CITY OF PORTLAND, MAINE
PLANNING BOARD
LEVEL III SITE PLAN REVIEW APPLICATION

Prepared for

LEGACY 18 DEVELOPMENT INC.
4-UNIT CONDO BUILDING

5 & 9 Romasco Lane
Portland, Maine

January 2016

SME
Sevee & Maher Engineers, Inc.

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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

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PROJECT DESCRIPTION

Legacy 18 Development, Inc. (Owners) propose to construct a 1,955-square-foot apartment building on a 3,500 square foot parcel located at 5 and 9 Romasco Lane in Portland, Maine as shown on Figure 1 – Site Location Map included in Appendix A. The building will be a four-story, four-unit condo building with dedicated on-site parking in the garage located on the first floor. The property is located within the Residential 6 (R6) Zoning District and will comply with the City's vision of multifamily dwellings at a high density within this area.

The building will include; a three car garage on the first floor, two one-bedroom units on the second floor and two two-bedroom units on the third and fourth floors. The building design also includes four private roof decks for access by each unit.

The property is currently fully disturbed with an 880-square-foot paved parking area along the street frontage and an overgrown lawn area to the rear of the property. There was a 650 square-foot building removed in July of 2015. The proposed building, paved vehicle maneuvering area, walks and patios will not result in an increase in developed area on the property, but will increase the on-site impervious area to approximately 2,100 square feet, an increase of 600 square feet.

The number of dwelling units proposed requires a Level III Site Plan Development Review permit through the City. The following demonstrates the project's compliance with the applicable City of Portland Land Use Ordinance.

FINAL PLAN – LEVEL III SITE PLAN CHECKLIST REQUIREMENTS

This application package has been prepared in accordance with the City of Portland Land Use Ordinance and the Level III Site Plan Development Review Application. To address the submission requirements, the Applicant has provided the following:

Right, Title and Interest – See copies of Deed included in Appendix B.

State and/or Federal Permits – Not required for this project.

Evidence of Financial Capacity – See letter of financing provided in Appendix C.

Evidence of Technical Capacity – The Owners have hired qualified professionals to assist in the design, bidding and construction administration for this project as detailed on the application form.

City of Portland GIS Map – See copy of map included in Appendix D.

FEMA Map – See FEMA firmette in Appendix E

ARTICLE V. - SITE PLAN

The following demonstrate the project's compliance with Section 14-526 Site Plan Standards.

14-139 Dimensional Requirements

The site has been designed in accordance with all the dimensional requirements in section 14-139 of the City of Portland Code of Ordinances. The two lots combine to make one 3,500 square-foot lot. The proposed building will have a 1,955 square-foot footprint and the units range from 947 to 1,645 square feet. The side yard set backs are shown on drawing C-102 and total more than 10 feet. The proposed front yard is 1.5 feet, which is consistent with the average setback of the adjacent properties.

14-526 (a) Transportation Standards

Romasco is directly off of Cumberland Avenue which is classified as a Major Collector. Four additional housing units would have an insignificant impact on the surrounding street systems. Romasco Lane is only 0.15 miles long and has a total travel time of less than 1 minute. The proposed development will not reduce the Level of Service below level "D" as required in in Section 14-526 of the City of Portland Code of Ordinances.

The property will be accessed through one curb cut off Romasco Lane in the same general location of the existing curb cut. The driveway will be greater than twenty feet from adjacent driveways and has a proposed width of ten feet, in accordance with Section 1.7 of the Portland Technical Manual. A sidewalk exists along the entire length of property's frontage with Romasco Lane and will be demolished and replaced by brick pavers.

The off-street parking space standards in Section 14-332.1(k) of the City of Portland Code of Ordinances require one parking space per dwelling unit over three in the (R-6)-District. The proposed development provides three parking spots in the first-floor garage, two more than required. Section 14-526 of the same document requires two bicycle parking spaces for developments with zero to ten vehicle parking spaces. Two bike hangers will be provided within the garage as shown on the Site and Utility Plan, Drawing C-101.

Section 14-526 of the City of Portland Code of Ordinances requires provisions be made for snow storage. The open space on the south west corner will provide sufficient space for snow storage, the required parking spaces are located in the garage and will not be impacted by snow storage.

14-526 (b) Environmental Quality Standards

A. Preservation of Significant Natural Features

The site is currently fully developed with a paved parking area on the southern third of the property and an overgrown lawn area over the rest of the property. In addition, the property is in a highly urbanized neighborhood with little to no stands of trees, wetlands or wildlife habitat. Therefore, it is expected that there are no protected natural resources within the property footprint.

B. Landscaping and Landscape Preservation

There is limited landscaping on the existing property. There is one large tree near the north-east corner. The project will result in the cutting of the tree and bushes in this area.

The proposed site landscaping is shown on the Landscape Plan, Drawing L-1. There will be no exterior servicing areas, dumpsters or on-site utility structures; therefore, screening is not required. There are no required landscaped islands required based on only three (3) proposed parking spaces.

Section 4 of the City of Portland Technical Manual requires that one street tree be planted per unit, unless otherwise approved and spaced thirty (30) to forty five (45) feet on center. The site has a total of sixty-three (63) feet of street frontage. No street trees are proposed at the frontage of the property, as shown on the Landscape Plan L-1. Given that there are no street trees along Romasco lane and the proximity of the building to the roadway. The owner requests a waiver from the installation of four street trees and will provide $800 to the city's tree fund.

C. Water Quality, Stormwater Management, and Erosion Control

The proposed development disturbs approximately 3,500 square feet (approximately 0.1 acres). According to Section 4 of the City of Portland Technical Manual any site disturbing less than one acre is exempt from complying with the Basic and General Standards, and acquiring a Stormwater Permit.

The details of the proposed stormwater management measures are included on the drawings and the Stormwater Management Report in Appendix F and the post construction stormwater management plan in Appendix G.

The proposed erosion control measures are detailed on the drawing set provided.

14-526 (c) Public Infrastructure and Community Safety Standards

A. Consistency with City Master Plans

Romasco lane is not included in the Master Plan for Redevelopment of the Eastern Waterfront.

B. Public Safety and Fire Prevention

The entrances to the building will be well-lit and visible from the street and adjacent walkways to provide natural surveillance as described in Section 3 of the City of Portland Technical Manual.

There is a fire hydrant located on the opposite sidewalk half way down Romasco Lane, within one hundred twenty (120) feet of the proposed building. The City of Portland Technical Manual requires a fire hydrant within five hundred (500) feet of all structures.

C. Availability and Adequate Capacity of Public Utilities

The proposed development is within two hundred (200) feet of the public sanitary collection and treatment system and is therefore required to connect. A City of Portland Wastewater Capacity Application is included as Appendix H. Water service to the building will be provided from the 8-inch water main in Romasco Lane. A Capacity to Serve letter from PWD is included as Appendix I. The electrical and communication services to the building will be connected underground from the existing utility pole on the opposite side of the street. The utility connections are detailed on drawing C-101.

14-526 (d) Site Design Standards

A. Massing, Ventilation and Wind Impact

The building will be consistent with the height and mass of other new construction in the area. The HVAC equipment will be located on the roof and will not negatively affect the abutting properties.

B. Shadows

The building will be oriented such that there are no impacts to public open space or existing vegetation.

C. Snow and Ice Loading

Snow storage will be provided on site where available and hauled away as necessary. Ice from the building is not in danger of falling onto abutting properties as there is at least five feet between the building and abutting property lines.

D. View Corridors

The site is outside of Downtown Vision View Corridor Protection Plan.

E. Historic Resources
Does not apply to this application.

F. Exterior Lighting
Lighting on site will provided with wall packs at each entrance.

The utility pole on the west side of Romasco Lane has an existing street light to illuminate the streets and walks in front of the property.

G. Noise and Vibration
The mechanical equipment will be on the roof of the proposed building and will be screened from Romasco Lane as shown on the Architectural elevations and floor plans.

H. Signage and Wayfinding
Does not apply to this application.

I. Zone Related Design Standards
The proposed multi-family development in the R-6 zone will be architecturally compatible with the surrounding neighborhood. The orientation and placement in relationship to the street of the building is consistent with the neighboring structures. Details of compliance can be found on the architectural drawings and renderings.

J. Solid Waste Generation and Management
Disposal of construction waste will be the responsibility of the selected contractor. Domestic waste will be stored in the trash bin area in the Garage as shown on the floor plan.

CONSTRUCTION MANAGEMENT PLAN

A Construction Management Plan is provided in Appendix J of the application.

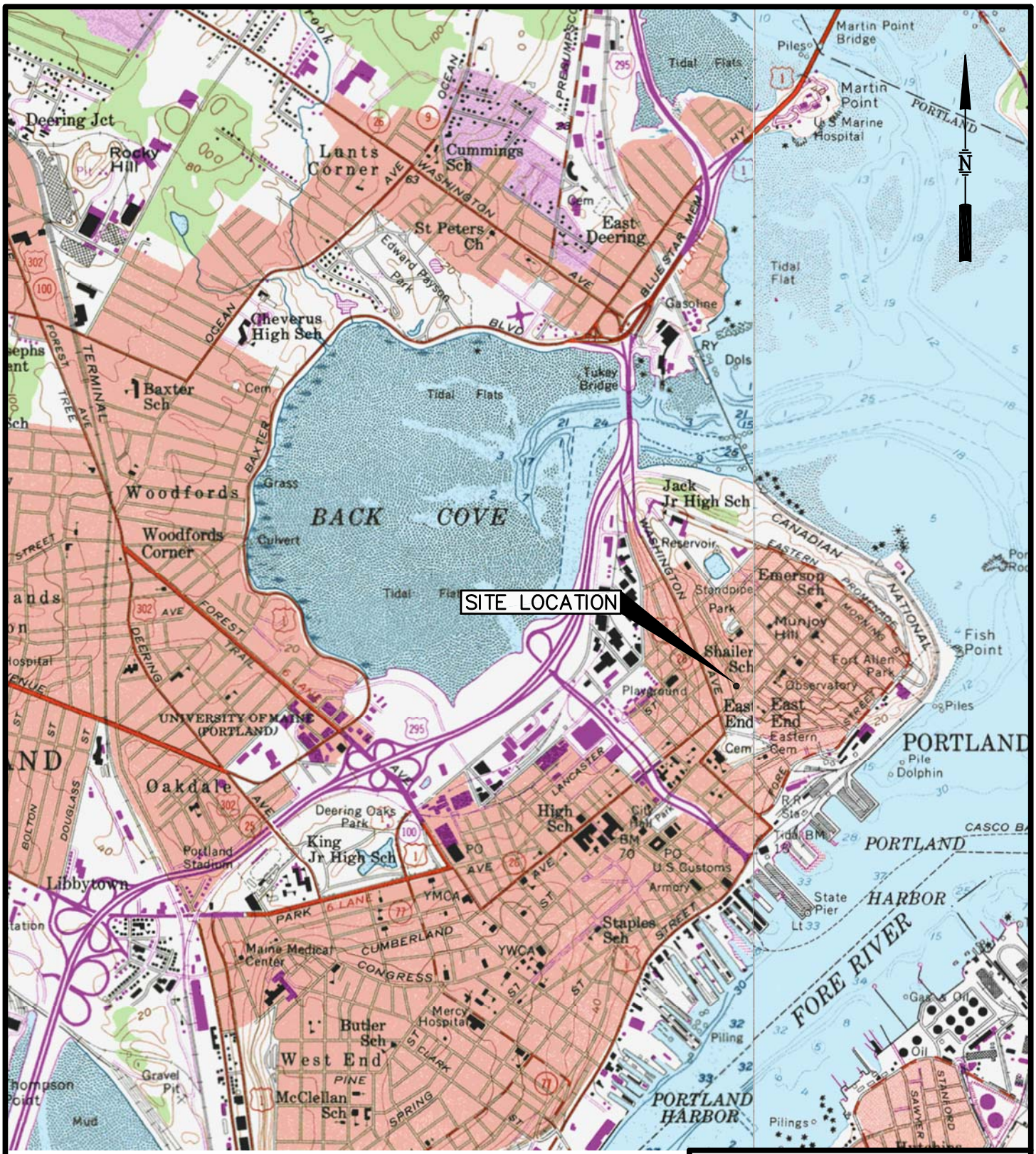
The proposed development will have minimal impacts on the surrounding traffic patterns. During construction there will be additional truck and construction vehicle traffic, but two-lane traffic will not be interrupted. Due to the proximity to the sidewalk on Romasco Lane, foot traffic will be redirected by signs at the nearest intersections during building construction.

The installation of water service, sanitary sewer, and utilities will require a new opening in Romasco Lane. The resulting lane closers will be coordinated with the City and controlled by the contractor.

A written Construction Management Plan will be provided by the selected contractor prior to construction.

APPENDIX A

FIGURE 1 – SITE LOCATION MAP



BASE MAP ADAPTED FROM 7.5 MIN USGS TOPO QUADS
PORTLAND EAST, ME – 1975
PORTLAND WEST, ME – 1978

1000 0 2000 FEET

DWG: SITELOC LMN: NONE CTB: SME–STD REV: 10/19/2015

FIGURE 1
SITE LOCATION MAP
5 ROMASCO LANE
DAVID KLENICKI
PORTLAND, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

\\Nserver\cfs\Klenicki Design\5 Romasco Lane\Acad\Figures\SITELOC.dwg, 10/19/2015 1:50:34 PM, jrl

APPENDIX B

TITLE, RIGHT OR INTEREST

Doc#: 39619 Bk:31728 Pg: 266

WARRANTY DEED
KNOW ALL MEN BY THESE PRESENTS

That I, JUNE P. LANCASTER a/k/a JUNE QUIMBY a/k/a JUNE P. QUMBY of Portland, in the County of Cumberland and State of Maine, in consideration of one dollar and other valuable consideration paid by LEGACY 18 DEVELOPMENT CORPORATION, a Maine corporation with a mailing address of 233 Smith Road, Windham, Maine 04062, receipt of which I hereby acknowledge, do hereby give, grant, bargain and sell unto the said LEGACY 18 DEVELOPMENT CORPORATION of Windham, Maine, with Warranty covenants, the following:

MAINE REAL ESTATE TAX PAID

A certain lot or parcel of land with the buildings thereon, situated in said Portland on the Easterly side of Larch Street (now called Romasco Lane), bounded and described as follows: Commencing on the Easterly side of Larch Street at the Northwesterly corner of a lot of land now or formerly owned by John Kennedy; thence running Northerly by said Larch Street thirty-one (31) feet and six (6) inches, more or less, to land now or formerly owned by John Collins; thence Northeasterly by said Collins land sixty-three (63) feet, more or less, to the Southerly line of the Church lot, so-called; thence by the Church lot twenty-one (21) feet and five (5) inches, more or less, to the land now or formerly owned by the said Kennedy; thence Westerly by said Kennedy's land to Larch Street and the point begun at.

Being the same premises conveyed to June Quimby by the deed of Eleanora Salvatore by deed dated October 25, 1974 and recorded in the Cumberland County Registry of Deeds in Book 3614, Page 0313. The said June Quimby is in fact June P. Lancaster, which name is her birth name.

Also, another certain lot or parcel of land located on the Easterly side of Larch Street (now called Romasco Lane) in said Portland, bounded and described as follows: Commencing on said side of said street at the most Westerly corner of a lot of land called the Patrick Dougher lot, and thence running on said street Northerly thirty-one (31) feet and six (6) inches to a monument; thence Northeasterly about sixty-three (63) feet to a church lot; thence on a line of said Church lot Southerly about twenty-one (21) feet and four (4) inches to the widow Butler lot, so-called; thence Southwesterly on a line of said Butler lot and line of said Dougher lot to this corner and point of beginning on said Larch Street.

(N)

Doc#: 39619 Bk:31728 Pg: 267

Being the same premises conveyed to June P. Quimby by the deed of the City of Portland, Maine dated January 3, 1977 and recorded in the Cumberland County Registry of Deeds in Book 3959, Page 0146. The said June P. Quimby is in fact June P. Lancaster, which is her birth name.

Witness my hand and seal this twenty-first day of August, 2014

June P. Lancaster
By: Stephen J. Schwartz, her
attorney in fact

Received
Recorded Register of Deeds
Aug 22,2014 03:22:34P
Cumberland County
Pamela E. Lovley

STATE OF MAINE
CUMBERLAND, SS.

August 21, 2014

Then personally appeared by said Stephen J. Schwartz of Portland, Maine, attorney in fact for the said June P. Lancaster a/k/a June Lancaster a/k/a June P. Lancaster, and acknowledged the foregoing instrument to be his free act and deed in his said capacity and the free act and deed of said June P. Lancaster.

Before me,

Notary Public/Attorney at Law

SUSAN GAGE KNEDLER
Notary Public. Maine
My Commission Expires November 22 2018

Assessor's Office | 389 Congress Street | Portland, Maine 04101 | Room 115 | (207) 874-8486

This page contains a detailed description of the Parcel ID you selected.

New Search!

Current Owner Information:

CBL	013 J024001
Land Use Type	VACANT LAND
Verify legal use with Inspections Division	
Property Location	5 ROMASCO LN
Owner Information	LEGACY 18 DEVELOPMENT CORPORATION 233 SMITH RD WINDHAM ME 04062
Book and Page	31728/266
Legal Description	13-J-24 ROMASCO LN 5-7 1931 SF
Acres	0.0443

Services

Applications

Doing Business

Maps

Tax Relief

Tax Roll

Q & A

browse city services a-z

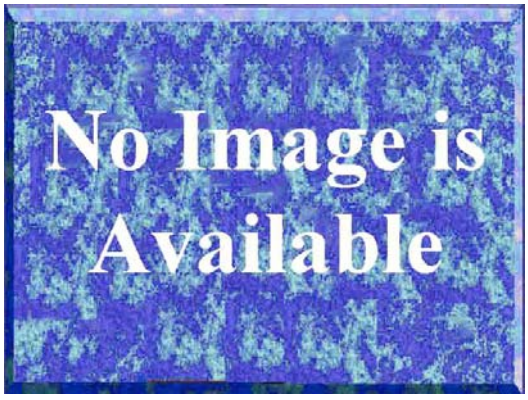
browse facts and links a-z

Best viewed at 800x600, with Internet Explorer

Current Assessed Valuation:

TAX ACCT NO.	1520	**OWNER OF RECORD AS OF APRIL 2015**
LAND VALUE	$10,000.00	LEGACY 18 DEVELOPMENT CORPORATION
BUILDING VALUE	$0.00	233 SMITH RD
NET TAXABLE - REAL ESTATE	$10,000.00	WINDHAM ME 04062
TAX AMOUNT	$206.30	

Any information concerning tax payments should be directed to the Treasury office at 874-8490 or e-mailed.



View Map

Sales Information:

Sale Date	Type	Price	Book/Page
8/22/2014	LAND	$167,000.00	31728/266

New Search!

APPENDIX C

FINANCIAL CAPACITY

1/20/2016

James Whelan
Saco & Biddeford Savings Institution
50 Industrial Park Rd
Saco ME 04072

To whom it may concern;

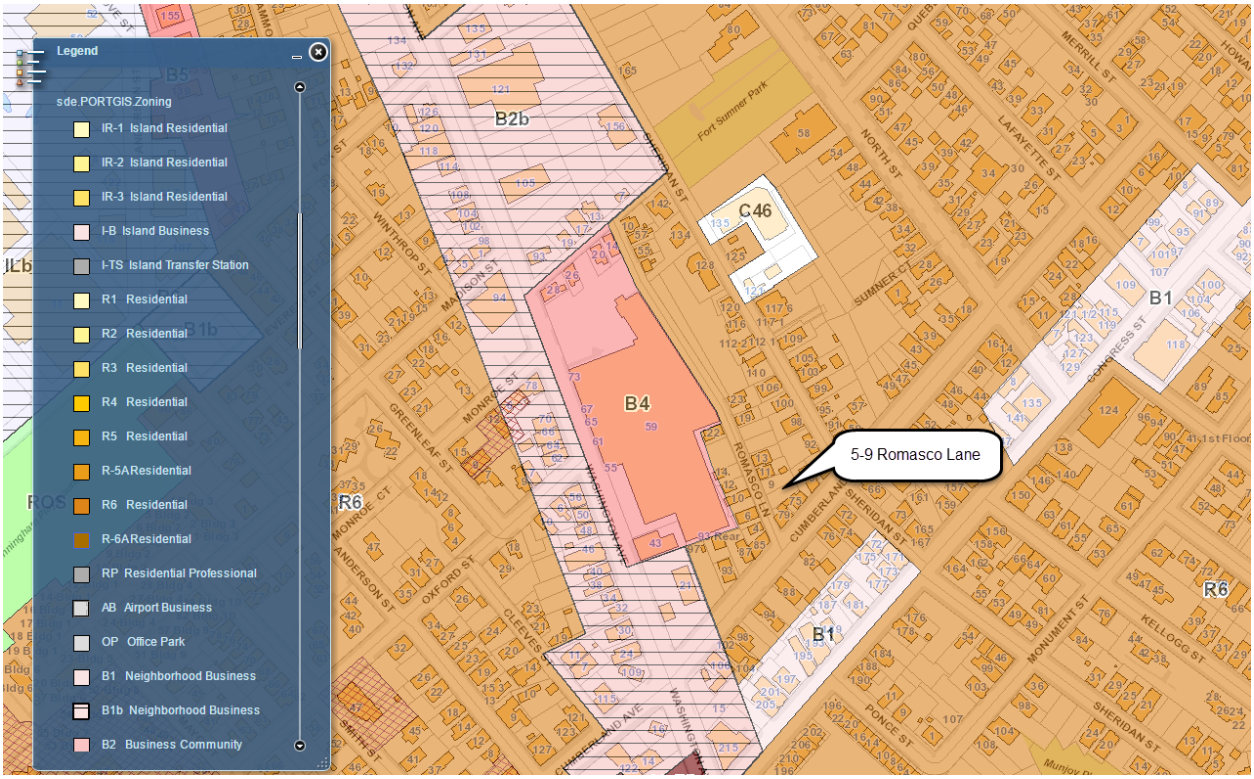
Please be advised that Legacy 18 Development Corp. has applied for and received preliminary approval for construction loan financing for the construction of 4 unit condominium at 9 Romasco Lane in Portland, Maine. The loan is contingent upon final underwriting and approval by the bank's Loan Committee and the issuance of all applicable building permits.

Sincerely,

James Whelan
Vice President
Saco & Biddeford Savings Institution

APPENDIX D

CITY OF PORTLAND GIS MAP


Legend
sde.PORTGIS.Zoning
IR-1 Island Residential
IR-2 Island Residential
IR-3 Island Residential
I-B Island Business
I-TS Island Transfer Station
R1 Residential
R2 Residential
R3 Residential
R4 Residential
R5 Residential
R-5A Residential
R6 Residential
R-6A Residential
RP Residential Professional
AB Airport Business
OP Office Park
B1 Neighborhood Business
B1b Neighborhood Business
B2 Business Community
B2b
B4
C46
B1
R6
5-9 Romasco Lane
Fort Sumner Park
ROMASCO LN
SHERIDAN ST
MONUMENT ST
KELLOGG ST
PONCE ST
CUMBERLAND AVE
WASHINGTON AVE
MONROE ST
MONROE CT
GREENLEAF ST
OXFORD ST
ANDERSON ST
CLEEVES
SMITH ST
WINTHROP ST
MADISON ST
NORTH ST
SUMNER ST
LAFAYETTE ST
MERRILL ST
CONGRESS ST

APPENDIX E

FEMA FLOODPLAIN MAP


5 & 9 Romasco Lane
CASCO BAY
PORTLAND HARBOR
CASCO BAY
ZONE V2
ZONE A1
ZONE A2
ZONE A3
ZONE A4
ZONE C
ZONE V3
LITTLE DIAMOND ISLAND
HOUSE ISLAND
FORT GEORGES
FORT SCAMMEL POINT
CUSHING ISLAND
CORPORATE LIMITS
COASTAL BASE FLOOD ELEVATIONS APPLY ONLY LANDWARD OF 0.0 NGVD
ELEVATION REFERENCE MARKS
DESCRIPTION OF LOCATION
KEY TO MAP
EXPLANATION OF ZONE DESIGNATIONS
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CITY OF PORTLAND, MAINE
CUMBERLAND COUNTY
PANEL 14 OF 17
COMMUNITY-PANEL NUMBER
230051 0014 B
EFFECTIVE DATE:
JULY 17, 1986
Federal Emergency Management Agency

APPENDIX F

STORMWATER MANAGEMENT REPORT

CITY OF PORTLAND, MAINE
PLANNING BOARD
STORMWATER MANAGEMENT REPORT

Prepared for

LEGACY 18 DEVELOPMENT INC.
4-UNIT CONDO BUILDING

5 & 9 Romasco Lane
Portland, Maine

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STORMWATER MANAGEMENT REPORT

1.0 INTRODUCTION

The following outlines the stormwater management design for the proposed condominium building and associated site improvements at 5 & 9 Romasco Lane 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 and by the City of Portland Engineer during the pre-application meeting.

2.0 PROJECT DESCRIPTION

Legacy 18 Development Inc. proposes to construct a four-story, 1,955-square-foot multifamily condominium building on the existing 3,496 square foot lot. The site is currently fully developed with 880 square feet of paved parking along Romasco Lane, a recently demolished residential building and gravel and overgrown lawn on the remainder of the site. The project will include the proposed building, 143 square feet of paved vehicular access and sidewalks, plantings, utility connections and an infiltration basin to address stormwater. The project will result in no increase in developed area and an increase in impervious area of 600 square feet. The increase in impervious area is less than 1,000 square feet, therefore the project is not required to provide stormwater treatment.

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 Hinckley gravelly sandy loam (HIB) which is classified as “excessively drained” and hydrologic soil group (HSG) A soils.

In existing conditions, the majority of the site drains to the west and then flows onto Romasco Lane. The runoff from the eastern portion of the site is then captured in an existing Catch Basin in Romasco Lane. The Catch Basin is identified as Analysis Point 1.

The northern portion of the site drains onto the abutters property and into the curb and gutter system in Romasco Lane. From there the drainage enters the combined sewer through a Catch Basin 160' to the North. This Catch Basin has been identified as Analysis Point 2.

In developed conditions, the flow to westerly abutter's yard has been removed. The building roof drains and the areas to the east of the building will flow into a shallow infiltration basin in the backyard. The overflow from the infiltration basin during larger storms will be captured in a field inlet at the north corner of the building. From there the runoff will be conveyed into the existing catch basin in the street through a closed storm drain. The southern portion of the site will sheet flow to Romasco Lane, similar to existing conditions.

Pre-development and post-development stormwater management plans identify the on-site drainage patterns before and after development (See Drawings D-100 and D-101) and are included in the plan set. 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

Based on the City Standards Projects with a net increase of impervious area less than 1,000 sf are not required to provide stormwater treatment. However, an infiltration basin is proposed for this project to capture roof runoff at the rear of the building.

TABLE 1

PROPOSED INCREASE OF IMPERVIOUS AREA

	Existing (sf)	Post Development (sf)	Difference (sf)
Total Impervious			
Building	639	1,955	1,316
Pavement	865	143	-722
Open Space	1,992	1,398	594

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 through the proposed infiltration basin on the east portion of the property. Table 2 below demonstrates peak flow rates from the subwatershed areas at the two analysis points shown on Drawings D-100 and D-101.

TABLE 2

STORMWATER QUANTITY SUMMARY

	2-yr Storm		10-yr Storm		25-yr Storm	
AP	Pre- (cfs)	Post- (cfs)	Pre- (cfs)	Post- (cfs)	Pre- (cfs)	Post- (cfs)
1	0.27	0.11	0.55	0.55	0.68	0.70
2	0.37	0.36	1.29	1.17	1.80	1.80

The post-development flows have been analyzed for the 2-year, 10-year and 25-year storms using HydroCAD (see Appendices C and D). The infiltration qualities of the soil for the infiltration basin were conservatively estimated at 1.42 inches/hour, based on the National Resources Conservation Service's characterization of the soils on site (Hinckley gravelly sandy loam).

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.

If the BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator of the BMP shall take corrective action(s) to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective action(s) to the department of public services ("DPS") in the annual report.

The owner or operator of a BMP or a qualified post-construction stormwater inspector hired by that person, shall, on or by June 30 of each year, provide a completed and signed certification to DPS in a form provided by DPS, certifying that the person has inspected the BMP(s) and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they require maintenance or repair, including the record of the deficiency and corrective action(s) taken.

7.0 SUMMARY

The stormwater management for the 5 & 9 Romasco Lane project will have no adverse impact to the downstream drainage or abutting properties and additional storage and infiltration is provided to decrease flows to the City's combined sewer during rainfall events.

APPENDIX A

NRCS SOIL REPORT

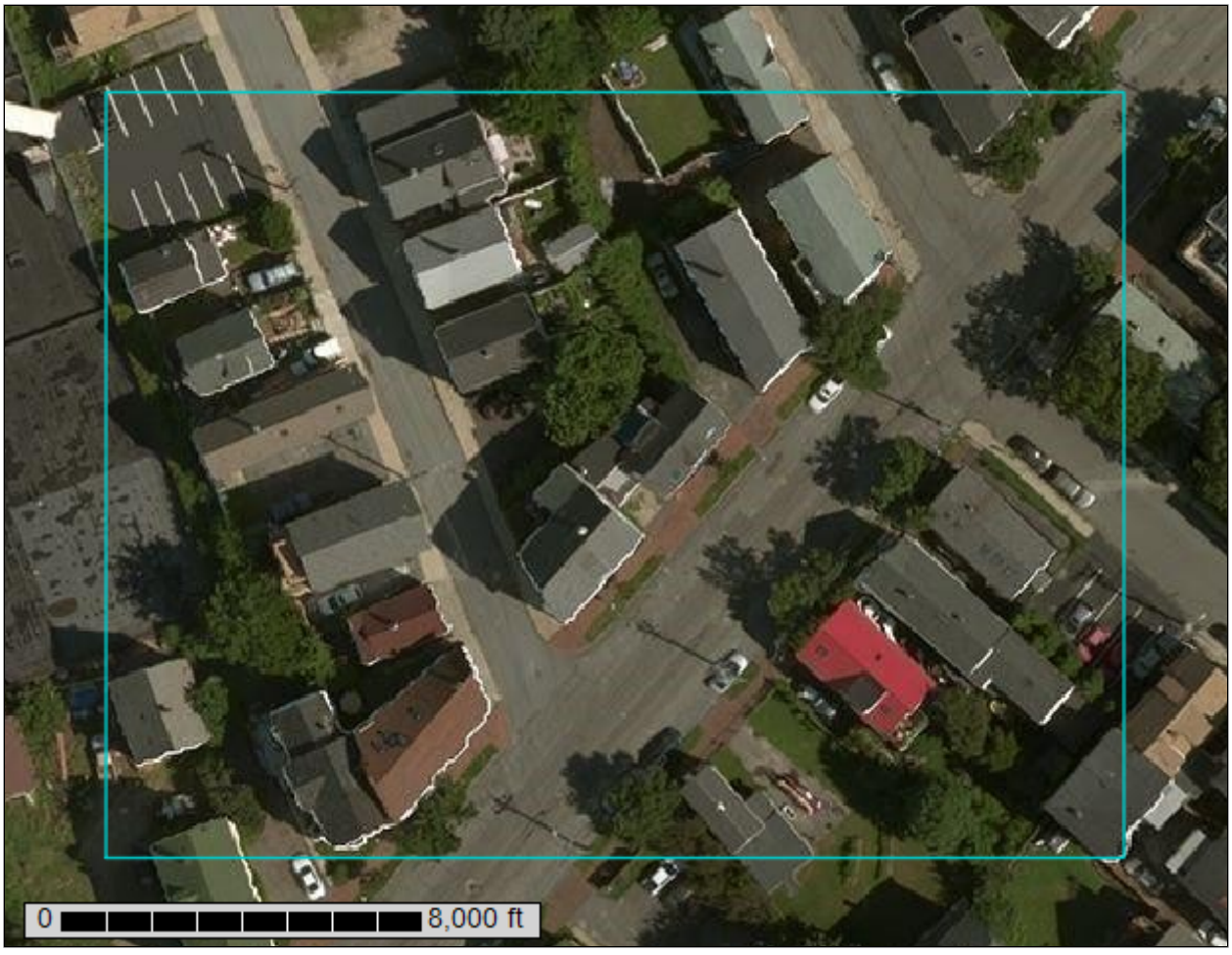
United States Department of Agriculture

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



October 19, 2015

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 (http://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

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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: http://websoilsurvey.nrcs.usda.gov
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 9, Sep 13, 2014

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

Date(s) aerial images were photographed: Jul 31, 2013—Aug 11, 2013

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

Map Unit Legend

Cumberland County and Part of Oxford County, Maine (ME005)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
HIB	Hinckley gravelly sandy loam, 3 to 8 percent slopes	1.9	100.0%
Totals for Area of Interest		**1.9**	**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

HlB—Hinckley gravelly sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: blhp
Elevation: 10 to 2,000 feet
Mean annual precipitation: 30 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy-skeletal glaciofluvial deposits derived from granite and gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
H1 - 1 to 8 inches: gravelly sandy loam
H2 - 8 to 11 inches: gravelly sandy loam
H3 - 11 to 25 inches: gravelly loamy sand
H4 - 25 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A

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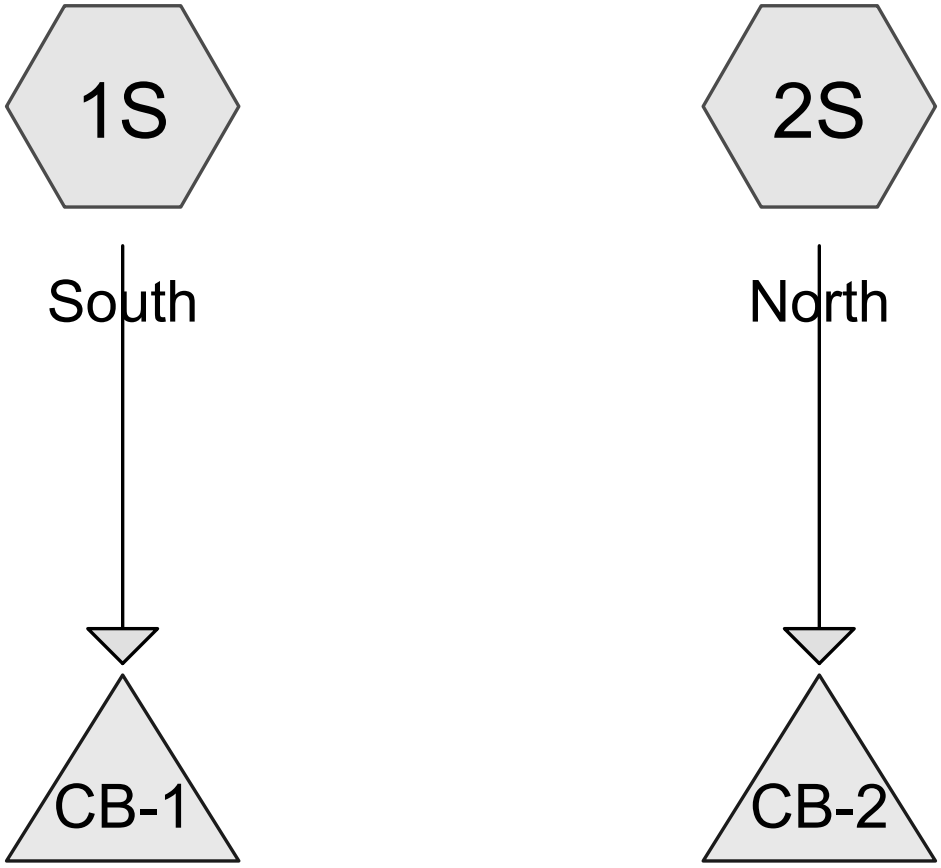
APPENDIX B

PRE-DEVELOPMENT HYDROCAD CALCULATIONS



Subcat Reach Pond Link

Routing Diagram for EXISTING Klenicki- 5-9 Romasco Lane
Prepared by Sevee and Maher Engineers, Inc., Printed 1/20/2016

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.463	39	>75% Grass cover, Good, HSG A (1S, 2S)
0.357	98	Impervious (2S)
0.116	98	Paved parking, HSG A (1S)
0.936	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.579	HSG A	1S, 2S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.357	Other	2S
0.936		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.463	0.000	0.000	0.000	0.000	0.463	>75% Grass cover, Good	1S, 2S
0.000	0.000	0.000	0.000	0.357	0.357	Impervious	2S
0.116	0.000	0.000	0.000	0.000	0.116	Paved parking	1S
0.579	**0.000**	**0.000**	**0.000**	**0.357**	**0.936**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Runoff Area=6,978 sf 72.48% Impervious Runoff Depth=1.38"
Tc=5.0 min CN=82 Runoff=0.27 cfs 0.018 af

Subcatchment 2S: North Runoff Area=33,810 sf 46.04% Impervious Runoff Depth=0.54"
Flow Length=260' Tc=6.6 min CN=66 Runoff=0.37 cfs 0.035 af

Pond CB-1: Inflow=0.27 cfs 0.018 af
Primary=0.27 cfs 0.018 af

Pond CB-2: Inflow=0.37 cfs 0.035 af
Primary=0.37 cfs 0.035 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.054 af Average Runoff Depth = 0.69"
49.44% Pervious = 0.463 ac 50.56% Impervious = 0.473 ac

Summary for Subcatchment 1S: South

Runoff = 0.27 cfs @ 12.08 hrs, Volume= 0.018 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
1,920	39	>75% Grass cover, Good, HSG A
5,058	98	Paved parking, HSG A
6,978	82	Weighted Average
1,920		27.52% Pervious Area
5,058		72.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 MIN MINIMUM**

Summary for Subcatchment 2S: North

Runoff = 0.37 cfs @ 12.12 hrs, Volume= 0.035 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	18,245	39	>75% Grass cover, Good, HSG A
*	15,565	98	Impervious
	33,810	66	Weighted Average
	18,245		53.96% Pervious Area
	15,565		46.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	54	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	206	0.0339	3.74		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
6.6	260	Total			

Summary for Pond CB-1:

Inflow Area = 0.160 ac, 72.48% Impervious, Inflow Depth = 1.38" for 2-Year event
Inflow = 0.27 cfs @ 12.08 hrs, Volume= 0.018 af
Primary = 0.27 cfs @ 12.08 hrs, Volume= 0.018 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 CB-2:

Inflow Area = 0.776 ac, 46.04% Impervious, Inflow Depth = 0.54" for 2-Year event
Inflow = 0.37 cfs @ 12.12 hrs, Volume= 0.035 af
Primary = 0.37 cfs @ 12.12 hrs, Volume= 0.035 af, Atten= 0%, Lag= 0.0 min

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

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Runoff Area=6,978 sf 72.48% Impervious Runoff Depth=2.81"
Tc=5.0 min CN=82 Runoff=0.55 cfs 0.038 af

Subcatchment 2S: North Runoff Area=33,810 sf 46.04% Impervious Runoff Depth=1.53"
Flow Length=260' Tc=6.6 min CN=66 Runoff=1.29 cfs 0.099 af

Pond CB-1: Inflow=0.55 cfs 0.038 af
Primary=0.55 cfs 0.038 af

Pond CB-2: Inflow=1.29 cfs 0.099 af
Primary=1.29 cfs 0.099 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.136 af Average Runoff Depth = 1.75"
49.44% Pervious = 0.463 ac 50.56% Impervious = 0.473 ac

Summary for Subcatchment 1S: South

Runoff = 0.55 cfs @ 12.07 hrs, Volume= 0.038 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
1,920	39	>75% Grass cover, Good, HSG A
5,058	98	Paved parking, HSG A
6,978	82	Weighted Average
1,920		27.52% Pervious Area
5,058		72.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 MIN MINIMUM**

Summary for Subcatchment 2S: North

Runoff = 1.29 cfs @ 12.10 hrs, Volume= 0.099 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

	Area (sf)	CN	Description
	18,245	39	>75% Grass cover, Good, HSG A
*	15,565	98	Impervious
	33,810	66	Weighted Average
	18,245		53.96% Pervious Area
	15,565		46.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	54	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	206	0.0339	3.74		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
6.6	260	Total			

Summary for Pond CB-1:

Inflow Area = 0.160 ac, 72.48% Impervious, Inflow Depth = 2.81" for 10-Year event
Inflow = 0.55 cfs @ 12.07 hrs, Volume= 0.038 af
Primary = 0.55 cfs @ 12.07 hrs, Volume= 0.038 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 CB-2:

Inflow Area = 0.776 ac, 46.04% Impervious, Inflow Depth = 1.53" for 10-Year event
Inflow = 1.29 cfs @ 12.10 hrs, Volume= 0.099 af
Primary = 1.29 cfs @ 12.10 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min

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

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: South Runoff Area=6,978 sf 72.48% Impervious Runoff Depth=3.53"
Tc=5.0 min CN=82 Runoff=0.68 cfs 0.047 af

Subcatchment 2S: North Runoff Area=33,810 sf 46.04% Impervious Runoff Depth=2.08"
Flow Length=260' Tc=6.6 min CN=66 Runoff=1.80 cfs 0.134 af

Pond CB-1: Inflow=0.68 cfs 0.047 af
Primary=0.68 cfs 0.047 af

Pond CB-2: Inflow=1.80 cfs 0.134 af
Primary=1.80 cfs 0.134 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.181 af Average Runoff Depth = 2.33"
49.44% Pervious = 0.463 ac 50.56% Impervious = 0.473 ac

Summary for Subcatchment 1S: South

Runoff = 0.68 cfs @ 12.07 hrs, Volume= 0.047 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
1,920	39	>75% Grass cover, Good, HSG A
5,058	98	Paved parking, HSG A
6,978	82	Weighted Average
1,920		27.52% Pervious Area
5,058		72.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 MIN MINIMUM**

Summary for Subcatchment 2S: North

Runoff = 1.80 cfs @ 12.10 hrs, Volume= 0.134 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
	18,245	39	>75% Grass cover, Good, HSG A
*	15,565	98	Impervious
	33,810	66	Weighted Average
	18,245		53.96% Pervious Area
	15,565		46.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	54	0.0250	0.16		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	206	0.0339	3.74		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
6.6	260	Total			

Summary for Pond CB-1:

Inflow Area = 0.160 ac, 72.48% Impervious, Inflow Depth = 3.53" for 25-Year event
Inflow = 0.68 cfs @ 12.07 hrs, Volume= 0.047 af
Primary = 0.68 cfs @ 12.07 hrs, Volume= 0.047 af, Atten= 0%, Lag= 0.0 min

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

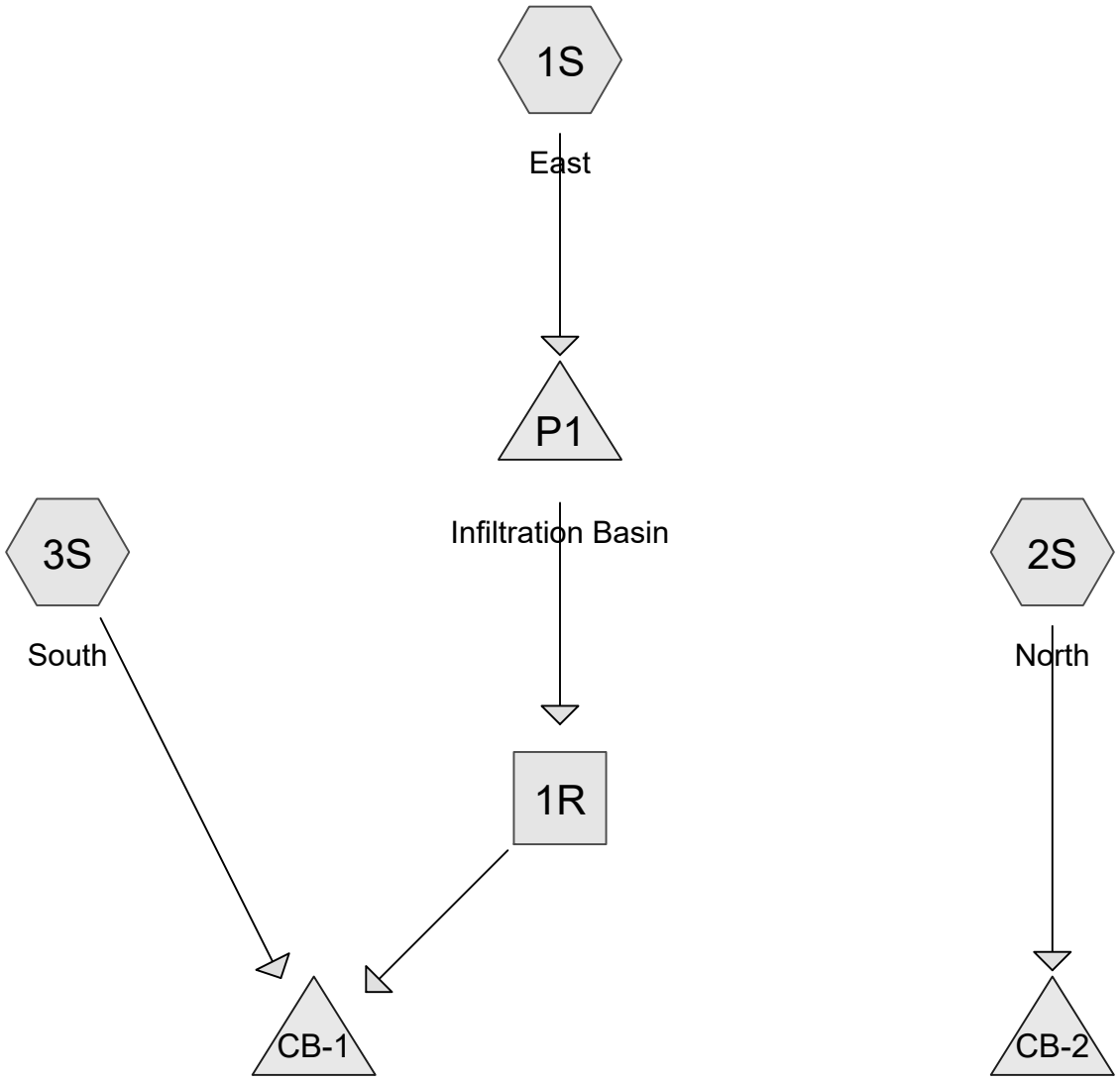
Summary for Pond CB-2:

Inflow Area = 0.776 ac, 46.04% Impervious, Inflow Depth = 2.08" for 25-Year event
Inflow = 1.80 cfs @ 12.10 hrs, Volume= 0.134 af
Primary = 1.80 cfs @ 12.10 hrs, Volume= 0.134 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



Subcat Reach Pond Link

Routing Diagram for PROPOSED Klenicki- 5-9 Romasco Lane
Prepared by Sevee and Maher Engineers, Inc., Printed 1/20/2016

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.449	39	>75% Grass cover, Good, HSG A (1S, 2S, 3S)
0.408	98	Impervious (2S, 3S)
0.021	98	Paved parking, HSG A (1S)
0.058	98	Unconnected roofs, HSG C (1S)
0.936	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.471	HSG A	1S, 2S, 3S
0.000	HSG B	
0.058	HSG C	1S
0.000	HSG D	
0.408	Other	2S, 3S
0.936		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.449	0.000	0.000	0.000	0.000	0.449	>75% Grass cover, Good	1S, 2S, 3S
0.000	0.000	0.000	0.000	0.408	0.408	Impervious	2S, 3S
0.021	0.000	0.000	0.000	0.000	0.021	Paved parking	1S
0.000	0.000	0.058	0.000	0.000	0.058	Unconnected roofs	1S
0.471	**0.000**	**0.058**	**0.000**	**0.408**	**0.936**	**TOTAL AREA**	

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: East Runoff Area=4,737 sf 72.83% Impervious Runoff Depth=1.38"
Tc=5.0 min CN=82 Runoff=0.18 cfs 0.012 af

Subcatchment 2S: North Runoff Area=33,034 sf 47.12% Impervious Runoff Depth=0.58"
Flow Length=306' Tc=10.2 min CN=67 Runoff=0.36 cfs 0.037 af

Subcatchment 3S: South Runoff Area=3,002 sf 72.92% Impervious Runoff Depth=1.38"
Tc=5.0 min CN=82 Runoff=0.11 cfs 0.008 af

Reach 1R: Avg. Flow Depth=0.02' Max Vel=2.88 fps Inflow=0.07 cfs 0.005 af
n=0.013 L=69.0' S=0.0957 '/' Capacity=45.86 cfs Outflow=0.07 cfs 0.005 af

Pond CB-1: Inflow=0.12 cfs 0.013 af
Primary=0.12 cfs 0.013 af

Pond CB-2: Inflow=0.36 cfs 0.037 af
Primary=0.36 cfs 0.037 af

Pond P1: Infiltration Basin Peak Elev=101.65' Storage=211 cf Inflow=0.18 cfs 0.012 af
Discarded=0.00 cfs 0.004 af Primary=0.07 cfs 0.005 af Outflow=0.07 cfs 0.009 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.057 af Average Runoff Depth = 0.74"
47.99% Pervious = 0.449 ac 52.01% Impervious = 0.487 ac

Summary for Subcatchment 1S: East

Runoff = 0.18 cfs @ 12.08 hrs, Volume= 0.012 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
2,518	98	Unconnected roofs, HSG C
1,287	39	>75% Grass cover, Good, HSG A
932	98	Paved parking, HSG A
4,737	82	Weighted Average
1,287		27.17% Pervious Area
3,450		72.83% Impervious Area
2,518		72.99% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 minute min**

Summary for Subcatchment 2S: North

Runoff = 0.36 cfs @ 12.17 hrs, Volume= 0.037 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	17,469	39	>75% Grass cover, Good, HSG A
*	15,565	98	Impervious
	33,034	67	Weighted Average
	17,469		52.88% Pervious Area
	15,565		47.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	206	0.0339	3.74		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
10.2	306	Total			

Summary for Subcatchment 3S: South

Runoff = 0.11 cfs @ 12.08 hrs, Volume= 0.008 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
	813	39	>75% Grass cover, Good, HSG A
*	2,189	98	Impervious
	3,002	82	Weighted Average
	813		27.08% Pervious Area
	2,189		72.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 minute min**

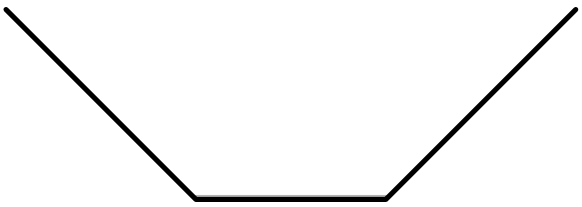
Summary for Reach 1R:

Inflow Area = 0.109 ac, 72.83% Impervious, Inflow Depth = 0.55" for 2-Year event
Inflow = 0.07 cfs @ 12.32 hrs, Volume= 0.005 af
Outflow = 0.07 cfs @ 12.33 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.88 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.68 fps, Avg. Travel Time= 0.7 min

Peak Storage= 2 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.02'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 45.86 cfs

1.00' x 1.00' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 69.0' Slope= 0.0957 '/'
Inlet Invert= 101.60', Outlet Invert= 95.00'



Summary for Pond CB-1:

Inflow Area = 0.178 ac, 72.86% Impervious, Inflow Depth = 0.87" for 2-Year event
Inflow = 0.12 cfs @ 12.31 hrs, Volume= 0.013 af
Primary = 0.12 cfs @ 12.31 hrs, Volume= 0.013 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 CB-2:

Inflow Area = 0.758 ac, 47.12% Impervious, Inflow Depth = 0.58" for 2-Year event
Inflow = 0.36 cfs @ 12.17 hrs, Volume= 0.037 af
Primary = 0.36 cfs @ 12.17 hrs, Volume= 0.037 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 P1: Infiltration Basin

Inflow Area = 0.109 ac, 72.83% Impervious, Inflow Depth = 1.38" for 2-Year event
Inflow = 0.18 cfs @ 12.08 hrs, Volume= 0.012 af
Outflow = 0.07 cfs @ 12.32 hrs, Volume= 0.009 af, Atten= 60%, Lag= 14.6 min
Discarded = 0.00 cfs @ 12.32 hrs, Volume= 0.004 af
Primary = 0.07 cfs @ 12.32 hrs, Volume= 0.005 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 101.65' @ 12.32 hrs Surf.Area= 331 sf Storage= 211 cf

Plug-Flow detention time= 249.6 min calculated for 0.009 af (73% of inflow)
Center-of-Mass det. time= 156.3 min (994.8 - 838.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	345 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	5	0	0
101.00	121	63	63
101.30	219	51	114
102.00	440	231	345

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.30'	**1.420 in/hr Exfiltration over Surface area above 101.30'** Conductivity to Groundwater Elevation = 0.00' Excluded Surface area = 219 sf
#2	Primary	101.60'	**2.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.32 hrs HW=101.65' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.07 cfs @ 12.32 hrs HW=101.65' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.07 cfs @ 0.65 fps)

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: East Runoff Area=4,737 sf 72.83% Impervious Runoff Depth=2.81"
Tc=5.0 min CN=82 Runoff=0.37 cfs 0.025 af

Subcatchment 2S: North Runoff Area=33,034 sf 47.12% Impervious Runoff Depth=1.60"
Flow Length=306' Tc=10.2 min CN=67 Runoff=1.17 cfs 0.101 af

Subcatchment 3S: South Runoff Area=3,002 sf 72.92% Impervious Runoff Depth=2.81"
Tc=5.0 min CN=82 Runoff=0.24 cfs 0.016 af

Reach 1R: Avg. Flow Depth=0.06' Max Vel=5.19 fps Inflow=0.34 cfs 0.018 af
n=0.013 L=69.0' S=0.0957 '/' Capacity=45.86 cfs Outflow=0.34 cfs 0.018 af

Pond CB-1: Inflow=0.56 cfs 0.034 af
Primary=0.56 cfs 0.034 af

Pond CB-2: Inflow=1.17 cfs 0.101 af
Primary=1.17 cfs 0.101 af

Pond P1: Infiltration Basin Peak Elev=101.76' Storage=246 cf Inflow=0.37 cfs 0.025 af
Discarded=0.00 cfs 0.004 af Primary=0.34 cfs 0.018 af Outflow=0.35 cfs 0.022 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.143 af Average Runoff Depth = 1.83"
47.99% Pervious = 0.449 ac 52.01% Impervious = 0.487 ac

Summary for Subcatchment 1S: East

Runoff = 0.37 cfs @ 12.07 hrs, Volume= 0.025 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

Area (sf)	CN	Description
2,518	98	Unconnected roofs, HSG C
1,287	39	>75% Grass cover, Good, HSG A
932	98	Paved parking, HSG A
4,737	82	Weighted Average
1,287		27.17% Pervious Area
3,450		72.83% Impervious Area
2,518		72.99% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 minute min**

Summary for Subcatchment 2S: North

Runoff = 1.17 cfs @ 12.15 hrs, Volume= 0.101 af, Depth= 1.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

	Area (sf)	CN	Description
	17,469	39	>75% Grass cover, Good, HSG A
*	15,565	98	Impervious
	33,034	67	Weighted Average
	17,469		52.88% Pervious Area
	15,565		47.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	206	0.0339	3.74		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
10.2	306	Total			

Summary for Subcatchment 3S: South

Runoff = 0.24 cfs @ 12.07 hrs, Volume= 0.016 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.70"

	Area (sf)	CN	Description
	813	39	>75% Grass cover, Good, HSG A
*	2,189	98	Impervious
	3,002	82	Weighted Average
	813		27.08% Pervious Area
	2,189		72.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 minute min**

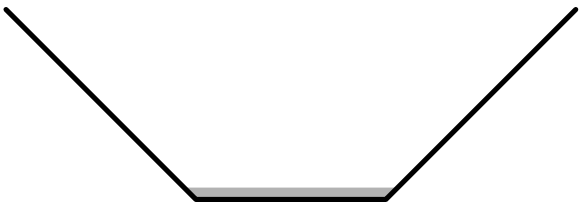
Summary for Reach 1R:

Inflow Area = 0.109 ac, 72.83% Impervious, Inflow Depth = 1.95" for 10-Year event
Inflow = 0.34 cfs @ 12.10 hrs, Volume= 0.018 af
Outflow = 0.34 cfs @ 12.11 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.19 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 0.6 min

Peak Storage= 5 cf @ 12.11 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 45.86 cfs

1.00' x 1.00' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 69.0' Slope= 0.0957 '/'
Inlet Invert= 101.60', Outlet Invert= 95.00'



Summary for Pond CB-1:

Inflow Area = 0.178 ac, 72.86% Impervious, Inflow Depth = 2.29" for 10-Year event
Inflow = 0.56 cfs @ 12.09 hrs, Volume= 0.034 af
Primary = 0.56 cfs @ 12.09 hrs, Volume= 0.034 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 CB-2:

Inflow Area = 0.758 ac, 47.12% Impervious, Inflow Depth = 1.60" for 10-Year event
Inflow = 1.17 cfs @ 12.15 hrs, Volume= 0.101 af
Primary = 1.17 cfs @ 12.15 hrs, Volume= 0.101 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 P1: Infiltration Basin

Inflow Area = 0.109 ac, 72.83% Impervious, Inflow Depth = 2.81" for 10-Year event
Inflow = 0.37 cfs @ 12.07 hrs, Volume= 0.025 af
Outflow = 0.35 cfs @ 12.10 hrs, Volume= 0.022 af, Atten= 7%, Lag= 1.8 min
Discarded = 0.00 cfs @ 12.10 hrs, Volume= 0.004 af
Primary = 0.34 cfs @ 12.10 hrs, Volume= 0.018 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 101.76' @ 12.10 hrs Surf.Area= 363 sf Storage= 246 cf

Plug-Flow detention time= 132.3 min calculated for 0.022 af (87% of inflow)
Center-of-Mass det. time= 72.8 min (890.8 - 817.9)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	345 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	5	0	0
101.00	121	63	63
101.30	219	51	114
102.00	440	231	345

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.30'	**1.420 in/hr Exfiltration over Surface area above 101.30'** Conductivity to Groundwater Elevation = 0.00' Excluded Surface area = 219 sf
#2	Primary	101.60'	**2.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.00 cfs @ 12.10 hrs HW=101.75' (Free Discharge)
↑—**1=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.34 cfs @ 12.10 hrs HW=101.75' (Free Discharge)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 0.34 cfs @ 1.10 fps)

Time span=0.00-30.00 hrs, dt=0.01 hrs, 3001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: East Runoff Area=4,737 sf 72.83% Impervious Runoff Depth=3.53"
Tc=5.0 min CN=82 Runoff=0.46 cfs 0.032 af

Subcatchment 2S: North Runoff Area=33,034 sf 47.12% Impervious Runoff Depth=2.16"
Flow Length=306' Tc=10.2 min CN=67 Runoff=1.62 cfs 0.136 af

Subcatchment 3S: South Runoff Area=3,002 sf 72.92% Impervious Runoff Depth=3.53"
Tc=5.0 min CN=82 Runoff=0.29 cfs 0.020 af

Reach 1R: Avg. Flow Depth=0.07' Max Vel=5.64 fps Inflow=0.43 cfs 0.024 af
n=0.013 L=69.0' S=0.0957 '/' Capacity=45.86 cfs Outflow=0.43 cfs 0.024 af

Pond CB-1: Inflow=0.71 cfs 0.044 af
Primary=0.71 cfs 0.044 af

Pond CB-2: Inflow=1.62 cfs 0.136 af
Primary=1.62 cfs 0.136 af

Pond P1: Infiltration Basin Peak Elev=101.78' Storage=256 cf Inflow=0.46 cfs 0.032 af
Discarded=0.01 cfs 0.005 af Primary=0.43 cfs 0.024 af Outflow=0.44 cfs 0.029 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.189 af Average Runoff Depth = 2.42"
47.99% Pervious = 0.449 ac 52.01% Impervious = 0.487 ac

Summary for Subcatchment 1S: East

Runoff = 0.46 cfs @ 12.07 hrs, Volume= 0.032 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

Area (sf)	CN	Description
2,518	98	Unconnected roofs, HSG C
1,287	39	>75% Grass cover, Good, HSG A
932	98	Paved parking, HSG A
4,737	82	Weighted Average
1,287		27.17% Pervious Area
3,450		72.83% Impervious Area
2,518		72.99% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 minute min**

Summary for Subcatchment 2S: North

Runoff = 1.62 cfs @ 12.15 hrs, Volume= 0.136 af, Depth= 2.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
	17,469	39	>75% Grass cover, Good, HSG A
*	15,565	98	Impervious
	33,034	67	Weighted Average
	17,469		52.88% Pervious Area
	15,565		47.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0250	0.18		**Sheet Flow, A-B** Grass: Short n= 0.150 P2= 3.00"
0.9	206	0.0339	3.74		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
10.2	306	Total			

Summary for Subcatchment 3S: South

Runoff = 0.29 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 3.53"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=5.50"

	Area (sf)	CN	Description
	813	39	>75% Grass cover, Good, HSG A
*	2,189	98	Impervious
	3,002	82	Weighted Average
	813		27.08% Pervious Area
	2,189		72.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, 5 minute min**

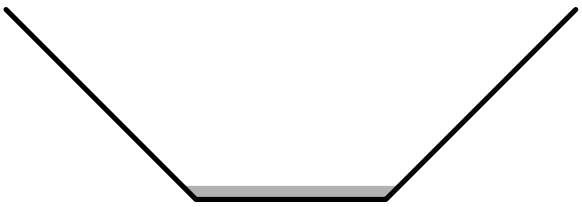
Summary for Reach 1R:

Inflow Area = 0.109 ac, 72.83% Impervious, Inflow Depth = 2.66" for 25-Year event
Inflow = 0.43 cfs @ 12.10 hrs, Volume= 0.024 af
Outflow = 0.43 cfs @ 12.11 hrs, Volume= 0.024 af, Atten= 0%, Lag= 0.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.64 fps, Min. Travel Time= 0.2 min
Avg. Velocity = 1.88 fps, Avg. Travel Time= 0.6 min

Peak Storage= 5 cf @ 12.10 hrs
Average Depth at Peak Storage= 0.07'
Bank-Full Depth= 1.00' Flow Area= 2.0 sf, Capacity= 45.86 cfs

1.00' x 1.00' deep channel, n= 0.013 Asphalt, smooth
Side Slope Z-value= 1.0 '/' Top Width= 3.00'
Length= 69.0' Slope= 0.0957 '/'
Inlet Invert= 101.60', Outlet Invert= 95.00'



Summary for Pond CB-1:

Inflow Area = 0.178 ac, 72.86% Impervious, Inflow Depth = 3.00" for 25-Year event
Inflow = 0.71 cfs @ 12.09 hrs, Volume= 0.044 af
Primary = 0.71 cfs @ 12.09 hrs, Volume= 0.044 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 CB-2:

Inflow Area = 0.758 ac, 47.12% Impervious, Inflow Depth = 2.16" for 25-Year event
Inflow = 1.62 cfs @ 12.15 hrs, Volume= 0.136 af
Primary = 1.62 cfs @ 12.15 hrs, Volume= 0.136 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 P1: Infiltration Basin

Inflow Area = 0.109 ac, 72.83% Impervious, Inflow Depth = 3.53" for 25-Year event
Inflow = 0.46 cfs @ 12.07 hrs, Volume= 0.032 af
Outflow = 0.44 cfs @ 12.10 hrs, Volume= 0.029 af, Atten= 6%, Lag= 1.7 min
Discarded = 0.01 cfs @ 12.10 hrs, Volume= 0.005 af
Primary = 0.43 cfs @ 12.10 hrs, Volume= 0.024 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.01 hrs
Peak Elev= 101.78' @ 12.10 hrs Surf.Area= 371 sf Storage= 256 cf

Plug-Flow detention time= 111.0 min calculated for 0.029 af (89% of inflow)
Center-of-Mass det. time= 60.4 min (871.9 - 811.5)

Volume	Invert	Avail.Storage	Storage Description
#1	100.00'	345 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
100.00	5	0	0
101.00	121	63	63
101.30	219	51	114
102.00	440	231	345

Device	Routing	Invert	Outlet Devices
#1	Discarded	101.30'	**1.420 in/hr Exfiltration over Surface area above 101.30'** Conductivity to Groundwater Elevation = 0.00' Excluded Surface area = 219 sf
#2	Primary	101.60'	**2.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=0.01 cfs @ 12.10 hrs HW=101.78' (Free Discharge)
1=Exfiltration (Controls 0.01 cfs)

Primary OutFlow Max=0.43 cfs @ 12.10 hrs HW=101.78' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.43 cfs @ 1.19 fps)

APPENDIX G

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN

Prepared for

LEGACY 18 DEVELOPMENT INC.
4-UNIT CONDO BUILDING

5 & 9 ROMASCO LANE
Portland, Maine

January 2016

SME
Sevee & Maher Engineers, Inc.

ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

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

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POST-CONSTRUCTION STORMWATER MANAGEMENT PLAN
LEGACY 18 DEVELOPMENT INC.
4-UNIT CONDO BUILDING

1.0 SITE DESCRIPTION

David Klenicki (Owner) proposes to construct a 1,955-square-foot condo building on a 3,500 square foot parcel located at 5&9 Romasco Lane in Portland, Maine. The building will be a four-story, four-unit condo building with dedicated on-site parking in the garage located on the first floor. The property is located within the Residential 6 (R6) Zoning District and will comply with the City's vision of multifamily dwellings at a high density within this area.

The Owner intends to construct a four-story property to include; a garage on the first floor, two one-bedroom units on the second floor and two two-bedroom units on the other two floors.

The property is currently fully disturbed with an 880-square-foot paved parking area along the lane frontage and an overgrown lawn area to the rear of the property. There was a 650 square-foot building removed in July of 2015. The proposed building, paved vehicle maneuvering area, walks and patios will not result in an increase in developed area on the property, but will increase the on-site impervious area to approximately 2,100 square feet, an increase of 600 square feet.

2.0 CONTACTS

Facility:	4-Unit Condo Building 5 & 9 Romasco Lane Portland, Maine 04101
Owner Representative:	David Klenicki, President Legacy 18 Development Inc. 233 Smith Road Windham, ME 04062 Telephone: (917) 608-8814

Consultant/Designer: Sevee & Maher Engineers
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 SWP 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.

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 7 days, after the inspection identifying the problem. Each maintenance activity will be recorded on the attached 'Maintenance and Repair 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. Sediments within the infiltration basin shall be removed and the basin bottom repaired. Any areas around the infiltration basin found to have erosion should be corrected as necessary. Any bare areas should be seeded or sodded, as necessary. Inspect the area around the basin semi-annually for eroding soil and other sediment sources. Repair eroding areas using appropriate erosion control BMPs immediately. Control sediment sources, such as stockpiles of winter sand, by removing them from the basin's drainage area or surrounding them with sediment control BMP's. Prohibit vehicle access to all filtration areas, and limit pedestrian access into the basin. Heavy equipment used to maintain or rehabilitate the basins should work from the basin's perimeter.

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.

TABLE 1

LEGACY 18 DEVELOPMENT INC.
4-UNIT CONDO BUILDING

	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			
Infiltration Basins				
Inspect soil filter to see that collected water drains within 72 hours.	X	X	X	
Rototill top 3" soil, or remove and replace the top 3" of soil with clean soil to the proper specification, when the bed fails to drain dry within 72 hours.				X
Remove accumulated sediment, dead portions of plants, excessive growth, and weeds.		X		
Mow grass-covered filter bed no shorter than 6", at a frequency of no more than 2 times per growing season to maintain a high-grass meadow. Do not fertilize unless absolutely needed.	X	X		

The maintenance needs for most vegetative and stabilization measures may be found in the Maine Erosion and Sediment Control BMPs manual as published in 2003 (or latest version) and/or the Maine Stormwater Best Management Practices Manual.

LEGACY 18 DEVELOPMENT INC.

4-UNIT CONDO BUILDING INSPECTION LOG

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

LEGACY 18 DEVELOPMENT INC.

4-UNIT CONDO BUILDING MAINTENANCE LOG

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

APPENDIX H

CITY WASTEWATER CAPACITY APPLICATION

CITY OF PORTLAND WASTEWATER CAPACITY APPLICATION

Department of Public Services,
55 Portland Street,
Portland, Maine 04101-2991

Date: 10/21/2015

Mr. Frank J. Brancely,
Senior Engineering Technician,
Phone #: (207) 874-8832,
Fax #: (207) 874-8852,
E-mail:fjb@portlandmaine.gov

1. Please, Submit Utility, Site, and Locus Plans.

Site Address: 5&9 Romasco Lane, Portland, ME

Chart Block Lot Number: G10NE/16D/10

Proposed Use: Multi-Family Housing

Previous Use: Parking

Existing Sanitary Flows: 0 GPD

Existing Process Flows: 0 GPD

Description and location of City sewer that is to receive the proposed building sewer lateral.
18" line located in Saint Lawrence St. south of the lot.

Site Category

Commercial *(see part 4 below)*	
Industrial *(complete part 5 below)*	
Governmental	
Residential	X
Other *(specify)*	

(Clearly, indicate the proposed connections, on the submitted plans)

2. Please, Submit Contact Information.

City Planner's Name: _____ Phone: _____

Owner/Developer Name: Legacy 18 Development Inc.

Owner/Developer Address: 233 Smith Road, Windham, Me 04062

Phone: 917-608-8814 Fax: E-mail: kdsinc7@gmail.com

Engineering Consultant Name: Daniel P. Diffin, P.E.

Engineering Consultant Address: 4 Blanchard Rd, Cumberland, ME 04021

Phone: 207-829-5016 Fax: _____ E-mail: dpd@smemaine.com

(Note: Consultants and Developers should allow +/- 15 days, for capacity status, prior to Planning Board Review)

3. Please, Submit Domestic Wastewater Design Flow Calculations.

Estimated Domestic Wastewater Flow Generated: 630 GPD

Peaking Factor/ Peak Times: 6

Specify the source of design guidelines: *(i.e.* __ *"Handbook of Subsurface Wastewater Disposal in Maine,"* __ *"Plumbers and Pipe Fitters Calculation Manual,"* __ *Portland Water District Records,* X *Other (specify)*
TR-16

(Note: Please submit calculations showing the derivation of your design flows, either on the following page, in the space provided, or attached, as a separate sheet)

4. Please, Submit External Grease Interceptor Calculations.

Total Drainage Fixture Unit (DFU) Values: _____

Size of External Grease Interceptor: _____

Retention Time: _____

Peaking Factor/ Peak Times: _____

(Note: In determining your restaurant process water flows, and the size of your external grease interceptor, please use The Uniform Plumbing Code. Note: In determining the retention time, sixty (60) minutes is the minimum retention time. Note: Please submit detailed calculations showing the derivation of your restaurant process water design flows, and please submit detailed calculations showing the derivation of the size of your external grease interceptor, either in the space provided below, or attached, as a separate sheet)

5. Please, Submit Industrial Process Wastewater Flow Calculations

Estimated Industrial Process Wastewater Flows Generated: 0 GPD

Do you currently hold Federal or State discharge permits? Yes ____ No X

Is the process wastewater termed categorical under CFR 40? Yes ____ No X

OSHA Standard Industrial Code (SIC): *http://www.osha.gov/oshstats/sicser.html*

Peaking Factor/Peak Process Times: _____

(Note: On the submitted plans, please show where the building's domestic sanitary sewer laterals, as well as the building's industrial-commercial process wastewater sewer laterals exits the facility. Also, show where these building sewer laterals enter the city's sewer. Finally, show the location of the wet wells, control manholes, or other access points; and, the locations of filters, strainers, or grease traps)

(Note: Please submit detailed calculations showing the derivation of your design flows, either in the space provided below, or attached, as a separate sheet)

Notes, Comments or Calculation

Number of Bedrooms: 6
Daily Water Demand: 6 x 90 gallons/ day= 540 gallons/day
Peak Flow: 540 gallons/day x 6 = 3,240 gallons/ day □ 2.25 gal/min

APPENDIX I

PORTLAND WATER DISTRICT CAPACITY TO SERVE LETTER

Portland Water District
FROM SEBAGO LAKE TO CASCO BAY

November 19, 2015

Sevee & Maher Engineers, Inc.
4 Blanchard Road, P.O. Box 85A
Cumberland, ME 04021

Attn: Daniel Diffin
Re: 5 and 9 Romasco Lane - Portland
Ability to Serve with PWD Water

Dear Mr. Diffin:

The Portland Water District has received your request for an Ability to Serve Determination for the noted site submitted on October 22, 2015. Based on the information provided, we can confirm that the District will be able to serve the proposed project as further described in this letter.

Conditions of Service

The following conditions of service apply:

- It is the District's understanding that a four unit residential building with a NFPA 13R life safety sprinkler system is proposed at this location. The each of the two parcels are currently served with a ¾-inch domestic water service; the size of these services is undersized for the proposed use. Each service must be terminated by shutting the corporation valve and cutting the pipe from the water main.

- New fire and domestic services may be installed from the water main in Romasco Lane. The services should enter through the properties frontage at least 10-feet from side property lines. Please note that only one meter and one bill will be associated to each domestic service line. This one master meter must be located in a common space that all tenants could gain access to if necessary.

- Water District approval of water infrastructure plans will be required for the project prior to construction. As your project progresses, we advise that you submit any preliminary design plans to MEANS for review of the water main and water service line configuration. We will work with you to ensure that the design meets our current standards.

Existing Site Service

According to District records, the project site does currently have existing water service. Two 3/4-inch diameter copper water service lines, located as shown on the attached water service

225 DOUGLASS STREET P.O. BOX 3553 PORTLAND, MAINE 04104-3553
PHONE: 207.774.5961 FAX: 207.761.8307 WEB: WWW.PWD.ORG

cards, provide water service to this site. Please refer to the "Conditions of Service" section of this letter for requirements related to the use of these services.

Water System Characteristics

According to District records, there is an 8-inch diameter cast iron water main on the west side of Romasco Lane and a public fire hydrant located 75 feet from the site. Recent flow data is not available in this area. The most recent static pressure reading was 72 psi on 8/14/2015.

Public Fire Protection

This project will most likely not include the installation of new public hydrants to be accepted into the District water system. It is your responsibility to contact the Portland Fire Department to ensure that this project is adequately served by existing and/or proposed hydrants.

Domestic Water Needs

The data noted above indicates there should be adequate pressure and volume of water to serve the domestic water needs of your proposed project.

Private Fire Protection Water Needs

It is anticipated that this project will require water service to provide private fire protection to the site. Please note that the District does not guarantee any quantity of water or pressure through a fire protection service. Please share these results with your sprinkler system designer so that they can design the fire protection system to best fit the noted conditions. If the data is out of date or insufficient for their needs, please contact MEANS to request a hydrant flow test and we will work with you to get more complete data.

If the District can be of further assistance in this matter, please let us know.

Sincerely,
Portland Water District

Glissen Havu, E.I.
Design Engineer

5-9 Romasco Lane

Portland

PORTLAND WATER DISTRICT
225 Douglass Street
Portland, ME 04104

Scale 0 12.5 25 50 75 100 Feet — 1 inch = 50 feet

Legend

!	Air Valve	●	Connection	=	Combined Service	!	Manhole
5	Blow Off	!	Attribute Change	=	Domestic Service	(	CSO
R	By Pass	#	Reducer	=	Fire Service	→	Gravity
?	Distribution	!	Hydrant	(	Private Hydrants	→	Force
?	Transmission	?	Hydrant Control	(	Meter Pits		

Disclaimer: This map is suitable for preliminary study and analysis and is based on PWD record information. PWD is not liable for any damages whatsoever resulting from inaccurate data or from errors made in the location and marking of its infrastructure.

Drawn By: GJH	Prepared For: Sevee & Maher Engineers, Inc.
Scale: As Noted	Date: 11/19/2015

APPENDIX J

CONSTRUCTION MANAGEMENT PLAN

CONSTRUCTION MANAGEMENT PLAN
LEGACY 18 DEVELOPMENT INC.
4-UNIT CONDO BUILDING

BUILDING CONSRUCTION AND SITE DEVELOPMENT

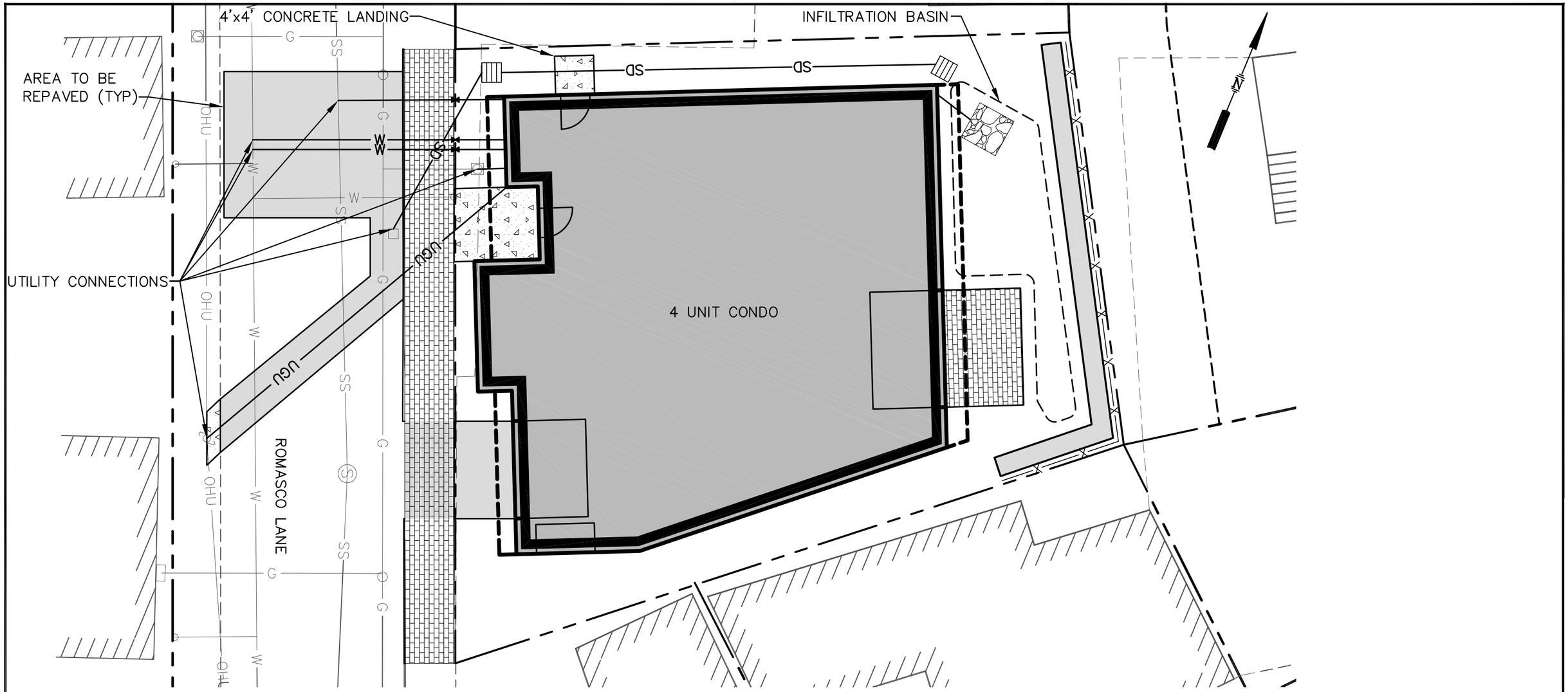
Development of the 4-unit condo building at 5 & 9 Romasco Lane (Project) will begin with the installation of erosion control measures including the stabilized construction entrance and sediment barriers. Erosion control measures will be inspected and maintained throughout the project. Materials required for construction will generally be stored off-site, however if necessary, on-site storage will be on the northeast end of the property, away from Romasco Lane.

Construction will begin with the demolition of the existing paved parking area and site grading. Waste materials from the demolition will be disposed of by the contractor. Pouring of the foundation and building construction will follow the demolition of the parking area. The utilities will then be connected to the building from the existing infrastructure.

Near the end of building construction, exterior site improvements will be completed. These site improvements include grading, installing walkways, constructing the infiltration basin, paving the maneuvering area and landscaping. Restoration of Romasco Lane pavement and sidewalk will be completed near the end of building construction to avoid damage from construction equipment on new pavement, curbing and sidewalk pavers.

TRAFFIC CONTROL

Certain components of the Project will affect traffic on Romasco Lane, primarily during utility tie-ins. The owner and contractor will coordinate road closures with the City of Portland. The construction of this Project is not anticipated to significantly increase traffic volumes of Romasco Lane. Pedestrian traffic will be directed to use the sidewalk on the opposite side of Romasco Lane to avoid the immediate area of the Project with appropriate signage and barriers.



ANTICIPATED CONSTRUCTION SEQUENCE:

1. INSTALL EROSION CONTROL MEASURES
2. DEMOLISH EXISTING PAVED PARKING AREA
3. ROUGH GRADE SITE
4. POUR FOUNDATION
5. CONSTRUCT BUILDING
6. COMPLETE UTILITY CONNECTIONS
7. COMPLETE EXTERNAL SITE IMPROVEMENTS (GRADING, WALKWAYS, INFILTRATION BASIN, PAVING AND LANDSCAPING)
8. RESTORE PAVEMENT AND SIDEWALK ON ROMASCO LANE

TRAFFIC CONTROL NOTES:

1. OWNER AND CONTRACTOR WILL COORDINATE ROAD CLOSURES WITH THE CITY OF PORTLAND.
2. PEDESTRIAN TRAFFIC WILL BE DIRECTED TO THE OPPOSITE SIDE OF ROMASCO LANE WITH APPROPRIATE SIGNAGE AND BARRIERS.
3. A DETAILED PLAN OF ROAD CLOSURES AND SIGNAGE FOR PEDESTRIAN ROUTING WILL BE PROVIDED DURING CONSTRUCTION PRIOR TO ANY ALTERATIONS TO VEHICULAR OR PEDESTRIAN TRAFFIC PATTERNS.

FIGURE 1
CONSTRUCTION MANAGEMENT PLAN
ROMASCO LANE
LEGACY 18 DEVELOPMENT, INC.
PORTLAND, MAINE

SME
Sevee & Maher Engineers, Inc.
ENVIRONMENTAL • CIVIL • GEOTECHNICAL • WATER • COMPLIANCE

DWG: BASE LMN: CMP CTB: SME-STD REV: 1/20/2016

\\Nserver\cfs\Klenicki Design\5 Romasco Lane\Acad\Plans\BASE.dwg, 1/20/2016 2:07:04 PM, jrl