CITY OF PORTLAND, MAINE
PLANNING BOARD
STORMWATER MANAGEMENT REPORT

Prepared for

FH STUDIO
77 Woods Road
Portland, Maine

August 2018

STATE OF MAINE
DANIEL P. DIFFIN
11841
LICENSED
PROFESSIONAL ENGINEER
6/31/18

SME
SEVEE & MAHER ENGINEERS

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

4 Blanchard Road, P.O. Box 85A, Cumberland, ME 04021 • Tel 207.829.5016 • Fax 207.829.5692 • smemaine.com

TABLE OF CONTENTS

Section No.	Title	Page No.
1.0 INTRODUCTION		1
2.0 PROJECT DESCRIPTION		1
3.0 SITE WATERSHED		1
4.0 STORMWATER QUANTITY ANALYSIS		3
5.0 SUMMARY		4

LIST OF APPENDICES

APPENDIX A NRCS SOIL REPORT
APPENDIX B PRE-DEVELOPMENT HYDROCAD CALCULATIONS
APPENDIX C POST-DEVELOPMENT HYDROCAD CALCULATIONS
APPENDIX D POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN
APPENDIX E DRAINAGE FIGURES

LIST OF TABLES

Table No.	Title	Page No.
1	STORMWATER QUANTITY SUMMARY	4

CITY OF PORTLAND, MAINE
PLANNING BOARD
STORMWATER MANAGEMENT REPORT

1.0 INTRODUCTION

The following outlines the stormwater management design for the proposed building construction and associated site improvements at 77 Woods Road in Portland, Maine. The stormwater design prepared by Sevee & Maher Engineers, Inc. (SME) is based on the water quality and quantity objectives identified in the City Ordinances.

2.0 PROJECT DESCRIPTION

The property owner proposes to construct a new 1,040-square-foot building on the existing lot with a 10-foot wide access drive for vehicle and pedestrian access. The site is currently partially developed with a 1,675-square-foot residence at the end of Woods Road. The project will include the building and deck, 2,900 square feet of gravel access drive, and improvements to the existing septic field. The project will result in a 6,800-square-foot increase in developed area and an increase in impervious area of 3,940 square feet. With an increase of impervious area greater than 1,000 square feet, the project is required by the City Ordinance to meet the basic, general, and flooding standards of Maine Department of Environmental Protection's (MEDEP) Chapter 500.

3.0 SITE WATERSHED

On-site soils were identified using the Natural Resources Conservation Service (NRCS) soil information for Cumberland County, Maine. A copy of the custom Soil Resource Report is included in Appendix A. The soil within the area of work consists of Lyman-Abram Complex (HsE) which is classified as "somewhat excessively drained" and hydrologic soil group (HSG) D soils.

In existing conditions, the west portion of the property drains to the northwesterly to a wetland area near the end of Woods Road and then to the abutting property. The rest of the site

generally drains to the shore and into the Ocean. For the purposes of this analysis, the low point in the wetland along Woods Road was identified as Analysis Point (AP) 1, and the shoreline was identified as Analysis Point (AP) 2.

In developed conditions, the flow on the west portion of the property will continue to drain to the wetland area near the Woods Road. The subcatchment will get slightly larger to capture the north portion of the access drive and the southwest portion of the new building. The runoff from these areas will drain through a new roadside ditch north of the drive.

The subcatchment that drains to the shoreline will continue to drain similar to existing conditions. The drainage area will get slightly smaller as a result of the grading in front of the new building.

Pre-development and post-development stormwater management plans identify the on-site drainage patterns before and after development (See Figures D-100 and D-101) and are included in Appendix E of this report. Appendices B and C provide pre- and post-development calculations using TR-20 methodologies prepared with the HydroCAD computer stormwater modeling system by Applied Microcomputer Systems of Chocorua, New Hampshire.

4.0 STORMWATER QUALITY ANALYSIS

Stormwater quality treatment for the sloped, non-industrial rooftop will not be required per the exceptions to the General Standards under Section 4.C.5.(f) of Chapter 500. Thermal impacts from the 1,040-square-foot building will be mitigated through overland flow on vegetation along the bank prior to draining to Casco Bay. Channel Protection is not required as the drainage from the rooftop will drain to Casco Bay directly.

The remaining impervious area to be treated includes the proposed 10-foot-wide gravel access drive that runs from the existing driveway to the new building. The drive will be used primarily for access of construction vehicles during the building construction. Originally, the applicant considered removing the majority of this drive to leave a narrower walking path. This would have minimized creation of new impervious area. The project was reviewed with the City Fire

Department, however, and it was determined that emergency vehicle access would be required up to the building. The Applicant proposes the 10' wide access drive with turnaround areas near the building to accommodate these vehicles. In total, the drive will result in 2,900 square feet of impervious area.

To provide stormwater treatment for the access drive, the proposed use was first evaluated. There will be little to no vehicle traffic on this drive, with the exception for maintenance on or around the building, or for minimal vehicle access. The drive will primarily be used for pedestrian access to the building for the current property owners. Given the minor nature of the use, water quality treatment is proposed by overlaying the driveway with Superhumus mulch. The mulch will absorb most of the rainfall on the driveway and evaporate after the storm subsides. This method of stormwater management avoids additional land clearing and earth disturbance required to construct a treatment pond at the site, while providing the appropriate amount of stormwater management.

This same treatment techniques as reviewed and approved for projects completed by SME at the XNG Compressor Station in Eliot Maine, where a 12-foot-wide maintenance road was covered with Superhumus.

The exemption from Chapter 500 for the impervious roof area and treating all of the proposed gravel area with 4 inches of Superhumus will result in treatment of an equivalent of 100% of the new impervious area for the project.

5.0 STORMWATER QUANTITY ANALYSIS

Stormwater quantity is managed to the maximum extent practicable through minimizing the amount of impervious area on the site and covering the gravel road with a Superhumus material made up of bark mulch and sandy material intended to absorb stormwater runoff. The gravel drives being covered with Superhumus were modeled with a Curve Number of 80, consistent with a lawn area on HSG Type D soils. Table 1 demonstrates peak flow rates from the subwatershed areas at the two analysis points shown on Figures D-100 and D-101.

TABLE 1

STORMWATER QUANTITY SUMMARY

AP	2-yr Storm		10-yr Storm		25-yr Storm	
	Pre- (cfs)	Post- (cfs)	Pre- (cfs)	Post- (cfs)	Pre- (cfs)	Post- (cfs)
1	1.05	1.21	2.01	2.27	2.81	3.16
2	1.57	1.60	3.15	3.20	4.50	4.55

The post-development flows have been analyzed for the 2-year, 10-year and 25-year storms using HydroCAD (see Appendices B and C). The peak flows at Analysis Point 1 are estimated to increase by 0.16 cfs in the 2-year storm, 0.26 cfs in the 10-year storm, and 0.35 cfs in the 25-year storm. The increase in flows are a result of the minor increase in the impervious area and watershed area due to the revised grading. Analysis Point 1 is a flat wetland area near the existing drive that is adequately sized to accommodate the insignificant increases in flows resulting from the proposed construction.

The peak flows at Analysis Point 2 will not increase significantly and discharges directly to Casco Bay.

6.0 MAINTENANCE AND INSPECTION

The owner or operator of a BMP shall hire a qualified post-construction stormwater inspector to at least annually, inspect the BMPs, including but not limited to any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all municipal and state inspection, cleaning and maintenance requirements of the approved post-construction stormwater management plan.

Additional details on the specific maintenance requirements for this project is in the Post-Construction Stormwater Management Plan in Appendix D.

7.0 SUMMARY

The stormwater management for the FH Studio project will have no adverse impact to the downstream drainage or abutting properties, and the required treatment is provided for the net increase in impervious area.

APPENDIX A

NRCS SOIL REPORT

SME
SEVEE & MAHER
ENGINEERS

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Cumberland County and Part of Oxford County, Maine

August 14, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface 2
Soil Map 5
Soil Map 6
Legend 7
Map Unit Legend 9
Map Unit Descriptions 9
Cumberland County and Part of Oxford County, Maine 11
HsB—Lyman-Abram complex, 0 to 8 percent slopes, very rocky 11
HsC—Lyman-Abram complex, 8 to 15 percent slopes, very rocky 12
HsE—Lyman-Abram complex, 15 to 35 percent slopes, very rocky 14
W—Water 16

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

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 1:24,000.

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: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 13, Sep 11, 2017

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

Date(s) aerial images were photographed: Dec 31, 2009—Oct 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

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
HsB	Lyman-Abram complex, 0 to 8 percent slopes, very rocky	2.1	16.0%
HsC	Lyman-Abram complex, 8 to 15 percent slopes, very rocky	0.1	0.8%
HsE	Lyman-Abram complex, 15 to 35 percent slopes, very rocky	6.1	45.7%
W	Water	5.0	37.5%
Totals for Area of Interest		**13.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

HsB—Lyman-Abram complex, 0 to 8 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2x1d0
Elevation: 0 to 520 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Lyman and similar soils: 50 percent
Abram and similar soils: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loam
E - 3 to 5 inches: fine sandy loam
Bhs - 5 to 7 inches: loam
Bs1 - 7 to 11 inches: loam
Bs2 - 11 to 18 inches: channery loam
R - 18 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 11 to 24 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Abram

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy subglacial till

Typical profile

Oa - 0 to 2 inches: highly decomposed plant material
E - 2 to 3 inches: loam
Bs - 3 to 6 inches: loam
R - 6 to 79 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 3 to 13 inches to lithic bedrock
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

HsC—Lyman-Abram complex, 8 to 15 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2x1d1
Elevation: 0 to 520 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Lyman and similar soils: 45 percent
Abram and similar soils: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Crest, nose slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loam
E - 3 to 5 inches: fine sandy loam
Bhs - 5 to 7 inches: loam
Bs1 - 7 to 11 inches: loam
Bs2 - 11 to 18 inches: channery loam
R - 18 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 11 to 24 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Abram

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy subglacial till

Typical profile

Oa - 0 to 2 inches: highly decomposed plant material
E - 2 to 3 inches: loam
Bs - 3 to 6 inches: loam
R - 6 to 79 inches: bedrock

Properties and qualities

Slope: 8 to 15 percent

Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 3 to 13 inches to lithic bedrock
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

HsE—Lyman-Abram complex, 15 to 35 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2x1d2
Elevation: 0 to 520 feet
Mean annual precipitation: 36 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Lyman and similar soils: 45 percent
Abram and similar soils: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Lyman

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, nose slope, side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loam
E - 3 to 5 inches: fine sandy loam
Bhs - 5 to 7 inches: loam

Bs1 - 7 to 11 inches: loam
Bs2 - 11 to 18 inches: channery loam
R - 18 to 79 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 11 to 24 inches to lithic bedrock
Natural drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Abram

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Nose slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy subglacial till

Typical profile

Oa - 0 to 2 inches: highly decomposed plant material
E - 2 to 3 inches: loam
Bs - 3 to 6 inches: loam
R - 6 to 79 inches: bedrock

Properties and qualities

Slope: 15 to 35 percent
Percent of area covered with surface fragments: 1.5 percent
Depth to restrictive feature: 3 to 13 inches to lithic bedrock
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

W—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Water

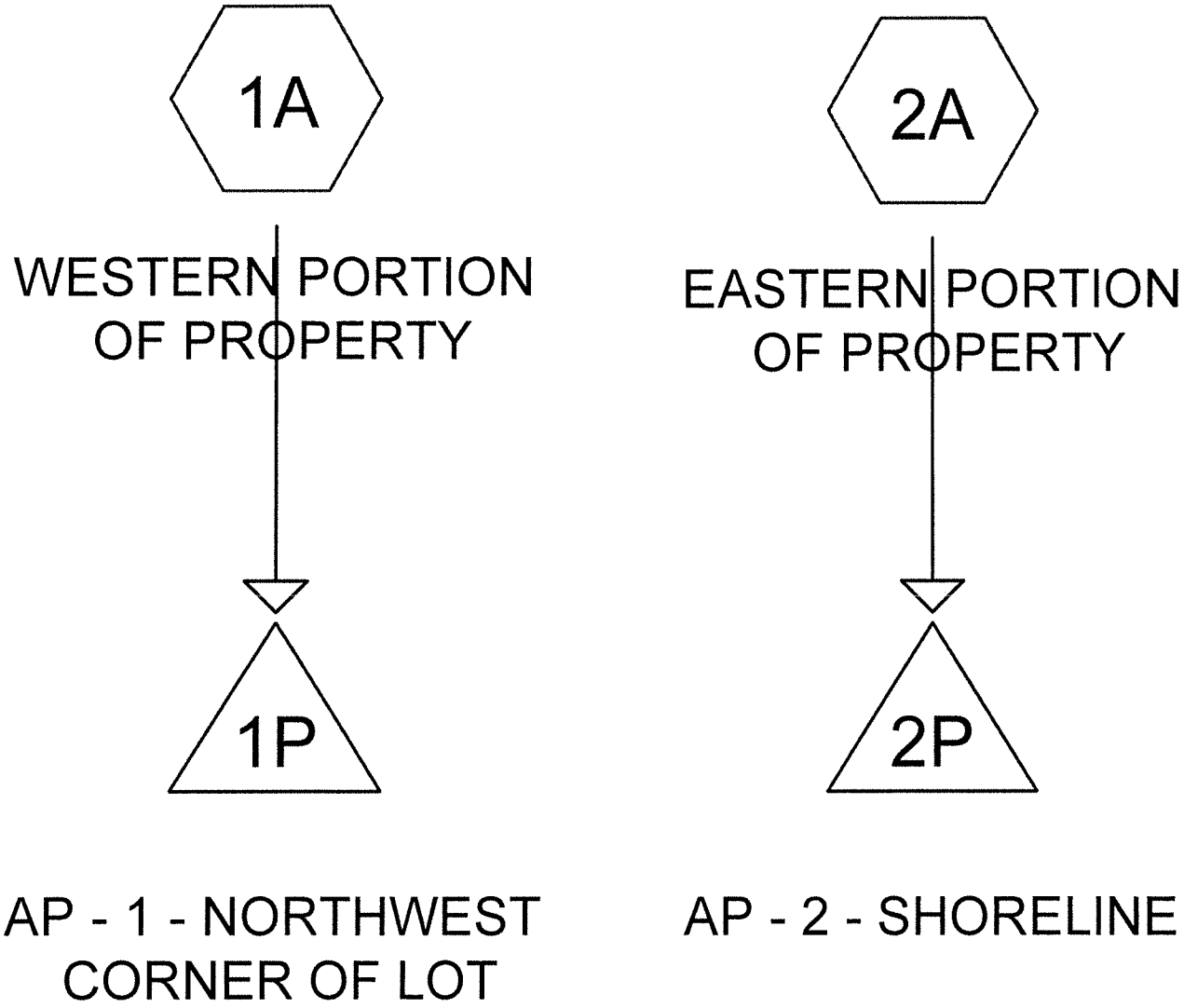
Setting

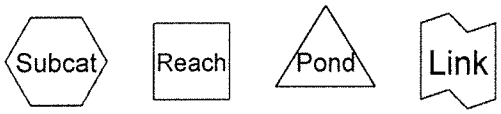
Landform: Lakes

APPENDIX B

PRE-DEVELOPMENT HYDROCAD CALCULATIONS

SME
SEVEE & MAHER
ENGINEERS





Routing Diagram for Pre-development Stormwater Calculations
Prepared by Sevee Maher Engineers, Inc., Printed 8/27/2018
HydroCAD® 10.00-22 s/n M05840 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment 1A: WESTERN PORTION OF PROPERTY

Runoff = 1.05 cfs @ 12.01 hrs, Volume= 0.054 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG D
8,561	78	Meadow, non-grazed, HSG D
10,681	77	Woods, Good, HSG D
21,472	80	Weighted Average
19,242		89.61% Pervious Area
2,230		10.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
3.7	40	0.1000	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
1.9	77	0.0190	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	147	Total			

Summary for Subcatchment 2A: EASTERN PORTION OF PROPERTY

Runoff = 1.57 cfs @ 12.05 hrs, Volume= 0.095 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
0	98	Paved parking, HSG D
24,178	78	Meadow, non-grazed, HSG D
17,362	77	Woods, Good, HSG D
41,540	78	Weighted Average
41,540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	100	0.0870	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	108	0.1850	2.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	208	Total			

Summary for Pond 1P: AP - 1 - NORTHWEST CORNER OF LOT

Inflow Area = 0.493 ac, 10.39% Impervious, Inflow Depth = 1.33" for 2-YR event
Inflow = 1.05 cfs @ 12.01 hrs, Volume= 0.054 af
Primary = 1.05 cfs @ 12.01 hrs, Volume= 0.054 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: AP - 2 - SHORELINE

Inflow Area =	0.954 ac,	0.00% Impervious,	Inflow Depth =	1.20"	for 2-YR event
Inflow =	1.57 cfs @	12.05 hrs,	Volume=	0.095 af	
Primary =	1.57 cfs @	12.05 hrs,	Volume=	0.095 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1A: WESTERN PORTION OF PROPERTY

Runoff = 2.01 cfs @ 12.01 hrs, Volume= 0.105 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG D
8,561	78	Meadow, non-grazed, HSG D
10,681	77	Woods, Good, HSG D
21,472	80	Weighted Average
19,242		89.61% Pervious Area
2,230		10.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
3.7	40	0.1000	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
1.9	77	0.0190	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	147	Total			

Summary for Subcatchment 2A: EASTERN PORTION OF PROPERTY

Runoff = 3.15 cfs @ 12.05 hrs, Volume= 0.189 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
0	98	Paved parking, HSG D
24,178	78	Meadow, non-grazed, HSG D
17,362	77	Woods, Good, HSG D
41,540	78	Weighted Average
41,540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	100	0.0870	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	108	0.1850	2.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	208	Total			

Summary for Pond 1P: AP - 1 - NORTHWEST CORNER OF LOT

Inflow Area =	0.493 ac,	10.39% Impervious,	Inflow Depth =	2.55"	for 10-YR event
Inflow =	2.01 cfs @	12.01 hrs,	Volume=	0.105 af	
Primary =	2.01 cfs @	12.01 hrs,	Volume=	0.105 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: AP - 2 - SHORELINE

Inflow Area =	0.954 ac,	0.00% Impervious,	Inflow Depth =	2.38"	for 10-YR event
Inflow =	3.15 cfs @	12.05 hrs,	Volume=	0.189 af	
Primary =	3.15 cfs @	12.05 hrs,	Volume=	0.189 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1A: WESTERN PORTION OF PROPERTY

Runoff = 2.81 cfs @ 12.00 hrs, Volume= 0.148 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG D
8,561	78	Meadow, non-grazed, HSG D
10,681	77	Woods, Good, HSG D
21,472	80	Weighted Average
19,242		89.61% Pervious Area
2,230		10.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
3.7	40	0.1000	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
1.9	77	0.0190	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	147	Total			

Summary for Subcatchment 2A: EASTERN PORTION OF PROPERTY

Runoff = 4.50 cfs @ 12.05 hrs, Volume= 0.270 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
0	98	Paved parking, HSG D
24,178	78	Meadow, non-grazed, HSG D
17,362	77	Woods, Good, HSG D
41,540	78	Weighted Average
41,540		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.1	100	0.0870	0.14		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.8	108	0.1850	2.15		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
12.9	208	Total			

Summary for Pond 1P: AP - 1 - NORTHWEST CORNER OF LOT

Inflow Area =	0.493 ac,	10.39% Impervious,	Inflow Depth =	3.60"	for 25-YR event
Inflow =	2.81 cfs @	12.00 hrs, Volume=	0.148 af		
Primary =	2.81 cfs @	12.00 hrs, Volume=	0.148 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: AP - 2 - SHORELINE

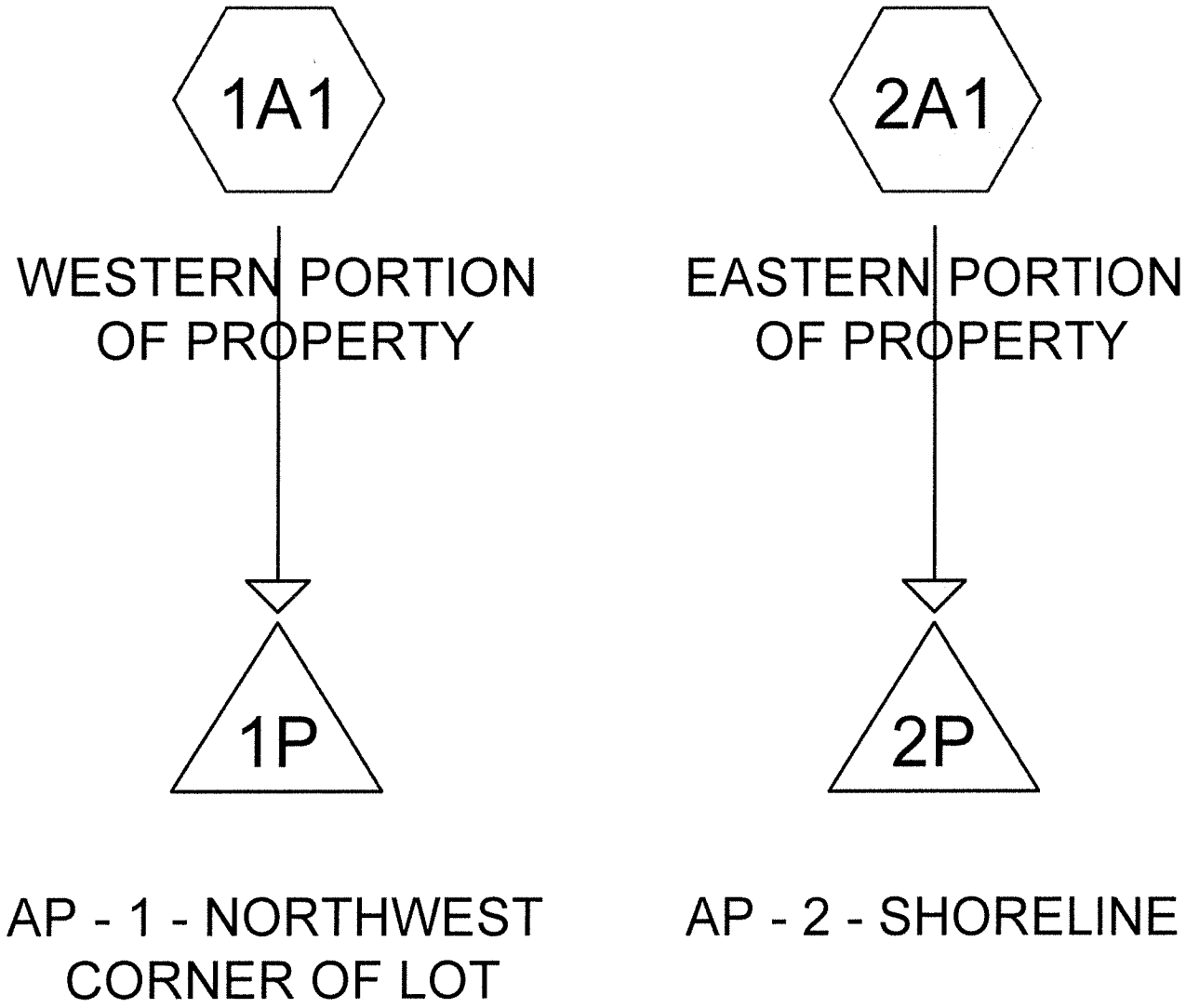
Inflow Area =	0.954 ac,	0.00% Impervious,	Inflow Depth =	3.40"	for 25-YR event
Inflow =	4.50 cfs @	12.05 hrs, Volume=	0.270 af		
Primary =	4.50 cfs @	12.05 hrs, Volume=	0.270 af,	Atten= 0%,	Lag= 0.0 min

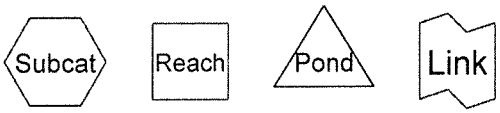
Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

APPENDIX C

POST-DEVELOPMENT HYDROCAD CALCULATIONS

SME
SEVEE & MAHER
ENGINEERS





Routing Diagram for POST-development Stormwater Calculations
Prepared by Sevee Maher Engineers, Inc., Printed 8/27/2018
HydroCAD® 10.00-22 s/n M05840 © 2018 HydroCAD Software Solutions LLC

Summary for Subcatchment 1A1: WESTERN PORTION OF PROPERTY

Runoff = 1.15 cfs @ 12.01 hrs, Volume= 0.060 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG D
2,337	80	>75% Grass cover, Good, HSG D
278	98	Roofs, HSG D
7,934	78	Meadow, non-grazed, HSG D
10,780	77	Woods, Good, HSG D
23,559	80	Weighted Average
21,051		89.35% Pervious Area
2,508		10.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
3.7	40	0.1000	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
1.9	77	0.0190	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	147	Total			

Summary for Subcatchment 2A1: EASTERN PORTION OF PROPERTY

Runoff = 1.60 cfs @ 12.03 hrs, Volume= 0.091 af, Depth= 1.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-YR Rainfall=3.10"

Area (sf)	CN	Description
567	80	>75% Grass cover, Good, HSG D
761	98	Roofs, HSG C
20,857	78	Meadow, non-grazed, HSG D
17,270	77	Woods, Good, HSG D
39,455	78	Weighted Average
38,694		98.07% Pervious Area
761		1.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1290	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.3	34	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	63	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	197	Total			

Summary for Pond 1P: AP - 1 - NORTHWEST CORNER OF LOT

Inflow Area =	0.541 ac,	10.65% Impervious,	Inflow Depth =	1.33"	for 2-YR event
Inflow =	1.15 cfs @	12.01 hrs,	Volume=	0.060 af	
Primary =	1.15 cfs @	12.01 hrs,	Volume=	0.060 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: AP - 2 - SHORELINE

Inflow Area =	0.906 ac,	1.93% Impervious,	Inflow Depth =	1.20"	for 2-YR event
Inflow =	1.60 cfs @	12.03 hrs, Volume=	0.091 af		
Primary =	1.60 cfs @	12.03 hrs, Volume=	0.091 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1A1: WESTERN PORTION OF PROPERTY

Runoff = 2.20 cfs @ 12.01 hrs, Volume= 0.115 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG D
2,337	80	>75% Grass cover, Good, HSG D
278	98	Roofs, HSG D
7,934	78	Meadow, non-grazed, HSG D
10,780	77	Woods, Good, HSG D
23,559	80	Weighted Average
21,051		89.35% Pervious Area
2,508		10.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
3.7	40	0.1000	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
1.9	77	0.0190	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	147	Total			

Summary for Subcatchment 2A1: EASTERN PORTION OF PROPERTY

Runoff = 3.20 cfs @ 12.03 hrs, Volume= 0.179 af, Depth= 2.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-YR Rainfall=4.60"

Area (sf)	CN	Description
567	80	>75% Grass cover, Good, HSG D
761	98	Roofs, HSG C
20,857	78	Meadow, non-grazed, HSG D
17,270	77	Woods, Good, HSG D
39,455	78	Weighted Average
38,694		98.07% Pervious Area
761		1.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1290	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.3	34	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	63	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	197	Total			

Summary for Pond 1P: AP - 1 - NORTHWEST CORNER OF LOT

Inflow Area =	0.541 ac,	10.65% Impervious,	Inflow Depth =	2.55"	for 10-YR event
Inflow =	2.20 cfs @	12.01 hrs, Volume=	0.115 af		
Primary =	2.20 cfs @	12.01 hrs, Volume=	0.115 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: AP - 2 - SHORELINE

Inflow Area =	0.906 ac,	1.93% Impervious,	Inflow Depth =	2.38"	for 10-YR event
Inflow =	3.20 cfs @	12.03 hrs, Volume=	0.179 af		
Primary =	3.20 cfs @	12.03 hrs, Volume=	0.179 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 1A1: WESTERN PORTION OF PROPERTY

Runoff = 3.08 cfs @ 12.00 hrs, Volume= 0.162 af, Depth= 3.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
2,230	98	Paved parking, HSG D
2,337	80	>75% Grass cover, Good, HSG D
278	98	Roofs, HSG D
7,934	78	Meadow, non-grazed, HSG D
10,780	77	Woods, Good, HSG D
23,559	80	Weighted Average
21,051		89.35% Pervious Area
2,508		10.65% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	30	0.2100	0.15		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
3.7	40	0.1000	0.18		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.10"
1.9	77	0.0190	0.69		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
8.9	147	Total			

Summary for Subcatchment 2A1: EASTERN PORTION OF PROPERTY

Runoff = 4.55 cfs @ 12.03 hrs, Volume= 0.257 af, Depth= 3.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
567	80	>75% Grass cover, Good, HSG D
761	98	Roofs, HSG C
20,857	78	Meadow, non-grazed, HSG D
17,270	77	Woods, Good, HSG D
39,455	78	Weighted Average
38,694		98.07% Pervious Area
761		1.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.1290	0.16		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.10"
0.3	34	0.1290	1.80		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.3	63	0.3300	4.02		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.0	197	Total			

Summary for Pond 1P: AP - 1 - NORTHWEST CORNER OF LOT

Inflow Area =	0.541 ac,	10.65% Impervious,	Inflow Depth =	3.60"	for 25-YR event
Inflow =	3.08 cfs @	12.00 hrs, Volume=	0.162 af		
Primary =	3.08 cfs @	12.00 hrs, Volume=	0.162 af,	Atten= 0%,	Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

Summary for Pond 2P: AP - 2 - SHORELINE

Inflow Area =	0.906 ac,	1.93% Impervious,	Inflow Depth =	3.40"	for 25-YR event
Inflow =	4.55 cfs @	12.03 hrs,	Volume=	0.257 af	
Primary =	4.55 cfs @	12.03 hrs,	Volume=	0.257 af,	Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs

APPENDIX D

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN

SME
SEVEE & MAHER
ENGINEERS

CITY OF PORTLAND, MAINE
PLANNING BOARD
POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN

Prepared for

FH STUDIO
77 Woods Road
Portland, Maine

August 2018

STATE OF MAINE
DANIEL P. DIFFIN
11841
LICENSED
PROFESSIONAL ENGINEER

SME
SEVEE & MAHER ENGINEERS

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

4 Blanchard Road, P.O. Box 85A, Cumberland, ME 04021 • Tel 207.829.5016 • Fax 207.829.5692 • smemaine.com

TABLE OF CONTENTS

Section No. Title Page No.

1.0 SITE DESCRIPTION 1

2.0 CONTACTS 1

3.0 POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN OVERVIEW AND OBJECTIVES 2

3.1 Site Management Practices 2
3.2 Inspections 3
3.3 Routine Maintenance and Corrective Actions 3
3.4 Annual Report 5

LIST OF TABLES

Table No. Title Page No.

1 SITE INSPECTION SCHEDULE 3

CITY OF PORTLAND, MAINE
PLANNING BOARD
POST-CONSTRUCTION STORMWATER
MANAGEMENT PLAN

1.0 SITE DESCRIPTION

The property owner proposes to construct a new 1,040-square-foot building on the existing lot with a 10-foot-wide access drive for vehicle and pedestrian access. The site is currently fully developed with a 1,675-square-foot residence at the end of Woods Road. The project will include the building and deck, 2,900 square feet of gravel access drive, and improvements to the existing septic field. The project will result in a 6,800-square-foot increase in developed area and an increase in impervious area of 3,940 square feet.

2.0 CONTACTS

Facility:	FH STUDIO 77 Woods Road Portland, Maine
Owner Representative:	TBD Telephone: DBD
Consultant/Designer:	Sevee & Maher Engineers, Inc. 4 Blanchard Road Cumberland, Maine 04021 Telephone: 207-829-5016 Daniel P. Diffin, P.E. dpd@smemaine.com

3.0 POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN OVERVIEW AND OBJECTIVES

The Post-Construction Stormwater Management Plan (PCSWMP) is an important component of the overall stormwater management system for the site. PCSWMP addresses various maintenance activities that should occur after construction and site stabilization. Proper implementation of the PCSWMP can minimize pollutant generation and transport and maintain the stormwater treatment system to ensure proper operation. This PCSWMP includes three primary components:

1. Site Management Practices
2. Inspections
3. Routine Maintenance and Corrective Actions

3.1 Site Management Practices

Site management practices are aimed at reducing pollutants by minimizing use of certain materials, using alternative materials, or removing pollutants prior to discharge to the stormwater treatment system. These practices shall include:

a. Use slow release sulfur or plastic coated ureaform fertilizers (e.g., Nutralene).
b. Do not fertilize vegetated swales once vegetation is established.
c. Minimize use of pesticides by using a sound integrated pest management (IPM) approach to monitor and control the actual pests present.
d. Collect and remove autumn leaves to minimize transport to the stormwater treatment system.
e. Minimize use of de-icing materials and sand.
f. Routine sweeping of parking areas and driveways.
g. Fertilizers, pesticides and other hazardous materials should be stored in enclosed areas to avoid exposure to precipitation.
h. Material handling should be conducted to minimize risk of spillage and release to the stormwater treatment system.

3.2 Inspections

A series of routine inspections by the Owner or their agent shall be completed to allow for the early identification of potential problems, and to guide routine maintenance activities. Inspections shall be carried out in accordance with the Site Inspection Schedule (Table 1). Dates and observations shall be recorded for each inspection on the attached 'Inspection Log'.

In addition to the routine inspections, an inspection by a qualified post-construction stormwater inspector to inspect the BMPs is required on a minimum annual basis.

TABLE 1

SITE INSPECTION SCHEDULE
FH STUDIO
77 WOODS ROAD

	Spring	Fall or Yearly	After a Major Storm	Every 2-5 Years
Vegetated Areas				
Inspect all slopes and embankments	X	X	X	
Replant bare areas or areas with sparse growth	X	X	X	
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	X	X	X	
Driveways and Parking Surfaces				
Clear accumulated winter sand in parking lots and along roadways	X			
Sweep pavement to remove sediment	X			
Rake and replace Superhumus in areas where necessary	X	X	X	

3.3 Routine Maintenance and Corrective Actions

Routine maintenance activities are designed to ensure proper function of the stormwater management system and minimize pollutant transport from the site. Routine maintenance activities must be completed according to the schedule (Table 1) provided in this plan. This schedule is the minimum amount of maintenance required, and maintenance that is more frequent may be needed when indicated by the inspections. Corrective actions (supplemental maintenance activities or repairs) should be completed as soon as possible, but no more than seven days, after the inspection identifying the problem. Each maintenance activity will be

recorded on the attached 'Maintenance Log'. Records of the deficiencies and corrective actions shall be included in the annual report.

During construction, the Sitework Contractor shall be responsible for cleaning and maintaining stormwater components on the schedule outlined in Table 1.

Following completion of construction, the Owner will be responsible for cleaning and maintaining stormwater components on the schedule outlined in Table 1.

Place removed sediments in an area of low erosion potential, either on-site or off-site, and seed with erosion control seed mix.

The following describes specific stormwater facilities maintenance requirements and minimum schedule of inspection and maintenance.

1. Open swales and ditches need to be inspected in the spring and fall, or after a major rainfall event, to assure that debris or sediments do not reduce the effectiveness of the system. Debris needs to be removed at that time. Sign of erosion or blockage shall be immediately repaired to assure a vigorous growth of vegetation for the stability of the structure and proper functioning. Swales that show newly formed channels or gullies will be immediately repaired by reseeding/sodding of bare spots, removal of trash, leaves and/or accumulated sediments, and the control of woody or other undesirable vegetation.

2. Vegetated ditches should be mowed at least once during the growing season. Larger brush or trees must not be allowed to become established in the channel. Any areas where the vegetation fails will be subject to erosion and should be repaired and revegetated.

3. If sediment in culverts or piped drainage systems exceeds 20 percent of the diameter of the pipe, it should be removed. This may be accomplished by hydraulic flushing or other mechanical means; however, care should be taken to

not flush the sediments into the infiltration basin as it will reduce the pond's capacity and hasten the time when it must be cleaned. Storm pipes should be inspected on an annual basis.

4. Paved surfaces shall be swept or vacuumed at least annually in the spring to remove winter sand and periodically during the year on an as-needed basis to minimize the transportation of sediment during rainfall events.

5. The Superhumus mulch driveway surface shall be inspected quarterly. Care should be taken to avoid causing ruts or unstable areas. The Superhumus mulch should be repaired or replaced immediately if erosion is identified.

3.4 Annual Report

The Owner or a qualified post-construction stormwater inspector shall provide a completed and signed certification to the department of public services (DPS) in a form provided by DPS certifying that the person has inspected the BMPs and that they are adequately maintained and functioning as required by this Plan, or that they require maintenance or repair, including the record of the deficiencies and corrective actions taken. The Owner will be required to pay a filing fee established by the DPS.

The maintenance needs for most vegetative and stabilization measures may be found in the Maine Erosion and Sediment Control BMPs manual as published in October 2016 (or latest version) and/or the Maine Stormwater Best Management Practices Manual.

FH STUDIO
77 WOODS ROAD

INSPECTION LOG

Date	Device/Area Inspected	Inspected By	Observations, Deficiencies & Recommended Corrective Actions

FH STUDIOS
77 WOODS ROAD

MAINTENANCE LOG

Date	Device or Area Maintained/ Repaired	Maintenance and/or Repair Completed By	Maintenance Completed/Corrective Actions Taken

APPENDIX E

DRAINAGE FIGURES

SME
SEVEE & MAHER
ENGINEERS

STORMWATER MANAGEMENT LEGEND

1	SUBCATCHMENT DESIGNATION
	SUBCATCHMENT BOUNDARY
A B C	TIME OF CONCENTRATION SEGMENT DESIGNATION TIME OF CONCENTRATION PATH
	HYDROLOGIC SOIL GROUP BOUNDARY
D	HYDROLOGIC SOIL GROUP DESIGNATION
Sht L=50' S=0.005	TIME OF CONCENTRATION TYPE, LENGTH, AND SLOPE
Sht	SHEET FLOW
Shc	SHALLOW CONCENTRATED FLOW
Cf	CHANNEL FLOW
	DRAINAGE REACH
R4	REACH DESIGNATION (HYDROCAD)
P9	POND/STRUCTURE DESIGNATION (HYDROCAD)
tc 1	TIME OF CONCENTRATION WITH SUBCATCHMENT DESIGNATION

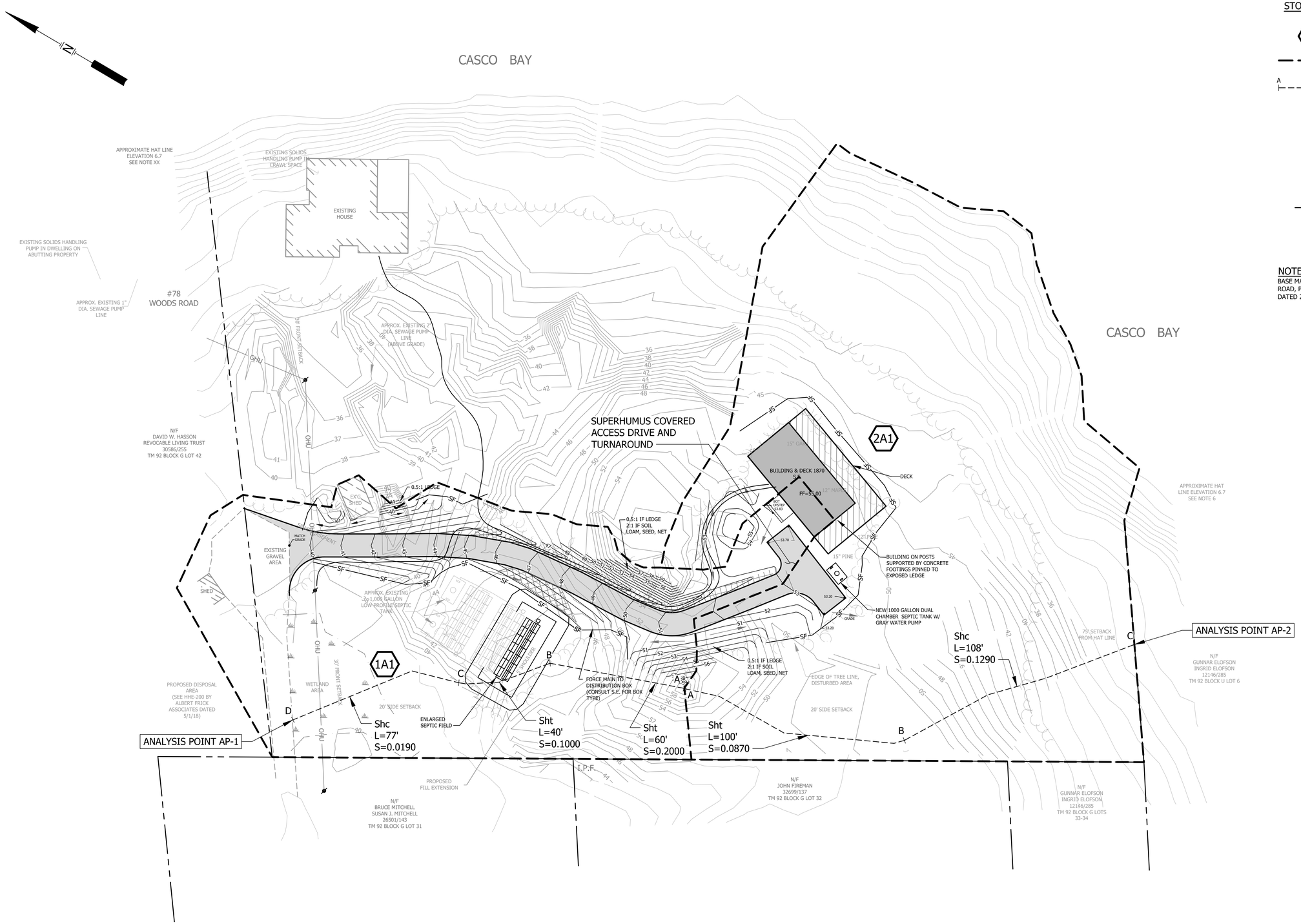
NOTE:
BASE MAP DERIVED FROM PLAN ENTITLED "SITE PLAN, C1.2, FH STUDIO, 77 WOODS ROAD, PEAKS ISLAND, MAINE" BY RACHEL CONLY DESIGN LLC OF PEAKS ISLAND, MAINE, DATED 2018.07.23.

10 0 20 40 FEET

FIGURE D-100
STORMWATER MANAGEMENT PLAN
PRE-DEVELOPED CONDITIONS

SME
SEVEE & MAHER ENGINEERS
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE
4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com

DWG: BASE LMN: SMP-E CTB: SME-STD REV: 8/28/2018



STORMWATER MANAGEMENT LEGEND

2	SUBCATCHMENT DESIGNATION
	SUBCATCHMENT BOUNDARY
A B C	TIME OF CONCENTRATION SEGMENT DESIGNATION TIME OF CONCENTRATION PATH
	HYDROLOGIC SOIL GROUP BOUNDARY
	HYDROLOGIC SOIL GROUP DESIGNATION
Sht L=100' S=0.035	TIME OF CONCENTRATION TYPE, LENGTH AND SLOPE
Sht	SHEET FLOW
Shc	SHALLOW CONCENTRATED FLOW
Cf	CHANNEL FLOW
	DRAINAGE REACH
R5	REACH DESIGNATION (HYDROCAD)
P44	POND/STRUCTURE DESIGNATION (HYDROCAD)
tc 2	TIME OF CONCENTRATION WITH SUBCATCHMENT DESIGNATION

NOTE:

BASE MAP DERIVED FROM PLAN ENTITLED "SITE PLAN, C1.2, FH STUDIO, 77 WOODS ROAD, PEAKS ISLAND, MAINE" BY RACHEL CONLY DESIGN LLC OF PEAKS ISLAND, MAINE, DATED 2018.07.23.

10 0 20 40 FEET

FIGURE D-101
STORMWATER MANAGEMENT PLAN
POST DEVELOPMENT CONDITIONS

SME
SEVEE & MAHER ENGINEERS

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

4 Blanchard Road, PO Box 85A, Cumberland, Maine 04021
Phone 207.829.5016 • Fax 207.829.5692 • smemaine.com

DWG: BASE LMN: SMP-P CTB: SME-STD REV: 8/28/2018