

HYDRAULIC ANALYSIS AND STORMWATER DESIGN
CALCULATIONS

Prepared for
Feliz-Obrig Residence
257 Piermont Ave
South Nyack, NY 10960
66.62-2-36

VILLAGE OF SOUTH NYACK
TOWN OF ORANGETOWN
ROCKLAND COUNTY, NEW YORK

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Mahwah, NJ 07430

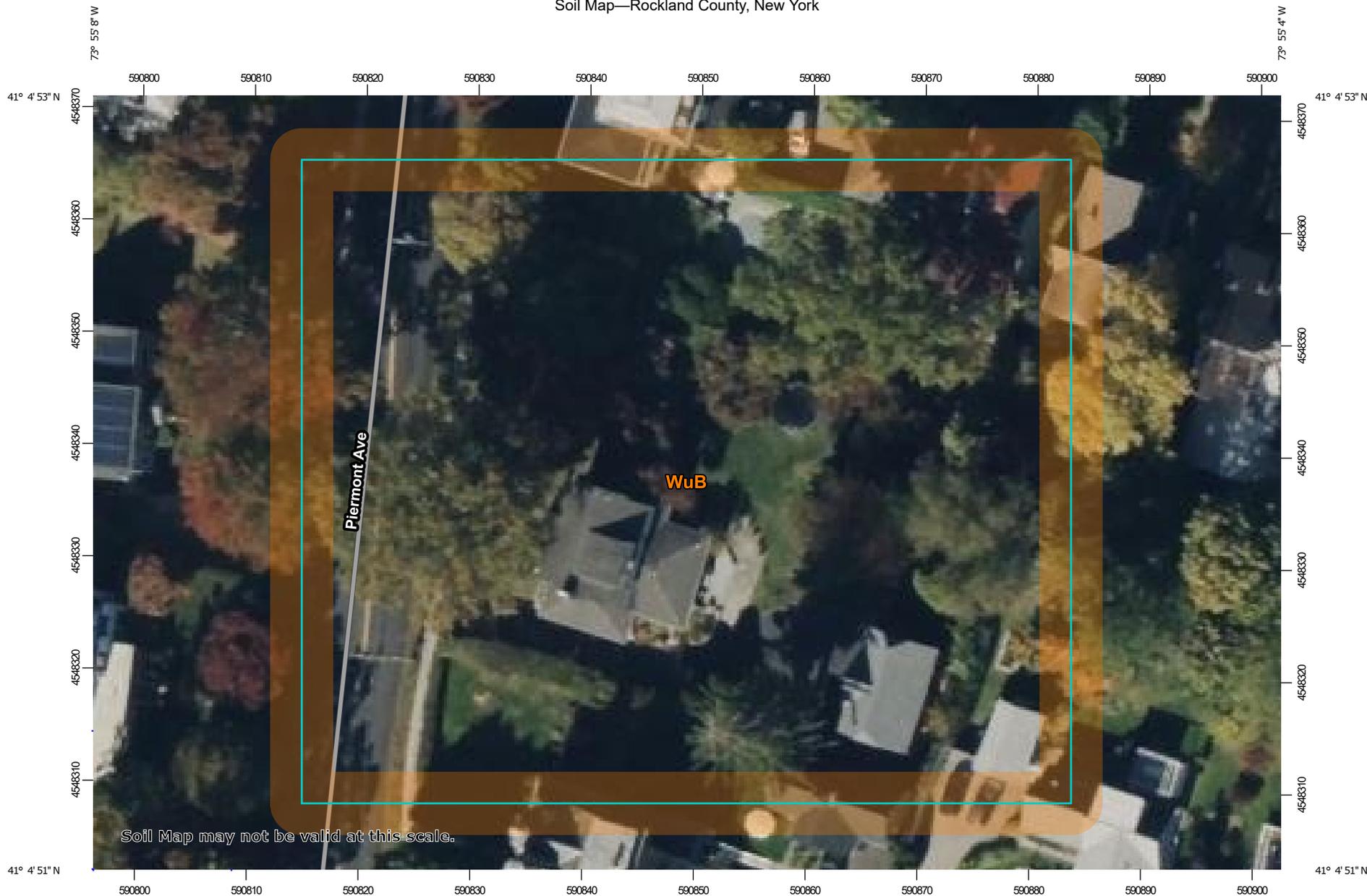
Paul Gdanski

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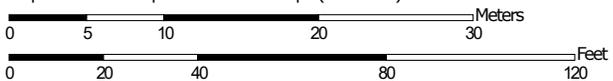
DATE: January 9, 2025
REV: June 4, 2025
REV: June 9, 2025
REV: June 11, 2025
REV: July 2, 2025



Soil Map—Rockland County, New York



Map Scale: 1:486 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N 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: Rockland County, New York

Survey Area Data: Version 22, Aug 25, 2024

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

Date(s) aerial images were photographed: Oct 21, 2022—Oct 27, 2022

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
WuB	Wethersfield-Urban land complex, 2 to 8 percent slopes	1.0	100.0%
Totals for Area of Interest		1.0	100.0%

Rockland County, New York

WuB—Wethersfield-Urban land complex, 2 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9v5p

Elevation: 0 to 710 feet

Mean annual precipitation: 47 to 50 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 135 to 215 days

Farmland classification: Not prime farmland

Map Unit Composition

Wethersfield and similar soils: 50 percent

Urban land: 25 percent

Minor components: 25 percent

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

Description of Wethersfield

Setting

Landform: Hills, till plains

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Crest

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Loamy acid till derived mainly from reddish sandstone, shale, and conglomerate, with some basalt

Typical profile

H1 - 0 to 13 inches: gravelly silt loam

H2 - 13 to 22 inches: gravelly loam

H3 - 22 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 2 to 8 percent

Depth to restrictive feature: 20 to 38 inches to densic material

Drainage class: Well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Ecological site: F145XY012CT - Well Drained Dense Till Uplands

Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: variable

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

Minor Components

Charlton

Percent of map unit: 5 percent

Hydric soil rating: No

Cheshire

Percent of map unit: 5 percent

Hydric soil rating: No

Riverhead

Percent of map unit: 5 percent

Hydric soil rating: No

Udorthents

Percent of map unit: 5 percent

Hydric soil rating: No

Wallington

Percent of map unit: 5 percent

Hydric soil rating: No

Data Source Information

Soil Survey Area: Rockland County, New York

Survey Area Data: Version 22, Aug 25, 2024

Project Location

The subject site, a 0.3667 acre (15,972.09 SF) parcel, located at 257 Piermont Avenue, on the eastern side, 200 feet north of the intersection with Washington Avenue, in the Village of South Nyack, Town of Orangetown, Rockland County, New York.

Pre-Development Conditions

The existing parcel is moderately sloped, with the site running downhill from the south of the property north towards Gesner Avenue. All of the site drains gradually towards the northern property as overland flow. The area to be disturbed is currently comprised of existing grass.

Project Type

This proposed project is to construct a new addition (447 sf). The designer is required to provide water quantity volume mitigation as a result of additional impervious surface area above the total area existing at the site. The type of facility or practice chosen to provide mitigation is perforated pipe.

Project Scope

The project involves the construction of a addition and removal of a slate patio. The total area to be disturbed is approximately 5,800 square feet, or 0.13 acres. The disturbed area is comprised of existing grassy areas. The overall increase in impervious surfaces requiring mitigation is therefore $447 \text{ sf}(\text{addition}) - 282 \text{ sf}(\text{patio tbr}) = 165 \text{ sf}$.

Soils

The USDA/NRCS soil survey for Rockland County shows the soils in the Project Site are Wethersfield urban land complex (WuB) soils. These soils are of the Hydrologic Soil Group C. Depth to groundwater will be tested for at the location of the proposed facility.

Hydraulic and Hydrologic Analyses

The analysis utilized for quantifying stormwater runoff rates and volumes was TR-55 and the Westchester Method. The 100-year frequency rainfall was analyzed.

- Computation of required volume utilizing Tr-55

- Dimensions, material specifications and installation details for each post-construction stormwater control practice.

Based on the calculations shown within the appendix, sufficient storage has been provided an infiltration rate of at least 10":60 minutes. Testing data is provided at the end of the report. A 10'x9' infiltration trench has been proposed to achieve the required storage. The required storage is 41 CF. Utilizing the perforated pipe, we provide 54.0 CF without taking into account the infiltration.

Infiltration Trench Design:

Wethersfield "C"

Development size = 0.0038 Acre
Undeveloped SCS Curve No.= 74.0000
Developed SCS Curve No.= 98.0000

1. Select Design Storm

100 year, 24-hour

2. Type of subsurface disposal system:

Infiltration trench I-1

3. Determine Percolation Rate:

Percolation Rate:

Drop 10.0000 inches
Time 60.0000 minutes

a. Area of Percolation (A_p):

Surface area of Cylinder

$A_c = \pi * D * h_{avg}$

$D = 1.0000$ foot

$h_{avg} = 8.5000$ inches

$A_c = 2.2253$ Ft²

Bottom Area

$A_b = \pi * r^2$

$A_b = 0.7854$ Ft²

Volume of Percolation:

$A_p = A_b$

$A_p = 0.7854$ Ft²

$V_p = A_b * h = 0.6545$ Ft³

Soil Percolation Rate

$S_r = \text{volume/area/time} = 0.0139$ Ft³/Ft²/Min.

$S_r = 20.0000$ Ft³/Ft²/day

$S_r = (\text{minus clogging factor of 25\%}) = 15.0000$ Ft³/Ft²/day

4. Calculate Required Storage Volume:

100yr, 24 hour rainfall= 9.3000 inches

From Table 2-1 of TR-55

Existing CN= 74.0000 therefore depth $V_r = 6.11$ Inches

Proposed CN= 98.0000 therefore depth $V_r = 9.10$ Inches

$\Delta V_r = 2.9900$ Inches

$V_s = \Delta V_r * \text{Area}$

$V_s = 41.1125$ Ft³

5. Surface Area of infiltration trench

$A_t = WQ_v / \phi * dt$

$WQ_v = 41.1125$ Ft³

$\phi = (\text{porosity}) = 0.4000$

$dt = (\text{depth of trench}) = 1.5000$ feet

$A_t = 68.5208$ Ft²

Width= 10.0000 Ft

Length= 9.0000 Ft

Drawn Down Time:

Infiltration Rate 0.1667 In/hr 0.01 Ft/hr

Volume to be Infiltrated 41.1000 CF

Area of Infiltration 90.0000 SF

Time to drain 32.8800 hours <48 hours Ok



FAIRWAY TESTING

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Telephone 845.942.2088
Fax 845.942.0995

Report Date: 4/22/2025
Project: 257 Piermont Avenue
Location: Nyack, NY

Client: Brad Felix
REPORT: Percolation Test Results

On April 17th and April 18th, a representative from this firm visited the project site to conduct percolation testing at the above-mentioned site. See attached map for test hole location. The test hole was excavated to approximately 2' below existing grade. No groundwater was present at this elevation. The area was excavated an additional 5', to a total of 7' below existing grade. There was groundwater encountered at the 7' depth.

On April 17th, at an elevation of 2', a percolation test hole was dug approximately 24" in depth. A 4" PVC casing 30" long was inserted into the hole. No groundwater was present at that depth prior to the insertion of the PVC casing pipe. The sleeve was filled with water and allowed to drain overnight.

On April 18th, a representative visited the project site and percolation testing was then conducted at the test hole. The casing was filled full to 24-inch height and timing for 60 minutes was started. The casing was refilled full to the 24-inch height and the process was repeated three more times. See attached report for percolation test results and location. Photo of test location also attached.

Respectfully Submitted,
Fairway Testing

Patsy J. Aguanno, P.E.

