stormwater Regulations and Permitting

The following stormwater related regulations and guidelines apply to the proposed site development:

- › Massachusetts State Stormwater Management Regulations and Performance Standards included in the Stormwater Handbook, (Department of Environmental Protection February 2008).
- › Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Stormwater Permit for Construction Activities disturbing greater than one acre (EPA, Federal Register, December 8, 1999 and amendments)

Compliance with these regulations is described in the following sections.

Stormwater Management Standards and Guidelines

The methods for compliance with the ten stormwater performance standards developed by the MA DEP are summarized below.

1. No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

All stormwater runoff from impervious surfaces within the limit of disturbance will be pretreated and recharged by a subsurface infiltration system. Additionally, portions of the existing parking lot and supermarket roof will be picked up and infiltrated within the proposed system. The remainder of the Site outside of the limit of disturbance appears to be in compliance with Standard 1 through the use of existing leaching galleys with no apparent outlets.

2. Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.

The post-development peak discharge rates do not exceed the pre-development rates for all design points for the 2, 10, and 100-year storm events.

3. Loss of annual recharge to ground water shall be eliminated or minimized using infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The proposed subsurface infiltration system is designed to recharge runoff from 100% of the impervious cover within the limit of disturbance, as well as a portion of existing pavement and supermarket roof; therefore, the required recharge volume is met using the subsurface infiltration system. The remainder of the Site outside of the limit of disturbance appears to be in compliance with Standard 3 through the use of existing leaching galleys with no apparent outlets.

4. Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:
 - Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;
 - Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and

- Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

TSS removal is achieved through a combination of deep sump hooded catch basins, Contech® CDS water quality units (or equivalent), and one subsurface infiltration basin. The treatment train achieves greater than 80% TSS removal.

5. For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

The project site meets the definition of a LUHPPL. TSS removal is achieved through a combination of deep sump hooded catch basins, Contech® CDS water quality units (or equivalent), and one subsurface infiltration basins. In areas where stormwater runoff is directed towards an infiltration basin a minimum of 44% TSS removal is achieved in pretreatment. In addition, source control and pollution prevention will be implemented as identified in the Long Term Stormwater Operation and Maintenance Plan and Spill Prevention Manual, provided in Appendix E.

6. Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply

Standard not applicable: The project does not discharge to any critical resources or areas listed above.

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

This project is not considered a redevelopment and has been designed to comply with the stormwater requirements.

8. A plan to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

*Recommended erosion and sedimentation control practices are included in **Appendix G** and will be finalized as part of the Notice of Intent process. A maintenance checklist recommended for evaluating erosion control BMPs is also included.*

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

*Recommended practices for operating and maintaining long term stormwater BMPs is included in **Appendix E**. A recommended checklist for maintenance inspections and follow up is also included.*

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

Sanitary sewer and storm drainage structures remaining from the existing development and within the limit of work will be removed or will be incorporated into updated sanitary sewer and separate stormwater sewer systems. The design plans submitted with this report have been designed so that the components included therein are in full compliance with current standards. No statement is made with regard to the drainage system in portions of the site not included in the redevelopment project area. The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges.

Federal NPDES Construction-Related General Stormwater Permits

The proposed project will result in the disturbance of more than one acre of land and thus requires the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) by the site contractor and owner in accordance with the Environmental Protection Agency's (EPA's) National Pollutant Discharge Elimination System (NPDES) General Permit Program for Stormwater Discharges from Construction Sites. The SWPPP is not included in this report. However, standard recommended components of the Stormwater Pollution Prevention Plan for

construction phases of the development to be prepared and implemented by the site contractor are described in **Appendix E and G**.