ACORN ENGINEERING, INC.

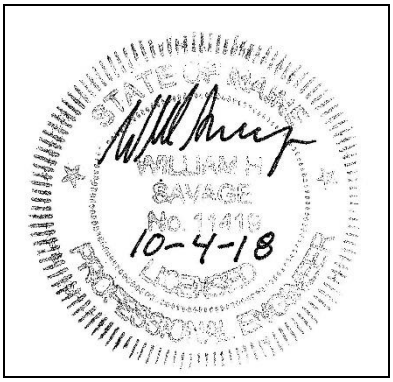
# K. STORMWATER MANAGEMENT REPORT

**Prepared For:**

**Akasha 155 LLC**
**PO Box 11546**
**Portland, Maine 04104**

**Prepared By:**

**Acorn Engineering, Inc.**
**158 Danforth Street**
**Portland, Maine 04102**




**October 2018**

ACORN ENGINEERING, INC.

## INTRODUCTION

Acorn Engineering, Inc. has been retained by Akasha 155 LLC to provide civil engineering services for the proposed redevelopment of 145 Washington Avenue. The proposed project includes the development of a 2-story building with a sauna/bathhouse on the first floor and residence on the second story.

A stormwater analysis has been prepared to demonstrate that the project will meet the following requirements of the City of Portland (the City):

- City of Portland Land Use Ordinance Chapter 14, Article V. Site Plan Section 14-523. Required Approvals and Applicability (E) Level II Site Plan Review.
- City of Portland Technical Manual – Section 5 – Portland Stormwater Management Standards and Maine DEP Chapter 500 Stormwater Management.

The proposed project is expected to decrease the impervious area by approximately 460 square feet. The increased landscaping and green roof will help retain and filter stormwater on site, reducing the demand on the City's combined sewer/storm system.

## EXISTING CONDITIONS

The proposed project site is located at 145 Washington Ave. A boundary plan has been prepared by R.W. Eaton Associates of Westbrook, Maine dated March 4, 2016.

The site is surrounded by residential uses and the R-6 zone except to the north where an outdoor gear shop exists within the B-1 zone. The majority (approximately 66%) of the site is impervious in the form of gravel or pavement.

The project team is not aware of the presence of any existing significant natural features located on the site. Given the urban setting, and existing impervious surfaces, a field inventory of significant natural feature was not undertaken. The project is not located within a watershed classified as an Urban Impaired Stream.

## PROPOSED DEVELOPMENT

The proposed project is a two-story building with a sauna/bathhouse on the ground level and a residence on the second story. Pedestrian access to the site will be provided off Washington Avenue. The development will be served by Portland Water District, Department of Public Works (sewer and storm), Unitil (natural gas), CMP (electric), Charter (cable), and Consolidated (telephone). All utilities will be routed underground.

Due to the reduction in impervious area, stormwater management features for quality control that

meets Maine DEP's Chapter 500 General Standards is not required and has not been designed. However, the green roof will provide some quality and quantity control.

Furthermore, the redeveloped non-roof impervious area has remained well under 5,000 square-feet. Please refer to the attached exhibits which outline the impervious covers.

In addition to the green roofs, stormwater will be managed by implementing a series of underdrains, infiltration trenches, field inlets, and storm drains. Please refer to Sheet C-30 for more information.

## SOILS

Onsite soil information includes the following:

- Soil Conservation Service Medium Intensity Soil Survey for Cumberland County
- United States Department of Agriculture Web Soil Survey

Given the soils information, listed above, no onsite wastewater is proposed; the applicant does not intend to perform a more intense hydric soil boundary delineation because the waiver requirements set forth in the City of Portland Technical Manual – Section 7 – Soil Survey, Rev. 6/17/11 are met.

The area within and surrounding the project includes soil types listed in the table below. The susceptibility of soils to erosion is indicated on a relative "K" scale of values over a range of 0.02 to 0.69. Higher "K" values indicate more erodible soils.

| Table 1 - "K" Value | | |
|---|---|---|
| **Soils Type** | **Subsurface** | **Substratum** |
| Hinckley Loamy Sand | 0.17 | 0.17 |

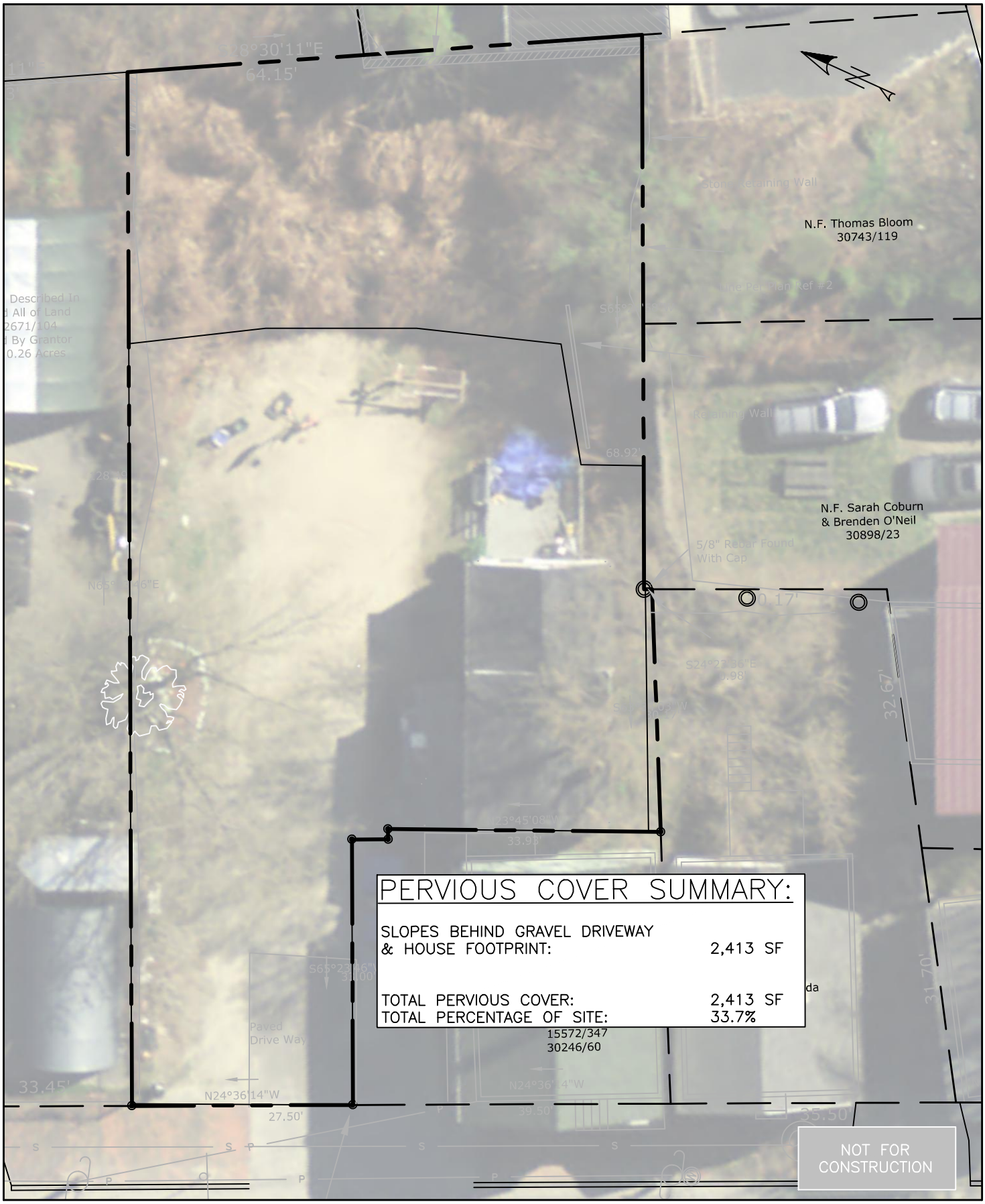
The soil "K" values for the soils, listed above, show a low susceptibility to erosion. The site's susceptibility to erosion is from the Soil Conservation Service Medium Intensity Soil Survey for Cumberland County. Although soil "K" values for the soils show a low susceptibility to erosion, implementation of the proposed Erosion & Sedimentation Measures by the contractor will be of the utmost importance given the sustained slope throughout the site.

## Conclusion

The proposed redevelopment was designed to meet the requirements set forth in the City of Portland Technical Manual – Section 5 – Portland Stormwater Management Standards. The proposed project as designed is anticipated to largely maintain existing drainage patterns while decreasing the overall volume and flowrate of stormwater runoff. The project will not cause flooding or erosion problems within the subject site, abutters' sites, nor within the right-of-way.

## Attachments

Attachment 1: Existing Impervious Cover
Attachment 2: Proposed Impervious Cover
Attachment 3: Soils Report






DRAWING NO.
EX-1

| | |
|---|---|
| FILE: | 1108_CIVIL |
| DATE: | 9/26/18 |
| JN: | 1108 |
| SCALE: | 1"=16' |
| DESIGN BY: | SJL |
| DRAWN BY: | SJL |
| CHECKED BY: | WHS |

ACORN ENGINEERING, INC
ACORN ENGINEERING, INC. P.O. BOX 3372
PORTLAND, MAINE 04104 (207) 775-2655

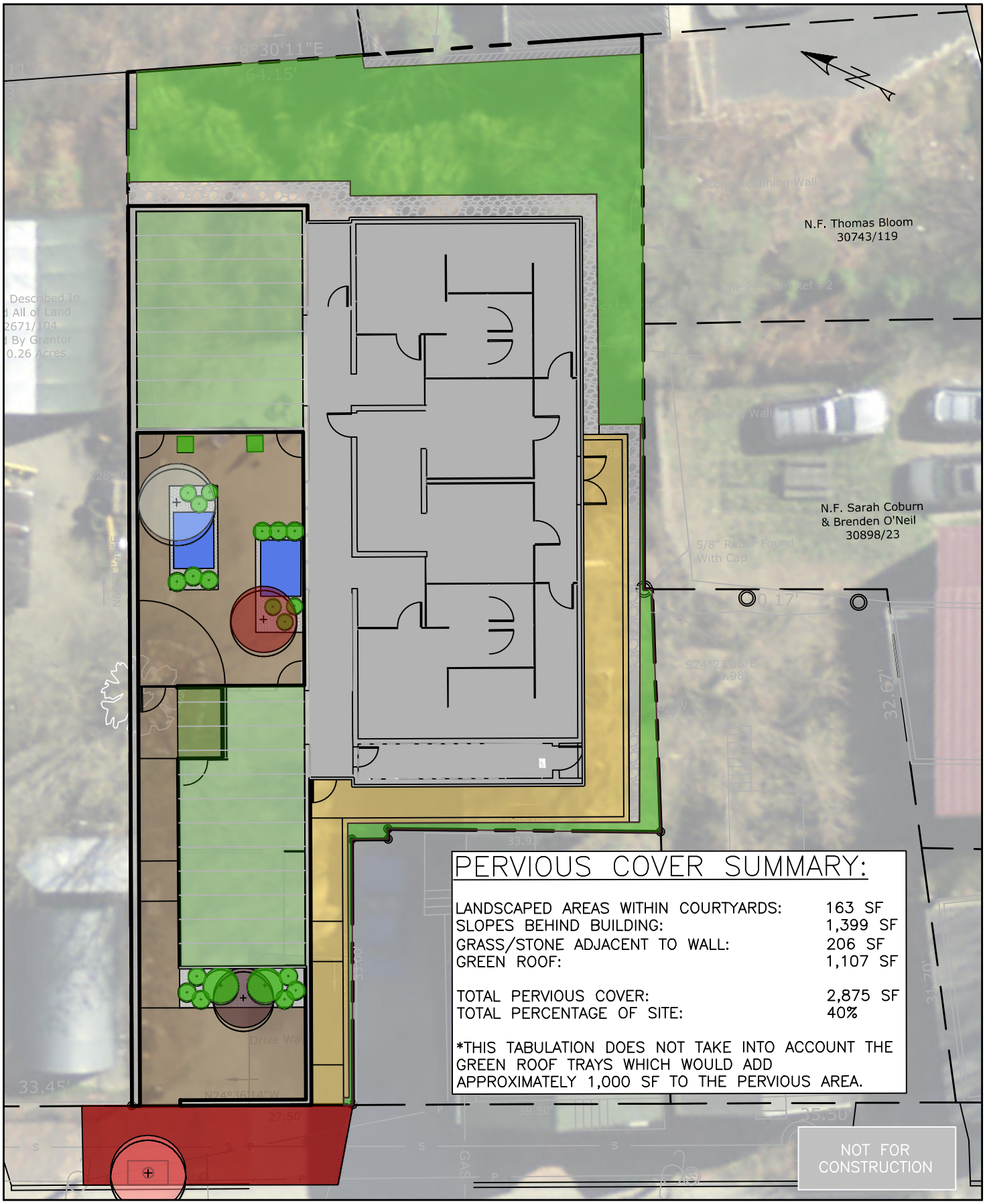
DRAWING NAME:
EXISTING IMPERVIOUS COVER

PROJECT NAME:
145 WASHINGTON AVE BATHS

CLIENT:
AKASHA 155 LCC

| ISSUED FOR | BY | DATE |
|---|---|---|
| FINAL APP. | WHS | 9/26/18 |

REV. DATE




## PERVIOUS COVER SUMMARY:

| | |
|---|---|
| LANDSCAPED AREAS WITHIN COURTYARDS: | 163 SF |
| SLOPES BEHIND BUILDING: | 1,399 SF |
| GRASS/STONE ADJACENT TO WALL: | 206 SF |
| GREEN ROOF: | 1,107 SF |
| TOTAL PERVIOUS COVER: | 2,875 SF |
| TOTAL PERCENTAGE OF SITE: | 40% |

*THIS TABULATION DOES NOT TAKE INTO ACCOUNT THE GREEN ROOF TRAYS WHICH WOULD ADD APPROXIMATELY 1,000 SF TO THE PERVIOUS AREA.

NOT FOR CONSTRUCTION



DRAWING NO.
EX-2

| | |
|---|---|
| FILE: | 1108_CIVIL |
| DATE: | 9/26/18 |
| JN: | 1108 |
| SCALE: | 1"=16' |
| DESIGN BY: | SJL |
| DRAWN BY: | SJL |
| CHECKED BY: | WHS |

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DRAWING NAME:
PROPOSED IMPERVIOUS COVER

PROJECT NAME:
145 WASHINGTON AVE BATHS

CLIENT:
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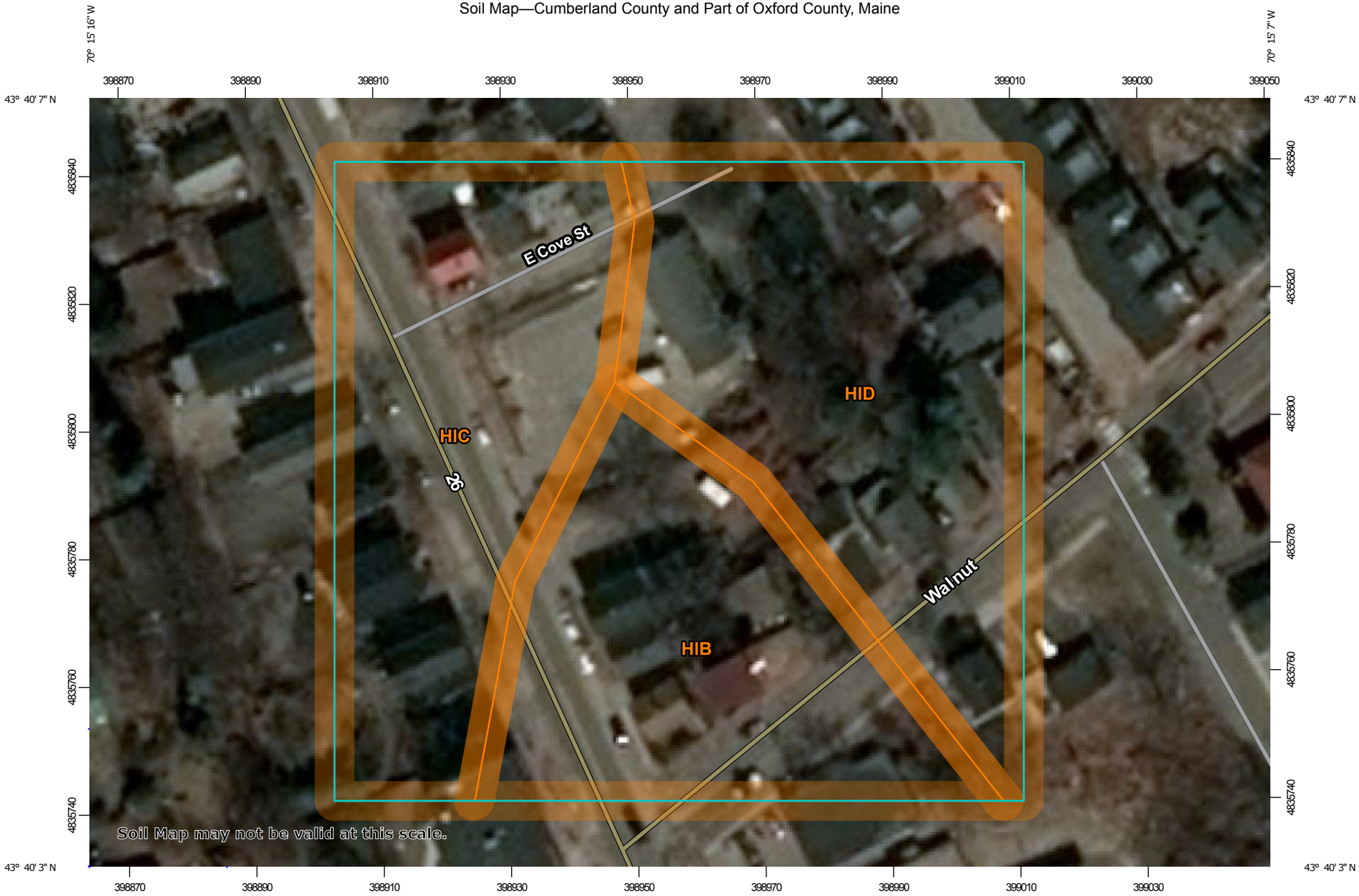


Map Scale: 1:848 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 40 80 160 240

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

## MAP LEGEND

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

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

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

**Water Features**
- Streams and Canals

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

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 15, Sep 6, 2018

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

Date(s) aerial images were photographed: Data not available.

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

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| HIB | Hinckley loamy sand, 3 to 8 percent slopes | 0.8 | 28.9% |
| HIC | Hinckley loamy sand, 8 to 15 percent slopes | 0.9 | 33.0% |
| HID | Hinckley loamy sand, 15 to 25 percent slopes | 1.0 | 38.1% |
| **Totals for Area of Interest** | | **2.7** | **100.0%** |