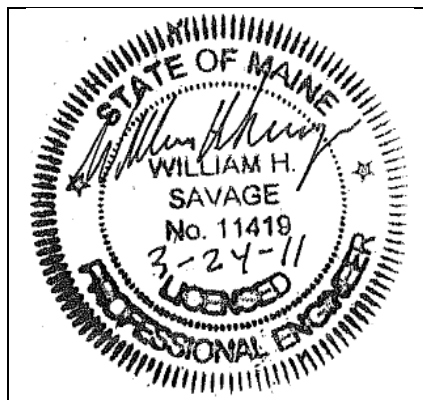


# PRELIMINARY STORMWATER REPORT

Prepared For:  
**Harborview Development, LLC**  
**P.O. Box 8816**  
**Portland, Maine 04104**

Prepared By:  
**Acorn Engineering, Inc.**  
**154 York Street, Suite 2**  
**Portland, Maine 04101**



March 2011

## **PROJECT SITE**

On behalf of Harborview Development, LLC Acorn Engineering is pleased to submit the following summary of our stormwater analysis and findings for the proposed development. The subject property is located at 121-129 York Street or Portland Tax Chart 044, Block A, Lots 4 & 5.

The proposed project anticipates less than one acre of disturbed and less than one acre of impervious area within a watershed not classified as an Urban Impaired Stream. A project of this size does not require a Maine Construction General Permit (MCGP) or a Stormwater Permit from the Maine Department of Environmental Protection. However a Tier-III Site Plan must be in compliance with the City of Portland's MS4 permit obligations. The City has elected to meet their permit obligations by applying the more restrictive Basic, General, and Flooding Standard as defined by the Maine DEP Chapter 500 Stormwater Management Rules. Simply stated the development shall address the post development effects on both the quantity and quality of the stormwater runoff.

The following Stormwater Report was developed in accordance with the City of Portland Technical Manual – Section 5 – Portland Stormwater Management Standards and Maine DEP Chapter 500 Stormwater Management.

## **EXISTING CONDITIONS**

The development site is comprised of two separate parcels described as Lot 4 and 5 per the City Chart, Block and Lot numbers. Lot 4 consists of 14,117 square feet (0.32 acre) and Lot 5 consists of 7,112 square feet (0.16 acre) of land area. On Lot 5 there is an existing three story brick apartment building. Lot 4 contains an existing gravel parking lot which has historically served the tenants of the adjacent apartment building. An existing conditions plan has been prepared by Ocean Park Land Surveying, LLC of Old Orchard Beach, Maine.

Currently the site drains towards York Street before entering the municipal storm drainage system. Lot 5 is covered with approximately 50% of the site being the existing building and 50% lawn. Drainage from the existing building roof sheet flows off the drip edge. Lot 4 is covered with approximately 30% of the site being the existing gravel parking field and 70% being a combination of poor quality grass/brush intermingled with old construction debris. The majority of the slopes on the two properties range between 7% to 11% and slopes easterly towards York Street. The condition of the existing gravel parking field is in relatively marginal condition most likely due to the fact that that over time the stormwater from the upper lot flowing over the moderate slopes in combination with the vehicular traffic during storm events have lead to the fine particles being washed away into York Street. The proposed redevelopment shall address this existing erosion and sedimentation control issue.

The developer is not aware the presence of any existing significant natural features located on the site as listed in Section 14-526 (b) 1. of the Land Use Code.

## **PROPOSED DEVELOPMENT**

The proposed project anticipates the conversion of the existing 12-unit brick building on Lot 5 from apartments into condominium units and the infill development of a new 4,000 sf building providing an additional 7 condominium units on Lot 4. On Lot 5 there will be minimal changes to the existing site with the exception of an outdoor patio. On Lot 4 the building shall be surrounded with extensive landscaping treatments and architectural elements. The existing gravel parking lot shall be redeveloped to serve the development. The parking lot will be regraded and permanently stabilized with pavement. The project anticipates incorporating the Maine DEP approved underdrained subsurface sand filter (USSF) BMP to meet the General and Flooding Standard.

## **SOILS**

Soils on the site were based upon the Soil Conservation Service Medium Intensity Soil Survey for Cumberland County. The area of the development is mapped with soils as shown in the table below. For clarity, a soils map has been attached to this report in Attachment C. The susceptibility of soils to erosion are indicated on a relative “K” scale of values over a range of 0.02 to 0.69. Higher “K” values indicate more erodible soils. The following table lists the “K” values for the soils onsite:

<b>Table 2 - “K” Value</b>		
<b>Type</b>	<b>Subsurface</b>	<b>Substratum</b>
Hinckley Gravelly Sandy Loam	0.17	0.17

The soil “K” values listed above show the onsite soils have low susceptibility to erosion.

## **GENERAL STANDARDS - WATER QUALITY**

The underdrained subsurface sand filter BMP (USSF) was sized to meet the requirements set forth within the MDEP Volume III: BMP’s Technical Design Manual Section 7.3. The development shall provide water quality treatment for no less than 95% of the new impervious area and 80% of the developed area. The project shall redevelop the existing impervious area comprised of the gravel parking into the proposed asphalt parking lot. The treatment of the impervious surface is as follows:

- Existing Impervious = 8,100 sf
- Proposed Impervious = 14,650 sf
- Net Impervious = 6,550 sf
- Required Treatment @ 95% = 6,223 sf
  
- Proposed Treatment = 9,300 sf

As shown above the project anticipates meeting and exceeding the required treatment for new impervious surfaces through the use of the underdrained subsurface sand filter BMP.

Additionally the StormTech Isolator Row shall be sized to accommodate 0.2 cfs for each SC-740 based upon the one year peak flow rate.

In accordance with the Volume III: BMPs Technical Design Manual, a treatment volume of 1.0 inches times the tributary impervious area plus 0.4 inches times the tributary disturbed area is required to be treated by the USSF. The treatment volume is calculated by the following formula:

$$\left( \frac{\text{Imp. SF} \times 1.0''}{12''/1'} \right) + \left( \frac{\text{Veg. SF} \times 0.4''}{12''/1'} \right) = \text{Treatment Volume (CF)}$$

Once the treatment volume is known an artificial rainfall event is created within HydroCAD, to mimic a storm event which equals the treatment volume. Additionally a water quality outlet is modeled to provide the required minimum 24-hour release time. The outlet for the water quality volume is then set above the peak elevation determined for the “treatment volume rainfall event”.

### **FLOODING STANDARD – WATER QUANTITY**

The proposed developments shall be modeled with HydroCAD to verify that the post-development does not exceed the pre-development conditions. A 24-hour SCS Type III storm distribution for the 2, 10, and 25 – year storm events were used. The corresponding rainfall amounts for these storms are 3.00”, 4.70”, and 5.50” respectively. Based on a Soil Conservation Service Medium Intensity Soil Survey for Cumberland County, modeling assumptions included primarily hydrologic soil groups (HSG) A.

Due to the numerous variables, and inherent inaccuracies with the modeling program used to calculate stormwater runoff it is custom at Acorn Engineering, Inc. to round to the nearest whole number. However due to the small size of the project the stormwater runoff shall be rounded to the nearest tenth of a cubic feet per second (cfs). Given the relatively small watershed areas and urban setting a 5 minute time of concentration was applied to each subcatchment for both the pre and post-development conditions.

#### *Pre-development Calculations*

The pre-development condition was modeled as one subcatchment with one point of interest (POI#1) located at the approximate location of the existing driveway apron adjacent to York Street. A Pre-development Watershed Map developed for this project can be viewed in Attachment A, and a copy of the HydroCAD calculations is included within Attachment D, or this report. Peak flow rates for the storm events are as follows:

<b>Table 1 – Pre-Development Stormwater Flows</b>			
<b>Drainage Area</b>	<b>2 – Year Storm Event (cfs)</b>	<b>10 – Year Storm Event (cfs)</b>	<b>25 – Year Storm Event (cfs)</b>
<b>POI #1</b>	0.2	0.8	1.1



*Post-development Calculations:*

The one predevelopment subcatchment was broken into three separate subcatchments for the post-development condition.

- Subcatchment 1 – This is the only subcatchment not tributary to the USSF. Outside of the redeveloped parking lot there is relatively little change in land use.
- Subcatchment 2 – Characterized as the subcatchment comprised of the redeveloped parking lot tributary to the USSF.
- Subcatchment 3 – Stormwater from proposed building, walkways, and landscaped areas shall be directed through the foundation drain to the USSF. The relatively flat under drain along the building southern exposure was modeled as a pond verify the size of the under drain and to account for the limited detention characteristics.

Subcatchments 2 and 3 were over detained within the USSF to compensate for any increased stormwater flows from Subcatchment 1. The stormwater design as currently envisioned promotes infiltration into the surrounding soil through the use of perforated pipes and the USSF BMP. A conservative exfiltration rate of 2.41 in./hr. applied to only the surface area was used when modeling Pond 1 and 2.

The post development calculations include changes to the land use, and the proposed detention facility. The following table represents comparison of predevelopment and post-development condition peak runoff rates at point of interest 1 (POI #1) at the approximate location of the existing driveway apron adjacent to York Street.

<b>Table 2 – Comparison of Peak Flows</b>						
<b>Drainage Area</b>	<b>2 – Year Storm Event (cfs)</b>		<b>10 – Year Storm Event (cfs)</b>		<b>100 – Year Storm Event (cfs)</b>	
	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>	<b>Pre</b>	<b>Post</b>
<b>POI #1</b>	.2	.2	0.8	.6	1.1	0.8

As shown within Table 2 the post development peak flows shall remain at or below the predevelopment levels. A Post-development Watershed Map developed for this project can be viewed in Attachment A, and a copy of the HydroCAD calculations is included within Attachment D, of this report.

**Conclusion**

The proposed development was designed to meet the requirements implemented by the MDEP under the Stormwater Management Statute (38 M.R.S.A. § 420-D) as well as the City of Portland Technical Manual – Section 5 – Portland Stormwater Management Standards. As a result the design of the proposed development and stormwater system does not anticipate to create erosion, drainage or runoff problems either in the development or with respect to adjoining properties.

## **Attachments**

Attachment A: Pre Development Watershed Map

Attachment B: Post Development Watershed Map

Attachment C: Soils Map

Attachment D: HydroCAD Calculations

Attachment E: Operation and Maintenance Plan - Not Included with Prelim. Application

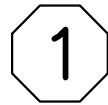
# **Attachment A**

## **Predevelopment Watershed Map**

NOTES:

1. GIVEN THE RELATIVELY SMALL WATERSHED AREAS AND URBAN SETTING A TIME OF CONCENTRATION OF 5 MINUTES WAS USED.

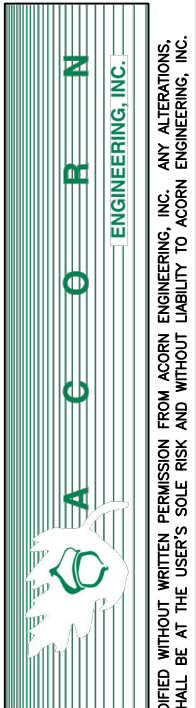
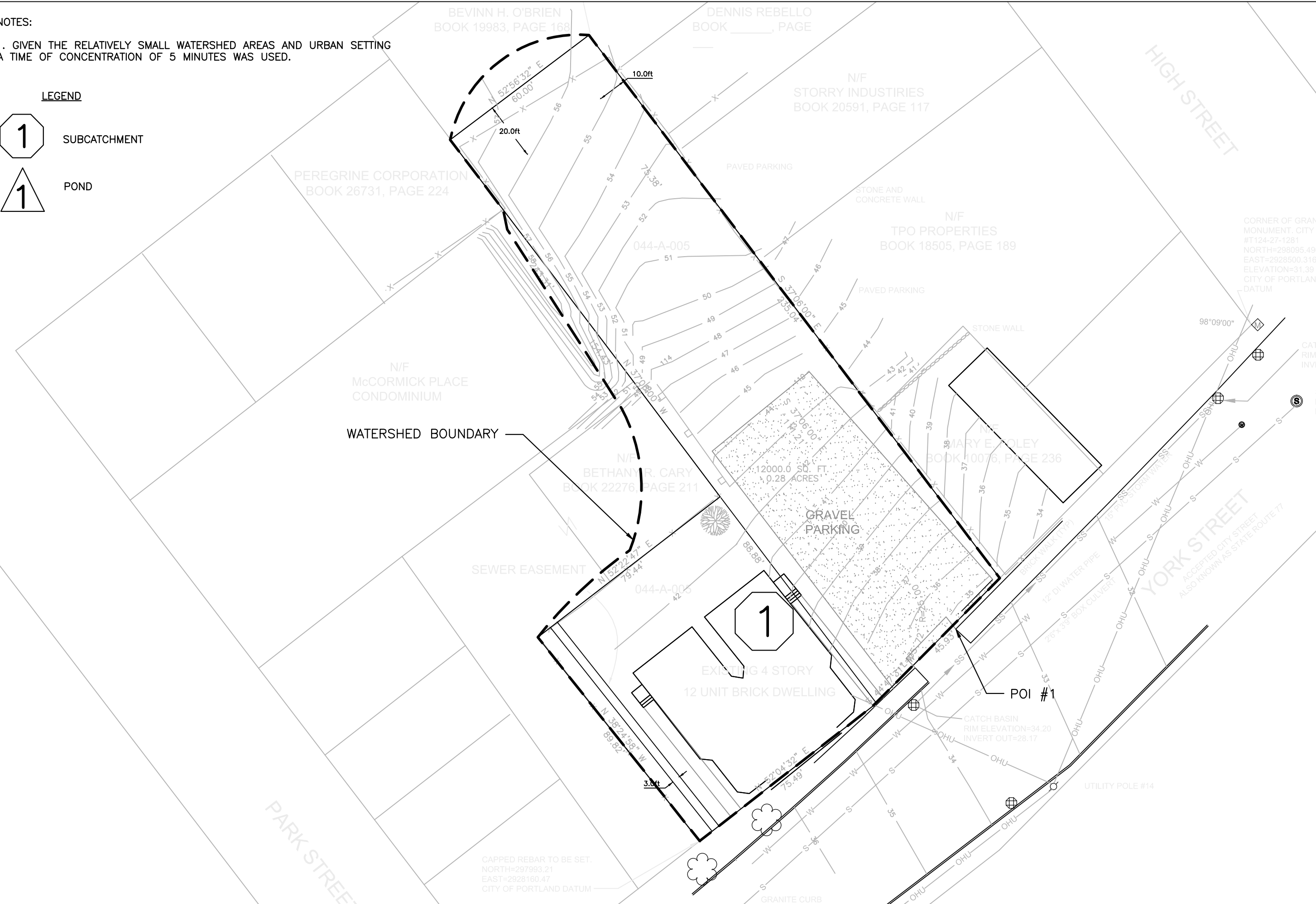
LEGEND



SUBCATCHMENT



POND



**PRE-DEVELOPMENT WATERSHED**  
**HARBORVIEW DEVELOPMENT, LLC**

TITLE: PRE-DEVELOPMENT WATERSHED  
 PROJECT NAME: HARBORVIEW DEVELOPMENT, LLC  
 ISSUED FOR: PERMITTING

JOB #: 1035  
 DATE: 3-24-11  
 DWN BY: WHS  
 SCALE: 1"=30'  
 SHEET #: 1

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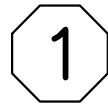
## **Attachment B**

### **Post Development Watershed Map**

NOTES:

1. GIVEN THE RELATIVELY SMALL WATERSHED AREAS AND URBAN SETTING A TIME OF CONCENTRATION OF 5 MINUTES WAS USED.

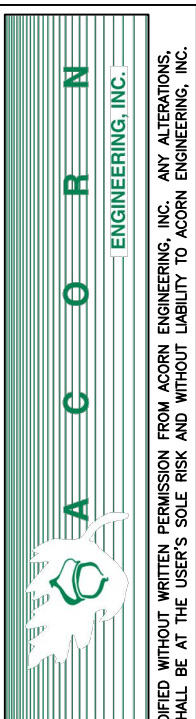
LEGEND



SUBCATCHMENT



POND



<p>TITLE: <b>POST-DEVELOPMENT WATERSHED</b></p>	
<p>PROJECT NAME: <b>HARBORVIEW DEVELOPMENT, LLC</b></p>	
<p>ISSUED FOR: <b>PERMITTING</b></p>	
JOB #:	<b>1035</b>
DATE:	<b>3-24-11</b>
DWN BY:	<b>WHS</b>
SCALE:	<b>1"=30'</b>
SHEET #:	<b>2</b>

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# **Attachment C**

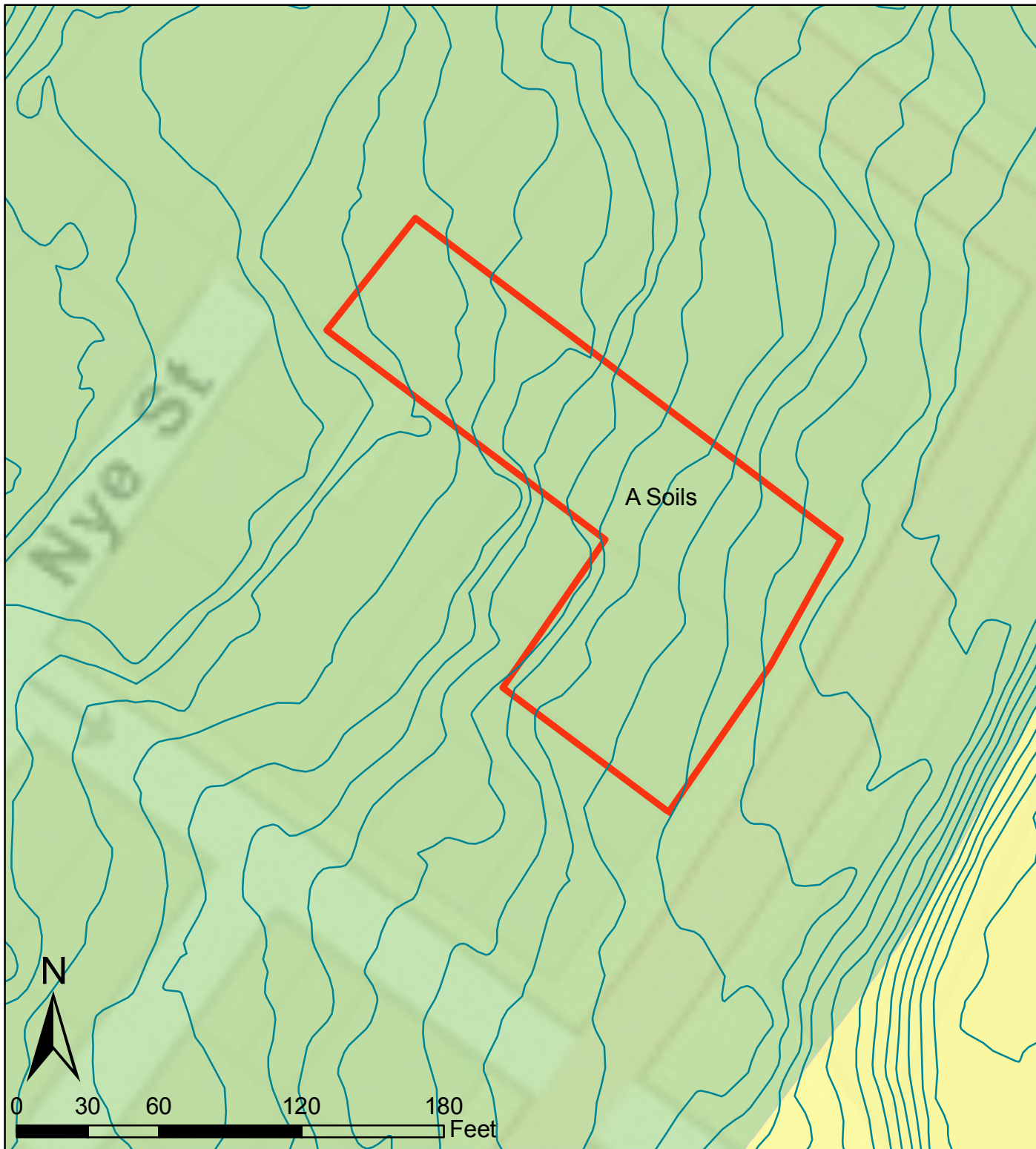
## **Soils Map**



# ATTACHMENT C

## SOIL CLASSIFICATION

### MAP



### Legend

- contours\_2ft
- Property Line

#### CUMBERLAND SOILS

- Water

#### Soil Groups

- A
- B
- C
- C/D
- D