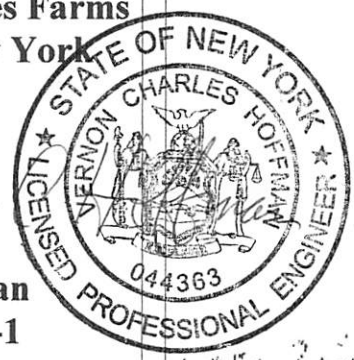
GEOTECHNICAL REPORT

For: WINSTON FARM DEVELOPMENT, SAUGERTIES, NEW YORK

File Number: 6526

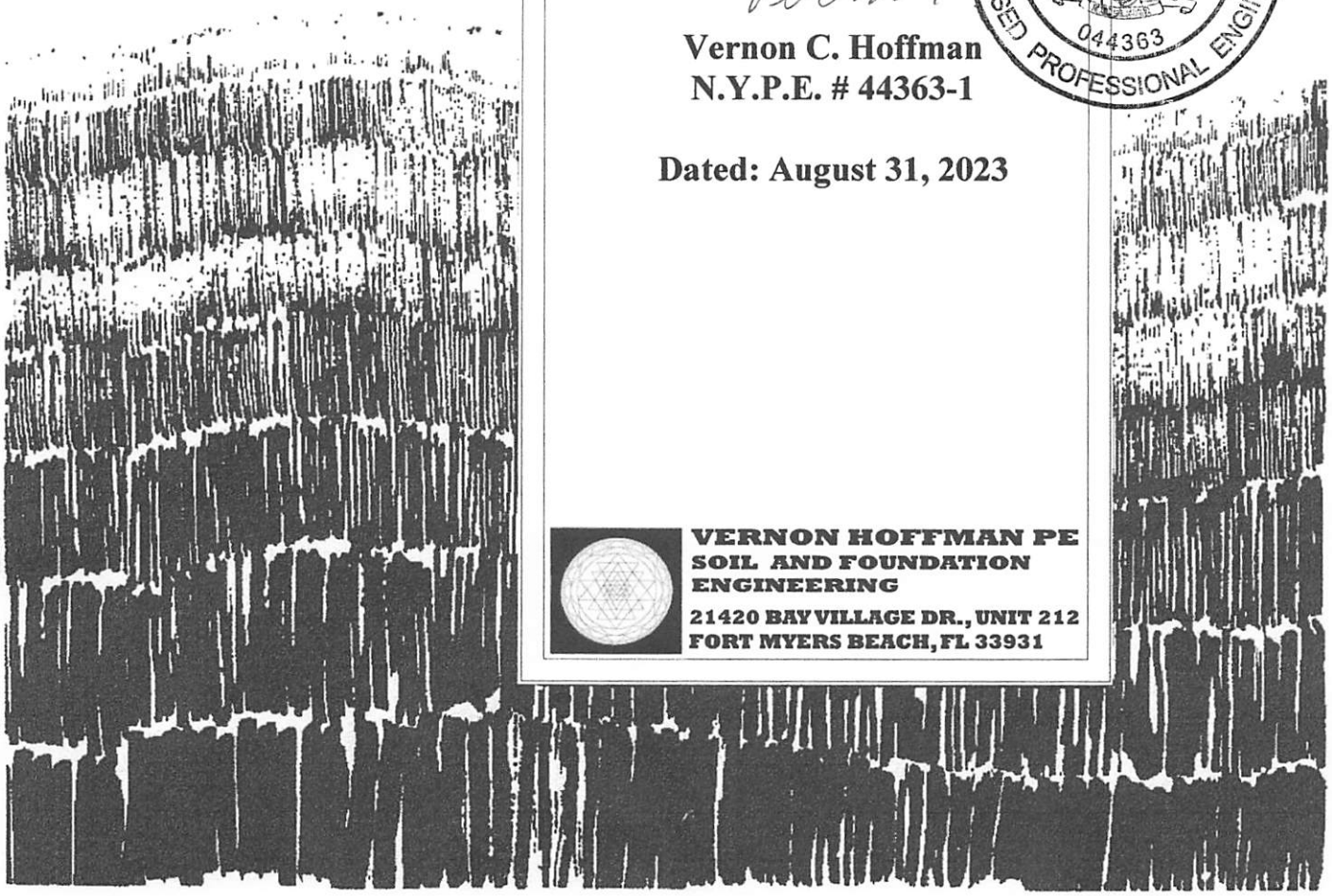
Prepared for: Saugerties Farms LLC, Saugerties, New York

Prepared by:



Vernon C. Hoffman
N.Y.P.E. # 44363-1

Dated: August 31, 2023



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INTRODUCTION:

The supplementary subsurface investigation for the proposed Winston Farm Development on State Route 32, Saugerties, New York, has been completed. Twenty-three (23) test pits have been excavated by J. Mullen and Sons, Inc., of Saugerties, New York, and logged by the geotechnical engineer. The logs of these test pits, along with location plans, have been included in the appendix of this report. The proposed construction will be a development which will include a variety of Areas or sections each dedicated to a special use such as a Hotel and Conference Center, a Commercial area, an Auditorium, Multifamily Housing, and Single Family Lots with access roadways and appurtenant structures. The proposed Concept Site plan has been includeded in the appendix.

This preliminary subsurface investigation has been done to provide information to be used to refine the existing development plan and to provide preliminary information for the developers of the particular projects that will occupy each of the use zones. It is my understanding that the preliminary development plan might be revised extensively. I have made use the soil information from the USDA Custom Soil Resource Report for Ulster County, New York, as a base map for the investigation. I have structured the preliminary investigation as follows: The primarily forested western part of the 840 Acre parcel has not been investigated. That area of primarily forested land (Sub-Areas 1 & 4) has extensive areas with shallow bedrock as delineated in the USDA web survey maps. The preliminary Concept Development plan shows parcels there for single family lots, cabins, and other light development.

The eastern part of The Winston Farm Development which has been extensively farmed in the past (Sub-Areas 2, 3, and 5) has been investigated with test pits and site observation. This eastern part of the Winston Farm is the area being considered for the near term and more concentrated development. For the purpose of describing the overall subsurface pattern of Sub-Areas 2, 3, and 5 I have divided it into an eastern area which has deeper predominantly silt and clay or lacustrine soils and a western area which has predominantly gravelly silt loam soils and relatively shallow soils over bedrock. A map showing these areas has been included in the appendix.

At this preliminary stage of the project I have focused on recommended approaches to the grading work, and the importance of building adequate pavement foundations. In addition to those preliminary recommendations I have included preliminary recommendations for the design of foundations for the support of the various planned structures on the various soil units or soil bodies which are found on the site.

The scope of my services has been limited to coordinating the current test pit investigation, analyzing the available soils information, and providing a geotechnical report with preliminary foundation design and grading recommendations. Final design investigations should be conducted for specific structures and roadway locations once project plans are nearing completion. The designers of specific structures, pavements, and appurtenant improvements should be allowed to use their own judgment within current practice standards. Environmental, site design and structural design aspects of the project should be performed by qualified others.

FIELD INVESTIGATION PROCEDURES:

The test pits were excavated using a track-mounted excavator and logged by the geotechnical engineer. Locations were determined by referring to project maps and observation of prominent land marks in the field. Locations were approximately determined in the field using a hand-held gps.

The test pit locations are shown on a preliminary site development map; on an aerial photo map; and on a USDA web survey map of the site showing the extent of the various soil units. The locations on the aerial photo map were plotted using the Google software for latitude and longitude. The locations on the other two maps were plotted approximately based on existing features.

Representative samples were obtained from the test pits and delivered to a testing laboratory for classification testing.

LABORATORY INVESTIGATION:

Natural moisture content tests, sieve analysis tests, and atterberg limit tests were performed on representative samples. The results of these tests have been included on test result sheets in the appendix. I have used the results of these

tests to supplement visual classifications done in the field and incorporate these results into the descriptions on the test pit logs.

SITE CONDITIONS:

The site is situated in an area of glacial till and glaciofluvial desposits with bedrock relatively shallow in some areas as indicated on the "Surficial Geology Map of New York, Lower Hudson Sheet." The bedrock is identified as the "Normanskill Formation" on the "Geologic Map of New York." This bedrock formation includes shale, argillite, and siltstone. The USDA web survey maps also show areas of shallow bedrock. The eastern part of the site (Sub-Areas 2, 3, & 5) which is to be most extensively developed has grass and weed vegetation with patches of brush and trees. The recent and present use of the lowland portions of the property are mainly as livestock farming land. I have included a map of the USDA soil map units on these parts of the site. I have also included the USDA descriptions of each of those soil units. This soil mapping shows that the soil units predominating in the eastern part of the site as fine-grained soils including silt loams or silty clay loams in agricultural or soil science terms. In engineering terminology these soils would be classified as lacustrine clay and silt soils. The names of these soil units include the Hudson soils (HuB, HuC, and HwD) along with Rhinebeck soils (RhA) and Madalin Soils (Ma). There is a substantial soil unit with shallow rock at the northeastern edge of the site (STD). In the western part of Sub-Areas 3, 2, and 5 planned for near term development with lighter structures the soils are gravelly loam and gravelly silt loam soils (BnC, MgB) and similar soils shallow over bedrock (NBf, BOD). There are narrow strips of fine-grained silt and clay soils in the shallow rock areas to the west (Ma & Cd).

The forested part of the Winston Farm Development (Sub-Areas 1 and 4) the USDA information indicates that areas of shallow rock and rock outcrops predominate. The soil bodies there include ARD, BOD, LOC and NBF along among others.

SUBSURFACE CONDITIONS:

The specific subsurface conditions encountered at each test pit location are indicated on the individual test pit logs. However, to aid in the evaluation of

this data, I have prepared a generalized description of the soil conditions based on the test pit data.

There is a layer of topsoil with a typical thickness of 10 to 12 inches on most of the site. Fills were not encountered at the test pit locations beyond the shallow remolded soils common to agricultural operations. Fills will be found along the roadways on the site and around existing building areas.

In the western part of the Sub-Areas 2, 3, & 5 including the proposed camp grounds area, mansion area, village, and apartments area the soils were typically silty topsoil and B horizon soils over gravelly loam and gravelly silt loam soils (USDA BnC & MgB soils) to depths ranging from outcrop to up to 7 feet over the bedrock. The Unified Soil Classifications of the shallow soils was commonly (ML) or (CL-ML), but with significant gravel and sand content. The test pits in this area were TP-13 through TP-19.

The soils in the eastern part of the Sub-Areas 2, 3, & 5 were primarily silt and clay soils deeper than the chosen depth of the test pits with the exception of rock at to 2 to 3.5 feet at the TP-11 location close to the area of shallow rock with the USDA description of STD. The Unified Symbols were commonly (CL, ML, CL-ML, and CH). The (CH) clays were more predominant close to the southern edge of the site. The USDA soil unit descriptions for these silt and clay soils were the Hudson soils (HuB, HuC, HwD, and Rhinebeck soils (RhA). Some of these clay soils had a plate-like structure in the test pit spoil piles due to the fact that they are varved soils with silt partings separating plates or layers of plastic clays that are quite dry and stiff in their structure.

GROUNDWATER CONDITIONS:

Very little groundwater was encountered in the test pits. In the higher ground perched groundwater was found just above the bedrock at a few locations.

Perched groundwater tables may seasonally occur at any elevation in the soil profile due to groundwater being retained by layers or lenses of silty or clayey soils.

Groundwater will be found deeper in the lacustrine clay and silt soils. Some information taken from a groundwater study done on the site during a previous investigation has been included in the appedix.

Some fluctuation in hydrostatic groundwater levels and perched water conditions should be anticipated with variations in the seasonal rainfall and surface runoff.

ANALYSIS AND RECOMMENDATIONS:

Site Work:

Building Sites and Roadways:

The proposed construction areas should cleared and grubbed and stripped of all organic topsoil and vegetation along with any uncontrolled fill. The site should be proof-rolled to tighten the soil loosened by the stripping and to identify any soft spots. Any soft spots should be excavated and backfilled with controlled granular fill.

***Controlled Fill*:**

All of the on-site virgin soil materials can be used as controlled structural fill if they can be compacted to the specified density. The fine grained soils should not be used as controlled fill in areas requiring good drainage. Fills requiring good drainage properties should have no more than 10% of fines (silt and clay fraction). Areas requiring good drainage would be the backfill around foundations or fill used as slab base, pavement base or pavement subbase. I recommend NYS DOT subbase items for use as foundation backfill and backfill over drains.

On-site material may be difficult to compact during wet weather or poor drying conditions. However, in seasons when on-site materials can be brought close enough to optimum moisture content and good drainage properties are not required all of the non-organic or mineral on-site soils can be used for controlled structural fill to support buildings and pavements. The grading

work should be planned for seasons with good drying conditions. Excavation and compaction techniques should be designed to dry the soil as necessary for compaction, and then seal the exposed fill to shed rainfall.

The requirements for in-place density in the final designs should be realistic to allow the specified compaction of fills to adequate performance levels without increasing costs with large numbers of passes of the compactor or unnecessary project delays attempting to dry or wet soils to reach an specified moisture content. Standard practice should be followed in any case.

In addition to foundation backfill and drain pipe backfill areas fill materials with good drainage properties should be used in the freezing zones beneath pavements and sidewalks. The design freezing zones extend to a depth of 4 feet below finished grade. Frost heave will be most severe in shaded areas such as those on the north or northeast sides of structures and in areas which are normally plowed to remove snow cover.

In the effort to reduce frost action and maintain good drainage on fill deposits beginning a fill with a first lift of clean sand and gravel (drainage fill) will reduce the soil suction bringing moisture up into a fill and will allow seeping water moving vertically downward to exit to the surface or a drain pipe as applicable.

If seeping groundwater is enountered in construction areas, drainage should be supplemented with drain pipes.

All controlled fill should be free of organic and/or frozen material.

***Building Foundations*:**

Light wood-framed buildings can be supported on reinforced concrete foundations on existing virgin soils or on controlled fill which rests on the original soils.

I normally recommend a minimum footing width of 2.0 feet for load-bearing strip footings. Isolated footings should be at least 3.0 feet wide. Individual

designers of specific structures should be allowed to design their foundation according to normal practice standards.

Exterior footings or footings in unheated areas should have a minimum of 4.0 feet of embedment for protection from frost action. Interior footings should have a minimum embedment of 1.5 feet below finished grade to develop the bearing value of the soils.

The exterior foundation walls should have a slotted drain pipe placed around the exterior base of the wall. If the drain slots are not larger than 1/8 inch in width and the wall is backfilled with NYS DOT subbase or a similar clean, granular, item no geotextile or other special backfill would be needed for the drain to function. The drain pipe should drain to a stormwater sewer, or daylight.

***Floor Slabs*:**

Floor slabs can be designed to rest on virgin, inorganic, soils or on controlled fills resting on virgin materials. A 4-inch or thicker layer of well-graded, free-draining, granular material should be placed beneath the floor slab to provide drainage, act as a capillary break, and to provide better and more uniform support.

The slab and slab base should be designed for any post loads or wheel loads. Area loads are not likely to be an issue with the proposed residential structures

Structures with Moderate or Heavy Loads:

Each proposed structure will require a subsurface investigation. The design loads, settlement tolerances, and the local soil conditions will determine the type of foundation required.

It is likely that most or all of the structures proposed could be supported on spread footing foundations given normal settlement tolerances. Heavy design loads or structures that will require deep fills may require deep foundations, monitoring of fill settlement or pre-consolidation of building sites in areas where deep soft soils are encountered.

Pavement Foundations:

While the existing paved roadways appear to be in generally good condition the soils on the site have a high enough content of silt and clay with relatively shallow perched groundwater in some areas to make frost heave and thaw a major consideration. I recommend that future investigations and the investigations for the design of particular projects include an investigation of pavements in the neighborhood to determine the needs for pavement foundations and drainage to limit damage due to frost action.

Seismic Design Recommendations:

The building sites which have the proposed footings within 10 feet of bedrock will be Class B sites.

The building sites which have deeper soils over bedrock will be either Class C or Class D sites. All of the sites these sites will be at least Class D sites by default unless there is enough information to classify them otherwise. The Class C sites will be mainly limited to areas with the shallow soils. It is possible that some very dense glacial till soils will be found by borings in deeper soil areas that would support Site Class C requirements.

The design spectral accelerations for Saugerties, NY, using ASCE 7-16 are:

Ss 0.187g
S1 0.054g

CONSTRUCTION PROCEDURES AND PROBLEMS:

After clearing, grubbing, and stripping of topsoil, vegetation and in-situ fill, all of the virgin, mineral, soils are suitable for use as controlled fill provided that they can be compacted to the specified in-place densities.

The principal obstacle for good compaction is drying the soils that are on the wet side of the optimum moisture content. In dry climates and very dry seasons it can happen that soils in place are too dry of the optimum moisture

content and application of molding water is required. On this site it is likely that the drying of fill soils will be required.

If fill soils are used that have a high plasticity index (CH and CL-CH) and similar granular soils with a very high clay content, they should be compacted on the wet side of the optimum moisture content to reduce their swell potential.

If it can be done, the application of agricultural style drainage of the shallow soil strata can be done well in advance of the actual grading. This will reduce the moisture content of on-site borrow soils and stiffen the subgrades of soils left in place to facilitate compaction.

Given good drying conditions fill material too wet of optimum moisture for compacting to the specified density can be aerated in lifts using a disc harrow, roto-tiller, or other equipment to reduce the moisture content.

The first lift of design fills should be a granular material that will drain to remove downward percolating moisture and preferably a material that has less than 10% fines to reduce or stop the drawing up of subgrade moisture into the fill by pore water suction. The reduction of movement of subgrade moisture into an embankment fill is very important to reduce the number and size of frost lenses that would otherwise be fed by this kind of moisture migration. Reducing moisture migration into subgrades will also improve the stability of the subgrade.

Placement of coarse fill or fractured rock fill on the subgrade in the principal construction roadways either over a high strength separation reinforcement fabric or by rolling the coarse material into the subgrade is a good procedure to avoid the failure of construction roads prior to pavement construction and to improve future pavement performance. Thorough rolling of these coarse materials with heavy equipment will be adequate if observed by a qualified engineer and compaction testing will not be required. Subsequent layers of controlled fill, subbase, and base could be placed over this improved subgrade.

All excavations of more than a few feet should be sheeted and braced or laid back to prevent sloughing in of the sides.

Excavations should not extend below existing structures or utilities unless properly designed sheeting and bracing or underpinning is installed.

Sump-pit and sump-pump-type dewatering may be required in excavations or low areas during wet weather or if groundwater is encountered.

Temporary paving using coarse fill material or separation/ reinforcement geotextile and coarse fill material may be required for moving about the site during wet or thaw weather.

Subgrades should be kept from freezing during construction.

Water, snow, and ice should not be allowed to collect and stand in excavations or low areas of the subgrade.

Some obstacles, including old foundations and possibly boulders, may be encountered in excavations. Bedrock will be encountered in the shallow rock areas by definition.

A qualified engineer should observe subgrades before placement of fill or construction of buildings and observe the proof-rolling of subgrades.

A qualified testing laboratory should monitor the quality of borrow and imported materials and the placement and compaction of controlled fill.

The in-place density of asphaltic concrete pavement layers should also be monitored. The density of asphalt concrete directly affects the stiffness which in turn affects the pavement's service life.

FUTURE SUBSURFACE INVESTIGATION:

Consider a Cone Penetrometer Rig as Well as Boring Equipment:

In those areas with Hudson soils and other lacustrine soils there may be deep clays and silts and some strata may be soft or soft and somewhat compressible. It is worth considering to begin investigation in lacustrine soil areas using a seismic equipped cone penetrometer rig. This kind of equipment can provide

all the design data needed beyond a few borings to identify soils visually. The cone data along with the use of a dilatometer that works with the cone rig can provide the modulus and strength data needed for heavy foundations on compressible soil that is over-consolidated. Nearly all Hudson Valley soils are over-consolidated due to the glaciation and subsequent erosion of much of the overburden. One day of use of a cone penetrometer crew would provide valuable subsurface design information that would be economical when applied to more than one project or several projects.

Shear wave velocities as can be measured in "down-hole" mode with a seismic cone rig will provide advantages in achieving a better site classification and higher safety factors against liquefaction.

Use of GPS and Aerial Photo Interpretation in Shallow Rock Areas:

There are areas along the western sides of Sub-Areas 2, 3, & 5 as well as large areas in the green and light development areas (Sub Areas 1 &4) with shallow rock and numerous rock outcroppings. As the depth of the soil overburden over rock becomes less, the greater the need to know rock surface elevations relative to the information needed about the nature of the soil.

GPS equipment could be used to take spot locations of outcroppings of rock and the location of probes made by soil auger, backhoe, or pneumatic drills to contour the bedrock as well as sample the overburden. It often happens that a soil boring crew is sent to sites with shallow rock and are frustrated by shallow refusals, the need to move and retry, and the accompanying need to have survey support to locate their short borings or probes.

Winston Farm Development

File No. 6526

CONTENTS OF APPENDIX:

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS

SS	:	Split-Spoon— 1 3/4" I.D., 2" O.D., except where noted
S	:	Shelby Tube — 2" O.D., except where noted
PA	:	Power Auger Sample
DB	:	Diamond Bit — NX: BX: AX:
CB	:	Carboloy Bit — NX: BX: AX:
OS	:	Osterberg Sampler — 3" Shelby Tube
HS	:	Housel Sampler
WS	:	Wash Sample
FT	:	Fish Tail
RB	:	Rock Bit
WO	:	Wash Out

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch OD split spoon, except where noted

WATER LEVEL MEASUREMENT SYMBOLS

WL	:	Water Level
WCI	:	Wet Cave In
DCI	:	Dry Cave In
WS	:	While Sampling
WD	:	While Drilling
BCR	:	Before Casing Removal
ACR	:	After Casing Removal
AB	:	After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils the accurate determination of ground water elevations is not possible in even several day's observation, and additional evidence on ground water elevations must be sought.

CLASSIFICATION

COHESIONLESS SOILS

"Trace"	:	1% to 10%
"Trace to some"	:	10% to 20%
"Some"	:	20% to 35%
"And"	:	35% to 50%
Loose	:	0 to 9 Blows
Medium Dense	:	10 to 29 Blows
Dense	:	30 to 59 Blows
Very Dense	:	≥ 60 Blows

} or equivalent

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, then clay becomes the principle noun with the other major soil constituent as modifiers: i.e., silty clay. Other minor soil constituents may be added according to classification breakdown for cohesionless soils; i.e., silty clay, trace to some sand, trace gravel.

Soft	:	0.00 — 0.59 tons/ft^2
Medium	:	0.60 — 0.99 tons/ft^2
Stiff	:	1.00 — 1.99 tons/ft^2
Very Stiff	:	2.00 — 3.99 tons/ft^2
Hard	:	≥ 4.00 tons/ft^2

SITE DATA

1. TAX ACCOUNT NUMBERS:

   17.15-3-4 17.15-3-8 17.16-1-1.110
   17.16-1-36 17.2-3-10 17.2-3-15 17.2-4-32
   17.2-5-38 17.2-5-39.120 17.2-5-40
   17.2-5-41
2. PARCEL ADDRESS: VARIES
3. TOTAL PARCEL AREA: +/- 840 ACRES
4. EXISTING ZONING: MDR - MODERATE DENSITY RESIDENTIAL, RH - RESIDENTIAL HAMLET, COMMERCIAL
5. EXISTING USE: UNDEVELOPED
6. PROPOSED USE: RESORTS, CAMPGROUNDS, EVENT SPACE, RESIDENTIAL
7. FEDERALLY REGULATED WETLANDS: YES, SEE DRAWING (PER USACOE FEDERAL WETLAND INVENTORY)
8. STATE REGULATED WETLANDS: YES, SEE DRAWING (PER NYSDEC WETLAND INVENTORY)
9. FLOOD PLAIN: YES, SEE DRAWING (PER FIRM MAP COMMUNITY PANEL NO. 36111C0305E DATED 09/24/2009)
10. ALL IMPROVEMENTS SHALL BE MADE IN ACCORDANCE WITH THE CURRENT DEVELOPMENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY

KEY MAP LEGEND

1. HOTEL & CONFERENCE CENTER
2. COMMERCIAL
3. STORM WATER MANAGEMENT
4. AUDITORIUM (+/- 2,500 SEATS) AND EVENT CENTER
5. TECH & BUSINESS PARK
6. PUBLIC PARK + RESIDENTIAL
7. MULTI-FAMILY HOUSING (MARKET RATE, SENIOR, WORKFORCE)
8. REHABILITATED SNYDER FARM HOUSE + BARN
9. VILLAGE - HIGH DENSITY SINGLE FAMILY
10. BOUTIQUE HOTEL + OPEN SPACE
11. CAMPGROUNDS (MIXED-USE)
12. CABINS
13. SINGLE FAMILY LOTS
14. ESTATE LOTS

LEGEND

- BUILDINGS
- PARKING
- TREE COVER
- LAWN
- WETLANDS - DELINEATED
- WETLANDS - FEDERAL (NWI)
- WETLANDS - STATE (NYS ERM)
- FEMA FLOODPLAIN
- ROADS
- TRAILS
- PROPERTY LINES
- PROJECT BOUNDARY
- ZONING DISTRICT BOUNDARY

SUB-AREAS (+/- 811 ACRES)

1. RESIDENTIAL LOW DENSITY (RLD) +/- 272 ACRES
2. RESIDENTIAL HIGH DENSITY (RHD) +/- 74 ACRES
3. PERIMETER COMMERCIAL +/- 123 ACRES
4. CENTRAL RECREATION +/- 295 ACRES
5. HIGH-TECH COMMERCIAL +/- 47 ACRES

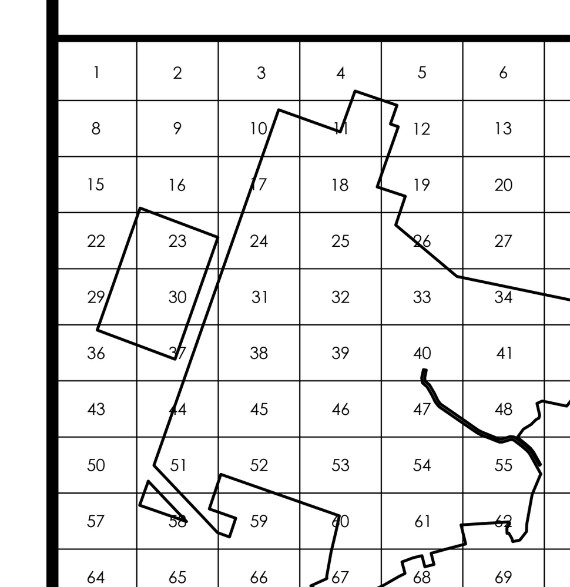
PASSERO ASSOCIATES
engineering architecture

WINSTON FARM

DEVELOPMENT CONCEPT PLAN

20202934.0001
MARCH, 2023
SAUGERTIES, NY

C3



PASSERO ASSOCIATES
engineering architecture

Client:
WINSTON FARMS

SAUGERTIES, NY

PASSERO ASSOCIATES

242 West Main Street Suite 100
Rochester, New York 14614
(585) 325-1000
Fax: (585) 325-1691

Principal-in-Charge: Jess Sudol, PE
Project Manager: Chris LaPorta, PE, CDT
Designed by: D.J. Goodall, EIT

Revisions

No.	Date	By	Description
1			

MASTER PLAN SHEET SET WINSTON FARMS DEVELOPMENT

Town/City: ROCHESTER
County: MONROE
State: NEW YORK

Project No.
20202934.0001

Drawing No.
C-130

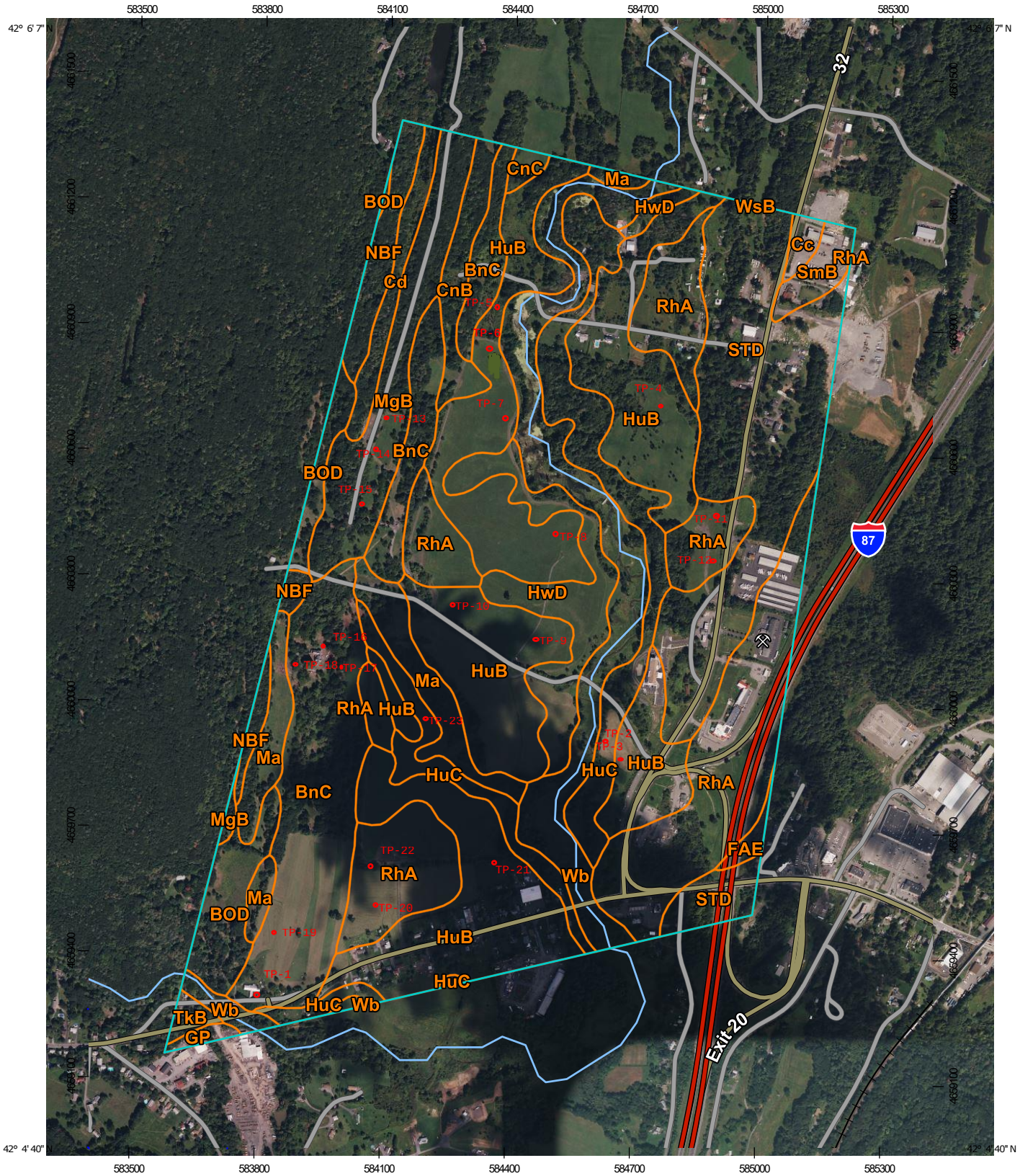
Sheet No.
GEO

Scale:
1" = 50'

Date
APRIL 5, 2023

NOT FOR CONSTRUCTION

Custom Soil Resource Report
Soil Map



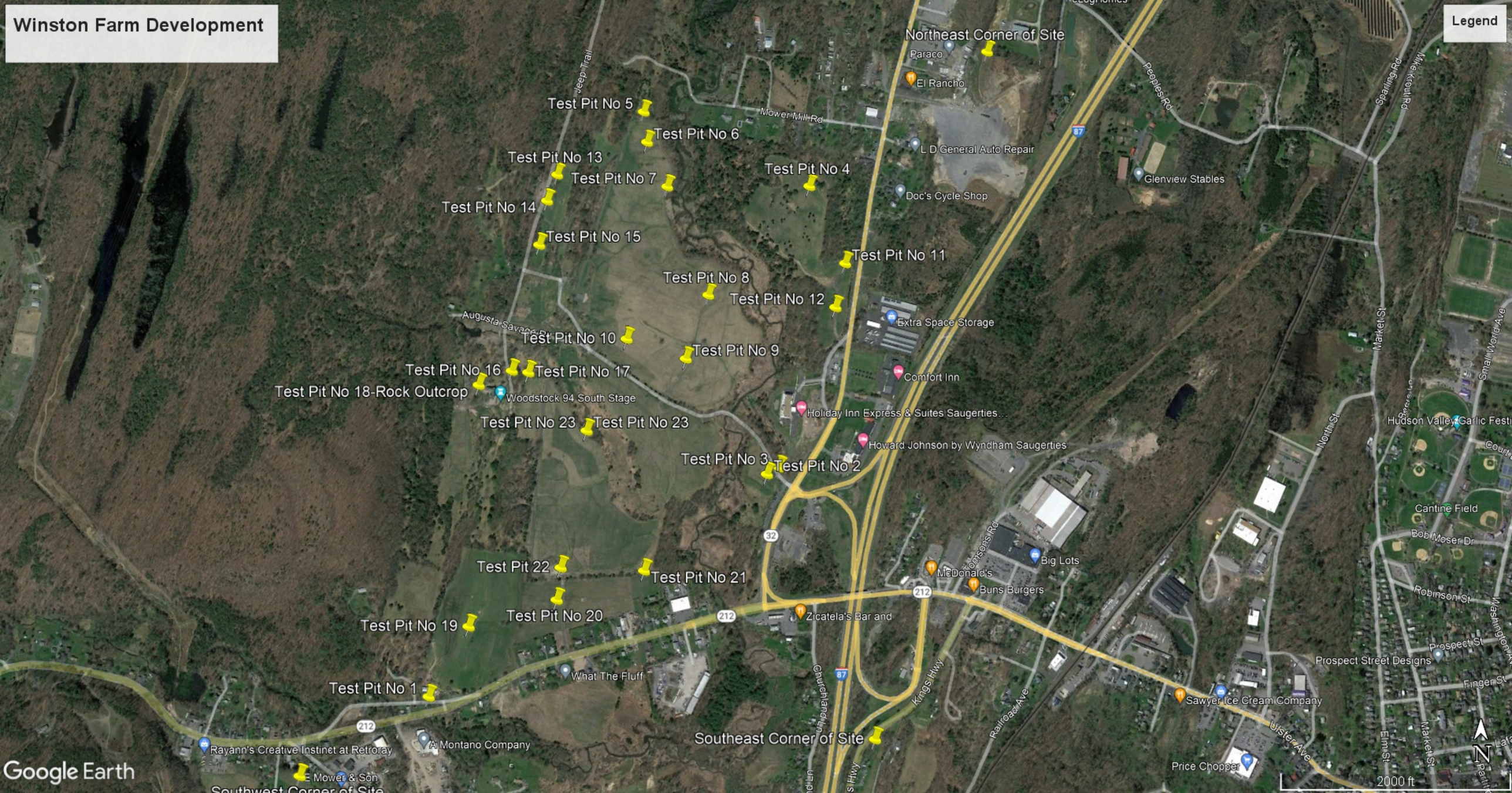
Map Scale: 1:13,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84


Winston Farm Development
Legend
Northeast Corner of Site
Paraco
El Rancho
Test Pit No 5
Test Pit No 6
Test Pit No 13
Test Pit No 7
Test Pit No 14
Test Pit No 15
Test Pit No 4
L D General Auto Repair
Glenview Stables
Doc's Cycle Shop
Test Pit No 11
Test Pit No 8
Test Pit No 12
Extra Space Storage
Test Pit No 10
Test Pit No 9
Test Pit No 16
Test Pit No 17
Test Pit No 18-Rock Outcrop
Woodstock 94 South Stage
Comfort Inn
Holiday Inn Express & Suites Saugerties...
Howard Johnson by Wyndham Saugerties
Test Pit No 23
Test Pit No 23
Test Pit No 3
Test Pit No 2
Test Pit 22
Test Pit No 21
Test Pit No 20
Test Pit No 19
Test Pit No 1
Zicatela's Bar and
McDonald's
Buns Burgers
Big Lots
What The Fluff
Rayann's Creative Instinct at Retroray
A Montano Company
Southeast Corner of Site
Sawyer Ice Cream Company
Prospect Street Designs
Price Chopper
Hudson Valley Garlic Festi
Cantine Field
Bob Moser Dr
Robinson St
Prospect St
Finger St
Market St
North St
Small World Ave
Mike Krout Rd
Sparling Rd
Peoples Rd
Mower Mill Rd
Jeep Trail
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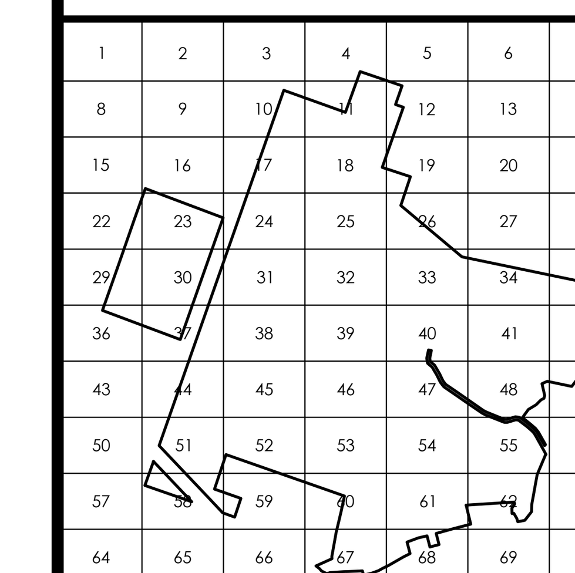
PA

PASSERO ASSOCIATES
engineering architecture



Client:

WINSTON FARMS

SAUGERTIES, NY

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Revisions

No.	Date	By	Description
1			

MASTER PLAN SHEET SET WINSTON FARMS DEVELOPMENT

Town/City: ROCHESTER
County: MONROE State: NEW YORK

Project No.
20202934.0001

Drawing No.
C-130

Sheet No.
GEO

Scale:
1" = 50'

Date
APRIL 5, 2023

NOT FOR CONSTRUCTION

TEST PIT LOGS

Proposed Winston Farm Development
State Route 32, Saugerties, NY

TP-1 42.081 N -73.987 W

0.0 - 1.0	Topsoil
1.0 - 2.5	Silt, trace to some Sand, light yellow brown, moist (CL-ML)
2.5 - 4.5	Sand & Gravel, brown, moist (SM-GM)
4.5 - 5.0	Silty Clay, brown, stiff (CL)
	End of Test Pit- 5.0 feet
	No Groundwater

TP-2 42.08635 N -73.97613 W

0.0 - 1.0	Topsoil
1.0 - 2.5	Silty Clay, light brown, very stiff, moist (CL)
2.5 - 7.0	Silty Clay, yellow brown, very stiff, moist (CL)
	End of Test Pit - 7.0 feet
	No Groundwater

TP-3 42.08648 N -73.97573 W

0.0 - 1.0	Topsoil
1.0 - 2.0	Silty Clay, light brown, stiff (CL-ML)
2.0 - 8.0	Silty Clay with Silt Partings, brown, stiff (Varved Clay) (CL & ML)
8.0 - 8.5	Similar Soils, water coming in below 8.0 feet
	End of Test Pit - 8.5 feet
	Groundwater coming in below 8 feet

TP -4 42.0934 N -73.9747 W

0.0 - 1.0	Topsoil
1.0 - 3.0	Silty Clay, light brown, dry to moist, stiff (CL)
3.0 - 7.5	Silty Clay, with Silt Partings, structured in plates 1 to 1.5 inches thick, reddish brown, dry to moist (CL, ML, CH)

End of Test Pit - 7.5 feet
No Groundwater

TP - 5 42.09535 N - 73.98027 W

0.0 - 1.0 Light brown, Clayey Topsoil
1.0 - 3.0 Silt, some Sand, trace Clay, light brown, moist (CL-ML)
3.0 - 6.0 Silty Clay, brown mottled gray below 4 feet (CL-CH)

End of Test Pit - 6.0 feet
No Groundwater

TP - 6 42.09458 N -73.98017 W

0.0 - 1.0 Topsoil with grass sod
1.0 - 2.0 Silty Clay, light brown, dry to moist (desiccated) (CL-ML)
2.0 - 8.0 Silty Clay, brown, stiff to very stiff (CL - CH)

End of Test Pit - 8.0 feet
No Groundwater

TP - 7 42.09353 N -73.97951 W

0.0 - 1.0 Topsoil
1.0 - 3.0 Silty Clay, brown, dry (CL - ML)
3.0 - 8.0 Silty Clay, light brown, moist, peels in 1 to 2 inch layers below 3.0 feet (CL-CH)

End of Test Pit - 8.0 feet
No Groundwater

TP - 8 42.09077 N - 73.9781 W

0.0 - 0.8 Topsoil, moist to wet in hay field
0.8 - 1.5 Silty Clay, light brown, dry to moist, (CL)
1.5 - 8.0 Silty Clay, brown, moist, peels up in plates and layers with Silty Partings (CL, ML, CH)

End of Test Pit - 8.0 feet

No Groundwater

TP - 9 42.08918 N -73.97895 W

0.0 - 1.0 Topsoil, mowed hay field
1.0 - 3.0 Silty Clay, light brown, dry (CL)
3.0 - 7.5 Silty Clay, light brown, desiccated, peels up in plates with Silt partings, moist (CL, ML, CH)

End of Test Pit - 7.5 feet
No Groundwater

TP - 10 42.0897 N - 73.98079 W

0.0 - 1.5 Topsoil, mowed field, light color
1.5 - 3.0 Silty Clay, yellow brown, dry to moist (CL)
3.0 - 9.0 Silty Clay, stiff, brown, moist (CL)

End of Test Pit - 9.0 feet
No Groundwater

TP - 11 42.09156 N - 73.97365 W

0.0 - 0.8 Topsoil with tall grass
0.8 - 2 to 3.5 Silty Clay, dry, friable, loamy (CL)

End of Test Pit - 2 to 3. 5 feet-refusal on limestone with chert

TP - 12 42.09045 N - 73.97378 W

0.0 - 0.8 Topsoil
0.8 - 1.5 Silty Clay, light brown, desiccated (CL)
1.5 - 7.5 Silty Clay, light brown, moist, peels up in plates with Silt partings (CL, CH, ML)

End of Test Pit - 7.5 feet
No Groundwater

TP - 13 42.09371 N - 73.98315 W

0.0 - 0.5 to 1.0	Three inches of Sod over Crushed Stone Fill
0.5 to 1.0 - 4.5	Silty Clay, trace to some Gravel & Sand, moist to wet, friable (CL)
4.5 - 5.0	Silty Clay, wet, brown (CL)
	End of Test Pit - 5.0 refusal on rock No stabilized Groundwater- perched groundwater
TP -14	42.09303 N -73.98341 W
0.0 - 2.0	Three inches of grass sod and Topsoil over Clayey Silt, trace to some Sand & Gravel, brown, moist (ML-SM)
2.0 - 3.5	Silt, trace to some Sand & Gravel, brown, moist (ML-SM)
	End of Test Pit - 3.5 Refusal on Rock No Groundwater
TP -15	42.09195 N - 73.98372 W
0.0 - 1.0	Topsoil with grass sod
1.0 - 2.0	Silt, yellow brown, plastic, loamy, moist (CL-ML)
2.0 - 4.0	Silt, plastic, loamy, brown, moist (CL-ML)
	End of Test Pit - 4.0 feet Refusal on Rock No Groundwater
TP - 16	42.08825 N - 73.98457 W
0.0 - 0.5	Topsoil with grass sod
0.5 - 2.5	Silt, some Gravel, Sand & Cobbles (ML)
	End of Test Pit - 2.5 feet Refusal on Rock
TP - 17	42.08839 N - 73.98396 W
0.0 - 1.0	Topsoil, mowed field
1.0 - 3.0	Silt, trace to some Sand, trace clay, loamy structure, brown, moist (CL-ML)

3.0 - 7.0	Silty Clay, trace to some Gravel & Cobbles, loamy structure, brown, moist (CL)
	End of Test Pit - 7.0 feet Refusal on Smooth Rock Bottom, Perched groundwater seeping in below 5 feet
TP - 18	42.08499 N - 73.9853 W
0.0 - 1.0	Silt, trace to some Sand & Gravel, brown, moist (ML) topsoil
	End of Test Pit - 1.0 feet Refusal on Rock No Groundwater Large Bedrock Outcrop nearby
TP - 19	42.0827 N -73.9858 W
0.0 - 1.0	Topsoil, dry, light
1.0 - 2.5	Gravel & Silt, trace to some Sand, light brown, dry to moist (GM- ML)
	End of Test Pit - 2.5 feet Refusal on Flat-Bedded Shale Bedrock No Groundwater
TP -20	42.08334 N - 73.98296 W
0.0 - 0.8	Topsoil
0.8 - 2.5	Silty Clay, friable - loamy, brown, moist (CL)
2.5 - 8.5	Silty Clay, layers of plastic clay, (CL & CH)
	End of Test Pit - 8.5 No Groundwater
TP - 21	42.084 N -73.98134 W
0.0 - 0.8	Clayey Topsoil with short grass
0.8 - 2.0	Silty Clay, yellow brown, moist, stiff (CL-CH)

2.0 - 8.5	Silty Clay, blocky structure, plastic, brown, moist (CL-CH)
	End of Test Pit - 8.5 feet No Groundwater
TP - 22	42.08406 N - 73.98291 W
0.0 - 0.8	Topsoil, clayey
0.8 - 2.5	Silty Clay, dry to moist, light brown, stiff (CL-CH)
2.5 - 8.0	Silty Clay, brown, moist, blocky structure, stiff (CL-CH)
	End of Test Pit - 8.0 feet No Groundwater
TP -23	42.08735 N - 73.98212 W
0.0 - 1.5	Silty Clay, dry to moist, brown (CL)
1.5 - 8.5	Silty Clay, brown, moist, blocky structure, stiff (CL-CH)
	End of Test Pit - 8.5 feet No Groundwater

CONSTRUCTION TECHNOLOGY

INSPECTION & TESTING DIVISION, P.D.& T.S., INC.
4 William Street, Ballston Lake, New York 12019
Phone: (518) 399-1848 Email: constructiontech@live.com

CLIENT: **VERNON HOFFMAN, P.E.**
21420 BAY VILLAGE DRIVE, UNIT 212
FORT MYERS BEACH, FLORIDA 33931

REPORT DATE: 08/15/23
SAMPLE NUMBER: 23471
OUR FILE NO: 447.000

Robert Behan

ATT'N: MR. VERNON HOFFMAN, P.E.
REVIEWED BY: ROBERT BEHAN, NICET

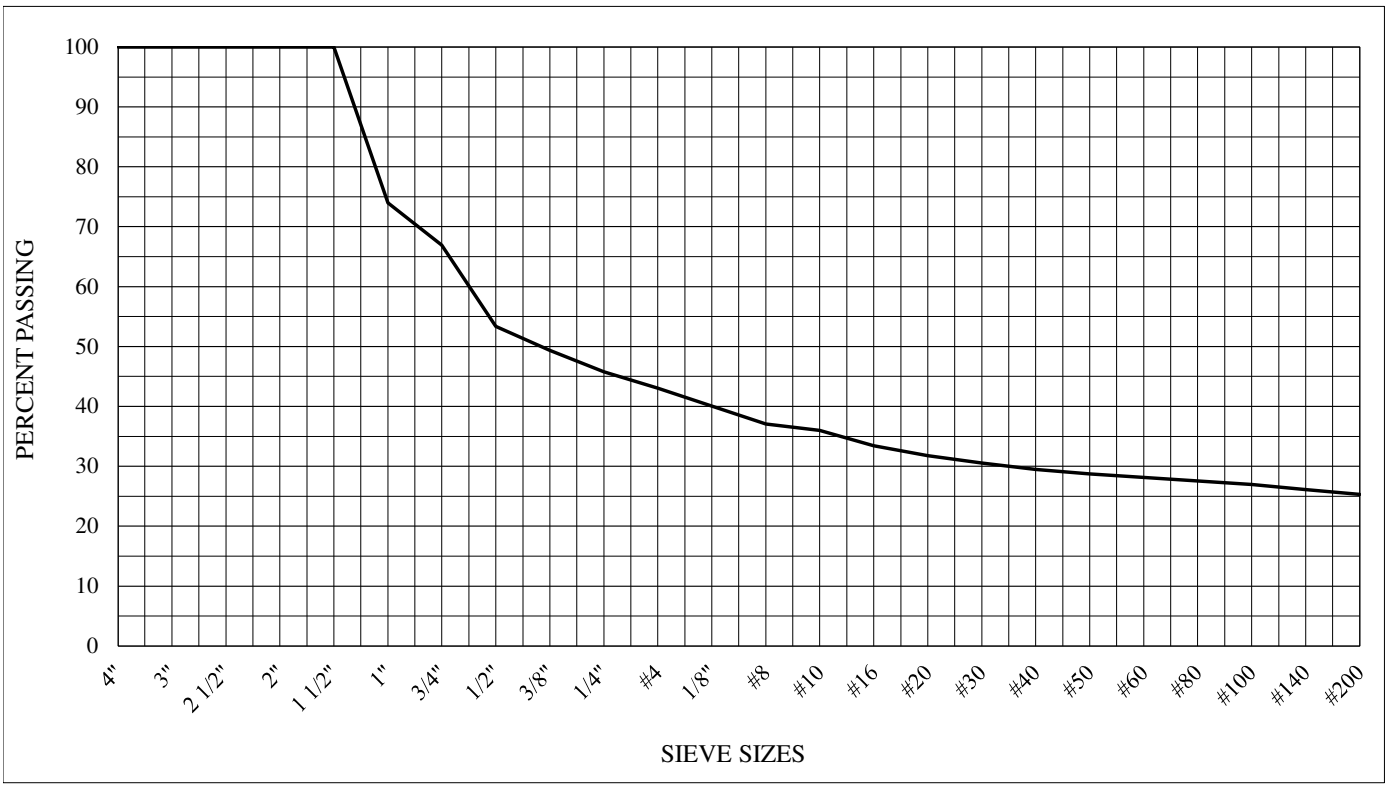
PROJECT: **WINSTON FARM PROJECT**

ASTM C136 / C117 / D422: SIZE DISTRIBUTION OF SOIL & AGGREGATES: SIEVE ANALYSIS

MATERIAL SOURCE: **TP-19, 2'**
MATERIAL DESCRIPTION: GRAVEL, fine; some Silt/Clay; little Sand
MATERIAL PROJECT USE: PER CLIENT
EVALUATION SPECIFICATION: PER CLIENT

COARSE SIEVE SERIES: US STANDARD				MEDIUM SIEVE SERIES: US STANDARD				FINE SIEVE SERIES: US STANDARD			
SIEVE SIZE	PERCENT RETAINED	PERCENT PASSING	SPECIFICATION ALLOWANCE	SIEVE SIZE	PERCENT RETAINED	PERCENT PASSING	SPECIFICATION ALLOWANCE	SIEVE SIZE	PERCENT RETAINED	PERCENT PASSING	SPECIFICATION ALLOWANCE
4"				1/4"	54.2	45.8		#50	71.2	28.8	
3"				#4	57.0	43.0		#60			
2 1/2"				1/8"				#80			
2"				#8	62.9	37.1		#100	73.1	26.9	
1 1/2"		100.0		#10				#140			
1"	26.0	74.0		#16	66.5	33.5		#200	74.7	25.3	
3/4"	33.1	66.9		#20				SILT			
1/2"	46.7	53.3		#30	69.4	30.6		CLAY			
3/8"	50.6	49.4		#40	70.5	29.5		COLLOID			

ASTM D-2216	ASTM D-4318	ASTM D-4318	ASTM D-4318
MOISTURE CONTENT	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
13.1%	**32.9%**	**23.5%**	**9**



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INSPECTION & TESTING DIVISION, P.D.& T.S., INC.
4 William Street, Ballston Lake, New York 12019
Phone: (518) 399-1848 Email: constructiontech@live.com

CLIENT: **VERNON HOFFMAN, P.E.**
2A FREEMAN'S BRIDGE ROAD
SCHENECTADY, NEW YORK 12302

REPORT NUMBER: 1 : PAGE: 1
REPORT DATE: 08/15/23
OUR FILE NUMBER: 447.000
LAB SAMPLE NUMBER: 23472

ATT'N: MR. VERNON HOFFMAN, P.E.

PROJECT: **WINSTON FARM PROJECT**

DETERMINATION OF PLASTICITY INDEX & WATER (MOISTURE) CONTENT IN SOILS

SAMPLE ID: **TP-20, 4'-5'**

ASTM D-4318 LIQUID LIMIT	ASTM D-4318 PLASTIC LIMIT	ASTM D-4318 PLASTICITY INDEX	ASTM D-2216 MOISTURE CONTENT
55.3%	**26.9%**	**28**	**22.1%** AS RECEIVED

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RESPECTFULLY SUBMITTED,
CONSTRUCTION TECHNOLOGY
ROBERT B BEHAN
ROBERT BEHAN (NICET)
MANAGER TECHNICAL SERVICES

CONSTRUCTION TECHNOLOGY

INSPECTION & TESTING DIVISION, P.D.& T.S., INC.
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Phone: (518) 399-1848 Email: constructiontech@live.com

CLIENT: **VERNON HOFFMAN, P.E.**
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SCHENECTADY, NEW YORK 12302

REPORT NUMBER: 1 : PAGE: 1
REPORT DATE: 08/15/23
OUR FILE NUMBER: 447.000
LAB SAMPLE NUMBER: 23473

ATT'N: MR. VERNON HOFFMAN, P.E.

PROJECT: **WINSTON FARM PROJECT**

DETERMINATION OF PLASTICITY INDEX & WATER (MOISTURE) CONTENT IN SOILS

SAMPLE ID: **TP-21, 4'-5'**

ASTM D-4318 LIQUID LIMIT	ASTM D-4318 PLASTIC LIMIT	ASTM D-4318 PLASTICITY INDEX	ASTM D-2216 MOISTURE CONTENT
56.3%	**27.1%**	**29**	**25.6%** AS RECEIVED

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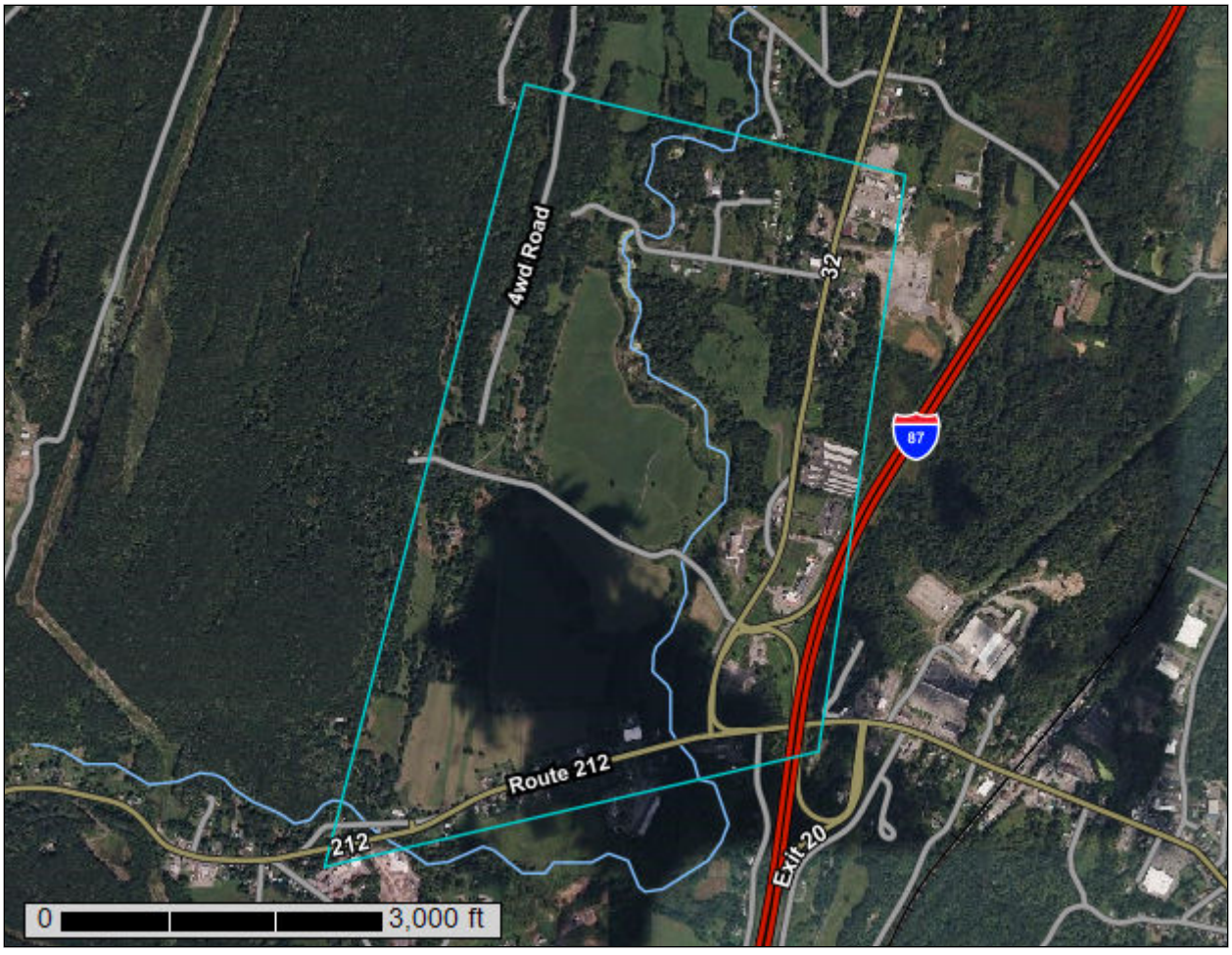
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

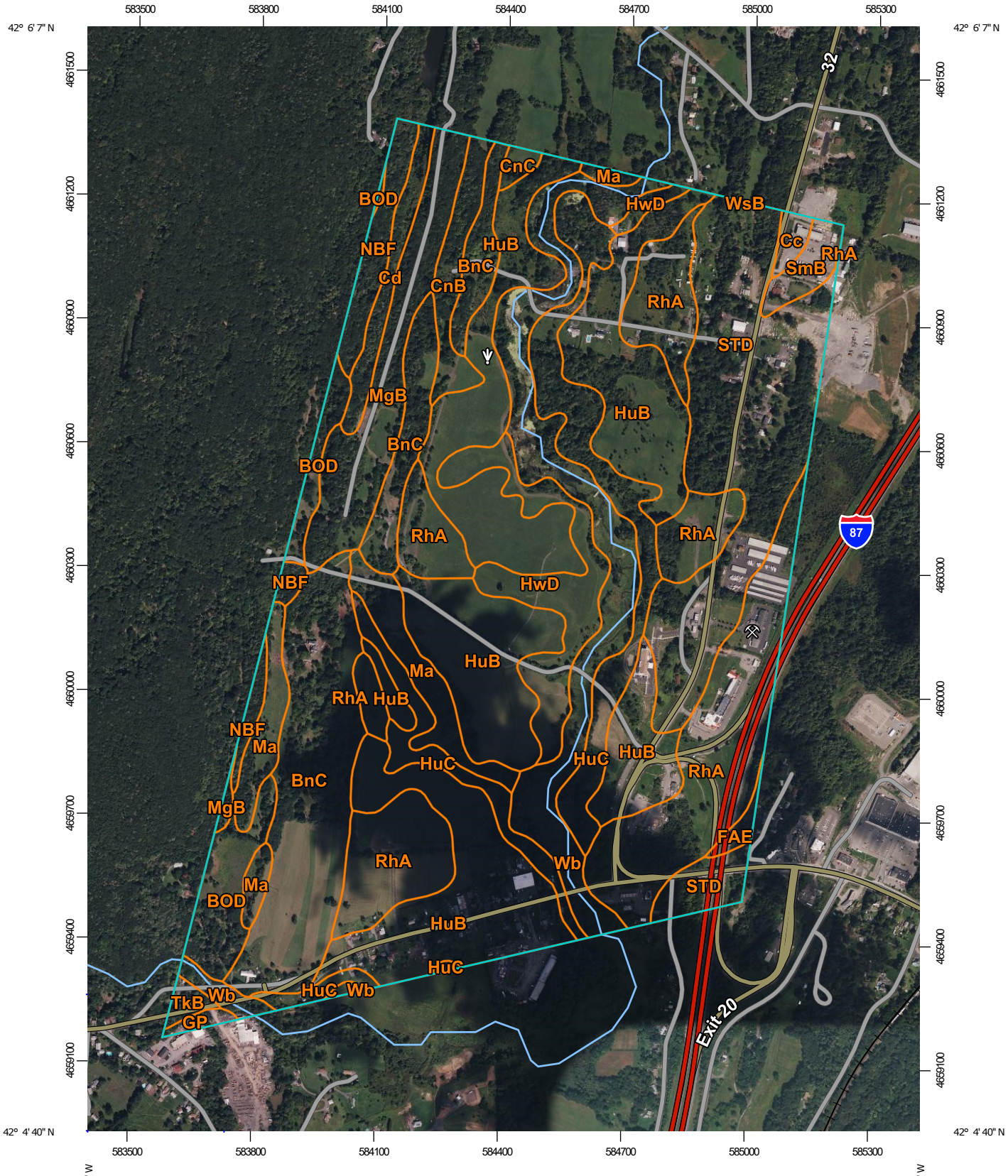
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Ulster County, New York



August 24, 2023

Custom Soil Resource Report
Soil Map



Map Scale: 1:13,000 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BnC	Bath-Nassau complex, 8 to 25 percent slopes	65.2	11.0%
BOD	Bath-Nassau-Rock outcrop complex, hilly	17.0	2.9%
Cc	Canandaigua silt loam	2.3	0.4%
Cd	Canandaigua silt loam, till substratum	7.9	1.3%
CnB	Chenango gravelly silt loam, 3 to 8 percent slopes	9.4	1.6%
CnC	Chenango gravelly silt loam, 8 to 15 percent slopes	1.6	0.3%
FAE	Farmington-Rock outcrop complex, steep	1.7	0.3%
GP	Gravel pit	1.4	0.2%
HuB	Hudson silt loam, 3 to 8 percent slopes	144.2	24.3%
HuC	Hudson silt loam, 8 to 15 percent slopes	41.5	7.0%
HwD	Hudson and Schoharie soils, 15 to 25 percent slopes	23.3	3.9%
Ma	Madalin silty clay loam	21.9	3.7%
MgB	Mardin-Nassau complex, 3 to 8 percent slopes	27.6	4.6%
NBF	Nassau-Bath-Rock outcrop complex, very steep	12.3	2.1%
RhA	Rhinebeck silt loam, 0 to 3 percent slopes	88.6	14.9%
SmB	Stockbridge-Farmington gravelly silt loams, 3 to 8 percent slope	5.2	0.9%
STD	Stockbridge-Farmington-Rock outcrop complex, hilly	74.9	12.6%
TkB	Tunkhannock gravelly loam, 3 to 8 percent slopes	1.9	0.3%
Wb	Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded	46.5	7.8%
WsB	Williamson silt loam, 3 to 8 percent slopes	0.0	0.0%
Totals for Area of Interest		**594.4**	**100.0%**

Ulster County, New York

BnC—Bath-Nassau complex, 8 to 25 percent slopes

Map Unit Setting

National map unit symbol: 9xft
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Bath and similar soils: 50 percent
Nassau and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 28 inches: gravelly loam
H3 - 28 to 48 inches: very gravelly loam
H4 - 48 to 52 inches: bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 26 to 38 inches to fragipan; 40 to 80 inches to lithic bedrock
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 24 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 6 inches: channery silt loam
H2 - 6 to 16 inches: very channery silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 8 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

Cambridge

Percent of map unit: 5 percent
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Hydric soil rating: No

Manlius

Percent of map unit: 5 percent
Hydric soil rating: No

BOD—Bath-Nassau-Rock outcrop complex, hilly

Map Unit Setting

National map unit symbol: 9xfv
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Bath and similar soils: 40 percent
Nassau and similar soils: 25 percent
Rock outcrop: 15 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Bath

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 28 inches: gravelly loam
H3 - 28 to 48 inches: very gravelly loam
H4 - 48 to 52 inches: bedrock

Properties and qualities

Slope: 10 to 25 percent
Depth to restrictive feature: 26 to 38 inches to fragipan; 40 to 80 inches to lithic bedrock
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 24 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 6 inches: channery silt loam
H2 - 6 to 16 inches: very channery silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 10 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydric soil rating: Unranked

Minor Components

Manlius

Percent of map unit: 5 percent
Hydric soil rating: No

Mardin
Percent of map unit: 5 percent
Hydric soil rating: No

Hudson
Percent of map unit: 5 percent
Hydric soil rating: No

Volusia
Percent of map unit: 5 percent
Hydric soil rating: No

Cc—Canandaigua silt loam

Map Unit Setting
National map unit symbol: 9xfz
Elevation: 100 to 1,000 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Canandaigua and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canandaigua

Setting
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile
H1 - 0 to 9 inches: silt loam
H2 - 9 to 37 inches: silt loam
H3 - 37 to 60 inches: silt loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY010NY - Wet Lake Plain Depression
Hydric soil rating: Yes

Minor Components

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Raynham

Percent of map unit: 5 percent
Hydric soil rating: No

Lamson

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Lyons

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Cd—Canandaigua silt loam, till substratum

Map Unit Setting

National map unit symbol: 9xg0
Elevation: 100 to 1,200 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Canandaigua and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Canandaigua

Setting

Landform: Depressions

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey glaciolacustrine deposits

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 37 inches: silt loam
H3 - 37 to 40 inches: silt loam
H4 - 40 to 60 inches: gravelly silt loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F101XY010NY - Wet Lake Plain Depression
Hydric soil rating: Yes

Minor Components

Lyons

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Lamson

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Atherton

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Raynham

Percent of map unit: 5 percent
Hydric soil rating: No

CnB—Chenango gravelly silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xg8
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Chenango and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile

H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 35 inches: gravelly silt loam
H3 - 35 to 80 inches: extremely gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Hoosic
Percent of map unit: 5 percent
Hydric soil rating: No

Bath
Percent of map unit: 5 percent
Hydric soil rating: No

Castile
Percent of map unit: 5 percent
Hydric soil rating: No

Valois
Percent of map unit: 5 percent
Hydric soil rating: No

CnC—Chenango gravelly silt loam, 8 to 15 percent slopes

Map Unit Setting
National map unit symbol: 9xg9
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Chenango and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chenango

Setting
Landform: Terraces, valley trains
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from sandstone, shale, and siltstone

Typical profile
H1 - 0 to 9 inches: gravelly silt loam
H2 - 9 to 35 inches: gravelly silt loam
H3 - 35 to 80 inches: extremely gravelly sand

Properties and qualities
Slope: 8 to 15 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 1 percent
Available water supply, 0 to 60 inches: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

Percent of map unit: 5 percent
Hydric soil rating: No

Valois

Percent of map unit: 5 percent
Hydric soil rating: No

Bath

Percent of map unit: 5 percent
Hydric soil rating: No

Hoosic

Percent of map unit: 5 percent
Hydric soil rating: No

FAE—Farmington-Rock outcrop complex, steep

Map Unit Setting

National map unit symbol: 9xgf
Elevation: 100 to 900 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Farmington and similar soils: 45 percent
Rock outcrop: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Farmington

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits

Typical profile

O - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 6 inches: gravelly silt loam
H2 - 6 to 16 inches: gravelly silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 60 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F140XY029NY - Rich Shallow Till Upland
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 60 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 19.98 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Lordstown

Percent of map unit: 5 percent
Hydric soil rating: No

Plainfield
Percent of map unit: 5 percent
Hydric soil rating: No

Stockbridge
Percent of map unit: 5 percent
Hydric soil rating: No

Valois
Percent of map unit: 5 percent
Hydric soil rating: No

Nassau
Percent of map unit: 5 percent
Hydric soil rating: No

GP—Gravel pit

Map Unit Setting
National map unit symbol: 9xgh
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Gravel pit: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gravel Pit

Properties and qualities
Slope: 0 to 15 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Somewhat excessively drained

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Pompton
Percent of map unit: 5 percent
Hydric soil rating: No

Atherton
Percent of map unit: 5 percent
Landform: Depressions

Hydric soil rating: Yes

Hoosic

Percent of map unit: 5 percent
Hydric soil rating: No

Chenango

Percent of map unit: 5 percent
Hydric soil rating: No

HuB—Hudson silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xgs
Elevation: 300 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hudson and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 25 inches: silty clay loam
H3 - 25 to 38 inches: silty clay
H4 - 38 to 60 inches: stratified silty clay to silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately 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 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent

Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Churchville

Percent of map unit: 5 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Cayuga

Percent of map unit: 5 percent
Hydric soil rating: No

HuC—Hudson silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 9xgt
Elevation: 300 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hudson and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 7 inches: silt loam
H2 - 7 to 25 inches: silty clay loam
H3 - 25 to 38 inches: silty clay

H4 - 38 to 60 inches: stratified silty clay to silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately 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 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Churchville

Percent of map unit: 5 percent
Hydric soil rating: No

Schoharie

Percent of map unit: 5 percent
Hydric soil rating: No

Cayuga

Percent of map unit: 5 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

HwD—Hudson and Schoharie soils, 15 to 25 percent slopes

Map Unit Setting

National map unit symbol: 2xggt
Elevation: 0 to 1,660 feet
Mean annual precipitation: 31 to 57 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 100 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Hudson and similar soils: 40 percent
Schoharie and similar soils: 35 percent

Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hudson

Setting

Landform: Lake terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 5 inches: silty clay loam
H2 - 5 to 10 inches: silty clay loam
H3 - 10 to 36 inches: silty clay
H4 - 36 to 60 inches: clay

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
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 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Available water supply, 0 to 60 inches: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C/D
Ecological site: F140XY018NY - Moist Lake Plain
Hydric soil rating: No

Description of Schoharie

Setting

Landform: Lake terraces
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Red clayey glaciolacustrine deposits derived from calcareous shale

Typical profile

Ap - 0 to 8 inches: silty clay loam
E - 8 to 11 inches: silt loam
Bt/E - 11 to 18 inches: silty clay
Bt - 18 to 33 inches: clay
C1 - 33 to 52 inches: silty clay
C2 - 52 to 79 inches: silty clay

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Available water supply, 0 to 60 inches: High (about 9.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: F101XY009NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Cazenovia

Percent of map unit: 7 percent
Landform: Till plains, reworked lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Odessa

Percent of map unit: 7 percent
Landform: Lake terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Riser
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Cayuga

Percent of map unit: 6 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest, tread
Down-slope shape: Concave
Across-slope shape: Convex
Hydric soil rating: No

Collamer

Percent of map unit: 5 percent
Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex

Hydric soil rating: No

Ma—Madalin silty clay loam

Map Unit Setting

National map unit symbol: 9xh7
Elevation: 330 to 2,460 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Madalin and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Madalin

Setting

Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 13 inches: silty clay loam
H2 - 13 to 45 inches: silty clay
H3 - 45 to 60 inches: stratified silty clay to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly 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 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Minor Components

Canandaigua
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Rhinebeck
Percent of map unit: 5 percent
Hydric soil rating: No

Palms
Percent of map unit: 5 percent
Landform: Swamps, marshes
Hydric soil rating: Yes

Odessa
Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: No

MgB—Mardin-Nassau complex, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 2v30k
Elevation: 330 to 2,460 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Mardin and similar soils: 55 percent
Nassau and similar soils: 25 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mardin

Setting
Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Interfluve, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till

Typical profile
Ap - 0 to 8 inches: gravelly silt loam
Bw - 8 to 15 inches: gravelly silt loam
E - 15 to 20 inches: gravelly silt loam

Bx - 20 to 72 inches: gravelly silt loam

Properties and qualities

Slope: 3 to 8 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: 14 to 26 inches to fragipan
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 13 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 6 inches: channery silt loam
H2 - 6 to 16 inches: very channery silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Manlius

Percent of map unit: 5 percent

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Shoulder, footslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, linear
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Landform: Mountains, hills
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Interfluve, base slope, side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Churchville

Percent of map unit: 5 percent
Landform: Till plains, lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope, base slope, tread
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Schoharie

Percent of map unit: 5 percent
Landform: Lake plains
Landform position (two-dimensional): Summit, footslope
Landform position (three-dimensional): Side slope, tread
Down-slope shape: Concave
Across-slope shape: Convex, linear
Hydric soil rating: No

NBF—Nassau-Bath-Rock outcrop complex, very steep

Map Unit Setting

National map unit symbol: 9xhh
Elevation: 600 to 1,800 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Nassau and similar soils: 35 percent
Bath and similar soils: 25 percent
Rock outcrop: 20 percent
Minor components: 20 percent

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

Description of Nassau

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Channery loamy till derived mainly from local slate or shale

Typical profile

H1 - 0 to 6 inches: channery silt loam
H2 - 6 to 16 inches: very channery silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 65 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Bath

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till derived mainly from gray and brown siltstone, sandstone, and shale

Typical profile

H1 - 0 to 6 inches: gravelly silt loam
H2 - 6 to 28 inches: gravelly loam
H3 - 28 to 48 inches: very gravelly loam
H4 - 48 to 52 inches: bedrock

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: 26 to 38 inches to fragipan; 40 to 80 inches to lithic bedrock
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 24 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Ecological site: F140XY030NY - Well Drained Dense Till
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydric soil rating: Unranked

Minor Components

Hoosic

Percent of map unit: 5 percent
Hydric soil rating: No

Valois

Percent of map unit: 5 percent
Hydric soil rating: No

Arnot

Percent of map unit: 5 percent
Hydric soil rating: No

Manlius

Percent of map unit: 5 percent
Hydric soil rating: No

RhA—Rhinebeck silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9xj5
Elevation: 80 to 1,000 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rhinebeck

Setting

Landform: Lake plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Clayey and silty glaciolacustrine deposits

Typical profile

H1 - 0 to 10 inches: silt loam
H2 - 10 to 35 inches: silty clay loam
H3 - 35 to 50 inches: stratified silty clay to silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly 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 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Available water supply, 0 to 60 inches: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: F144AY018NY - Moist Lake Plain

Hydric soil rating: No

Minor Components

Cayuga

Percent of map unit: 5 percent
Hydric soil rating: No

Madalin

Percent of map unit: 5 percent
Landform: Depressions
Hydric soil rating: Yes

Hudson

Percent of map unit: 5 percent
Hydric soil rating: No

Churchville

Percent of map unit: 5 percent
Hydric soil rating: No

SmB—Stockbridge-Farmington gravelly silt loams, 3 to 8 percent slope

Map Unit Setting

National map unit symbol: 9xjm
Elevation: 100 to 2,460 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Stockbridge and similar soils: 50 percent
Farmington and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stockbridge

Setting

Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy till

Typical profile

H1 - 0 to 7 inches: gravelly silt loam
H2 - 7 to 34 inches: gravelly silt loam
H3 - 34 to 56 inches: gravelly silt loam
H4 - 56 to 60 inches: bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F142XB012VT - Rich Till Upland
Hydric soil rating: No

Description of Farmington

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits

Typical profile

O - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 6 inches: gravelly silt loam
H2 - 6 to 16 inches: gravelly silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: D
Ecological site: F140XY029NY - Rich Shallow Till Upland
Hydric soil rating: No

Minor Components

Valois
Percent of map unit: 5 percent
Hydric soil rating: No

Mardin
Percent of map unit: 5 percent
Hydric soil rating: No

Bath
Percent of map unit: 5 percent
Hydric soil rating: No

Volusia
Percent of map unit: 5 percent
Hydric soil rating: No

STD—Stockbridge-Farmington-Rock outcrop complex, hilly

Map Unit Setting
National map unit symbol: 9xjp
Elevation: 100 to 2,460 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition
Stockbridge and similar soils: 31 percent
Farmington and similar soils: 29 percent
Rock outcrop: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stockbridge

Setting
Landform: Till plains, hills, drumlinoid ridges
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Calcareous loamy till

Typical profile
H1 - 0 to 7 inches: gravelly silt loam
H2 - 7 to 34 inches: gravelly silt loam
H3 - 34 to 56 inches: gravelly silt loam
H4 - 56 to 60 inches: bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 40 to 80 inches to lithic bedrock
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water supply, 0 to 60 inches: Moderate (about 8.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Ecological site: F142XB012VT - Rich Till Upland
Hydric soil rating: No

Description of Farmington

Setting

Landform: Till plains, ridges, benches
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits

Typical profile

O - 0 to 1 inches: slightly decomposed plant material
H1 - 1 to 6 inches: gravelly silt loam
H2 - 6 to 16 inches: gravelly silt loam
H3 - 16 to 20 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Available water supply, 0 to 60 inches: Very low (about 2.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F140XY029NY - Rich Shallow Till Upland
Hydric soil rating: No

Description of Rock Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 0 inches to lithic bedrock
Capacity of the most limiting layer to transmit water (Ksat): Very low to very high (0.00 to 19.98 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydric soil rating: Unranked

Minor Components

Valois

Percent of map unit: 5 percent
Hydric soil rating: No

Mardin

Percent of map unit: 5 percent
Hydric soil rating: No

Rhinebeck

Percent of map unit: 5 percent
Hydric soil rating: No

Volusia

Percent of map unit: 5 percent
Hydric soil rating: No

TkB—Tunkhannock gravelly loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xjx
Elevation: 700 to 2,000 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Tunkhannock and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tunkhannock

Setting

Landform: Terraces, valley trains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Gravelly loamy glaciofluvial deposits over sandy and gravelly glaciofluvial deposits, derived mainly from reddish sandstone, siltstone, and shale

Typical profile

H1 - 0 to 7 inches: gravelly loam
H2 - 7 to 23 inches: gravelly loam
H3 - 23 to 30 inches: very gravelly loam
H4 - 30 to 80 inches: Error

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F140XY021NY - Dry Outwash
Hydric soil rating: No

Minor Components

Castile

Percent of map unit: 5 percent
Hydric soil rating: No

Red hook

Percent of map unit: 5 percent
Hydric soil rating: No

Suncook

Percent of map unit: 5 percent
Hydric soil rating: No

Barbour

Percent of map unit: 5 percent
Hydric soil rating: No

Wb—Wayland soils complex, non-calcareous substratum, 0 to 3 percent slopes, frequently flooded

Map Unit Setting

National map unit symbol: 2srgt
Elevation: 160 to 1,970 feet
Mean annual precipitation: 31 to 70 inches
Mean annual air temperature: 43 to 52 degrees F
Frost-free period: 105 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Wayland and similar soils: 60 percent
Wayland, very poorly drained, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wayland

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

Ap - 0 to 9 inches: silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: FrequentNone
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F140XY015NY - Wet Low Floodplain
Hydric soil rating: Yes

Description of Wayland, Very Poorly Drained

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty and clayey alluvium derived from interbedded sedimentary rock

Typical profile

A - 0 to 9 inches: mucky silt loam
Bg - 9 to 21 inches: silt loam
Cg1 - 21 to 28 inches: silt loam
Cg2 - 28 to 47 inches: silt loam
Cg3 - 47 to 54 inches: silt loam
Cg4 - 54 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 13.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F140XY015NY - Wet Low Floodplain
Hydric soil rating: Yes

Minor Components

Holderton

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

WsB—Williamson silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9xkm
Elevation: 160 to 1,970 feet
Mean annual precipitation: 41 to 62 inches
Mean annual air temperature: 41 to 50 degrees F
Frost-free period: 110 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Williamson and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Williamson

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Glaciolacustrine or eolian deposits with a high content of silt and very fine sand

Typical profile

H1 - 0 to 8 inches: silt loam
H2 - 8 to 18 inches: silt loam
H3 - 18 to 42 inches: very fine sandy loam
H4 - 42 to 52 inches: stratified silt loam to silty clay loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 24 inches to fragipan
Drainage class: Moderately 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 14 to 23 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: D
Ecological site: F144AY018NY - Moist Lake Plain
Hydric soil rating: No

Minor Components

Riverhead

Percent of map unit: 5 percent
Hydric soil rating: No

Unadilla

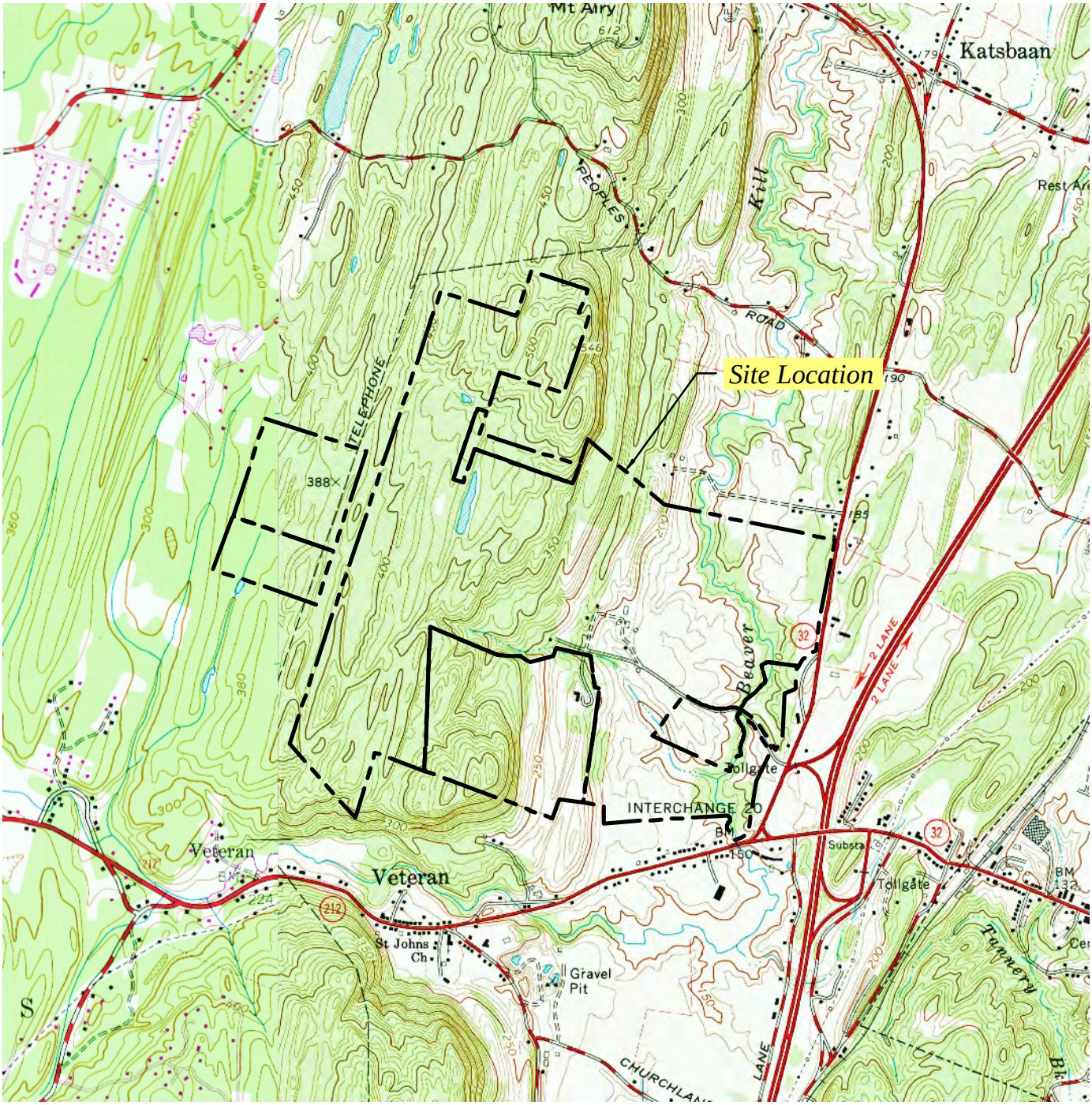
Percent of map unit: 5 percent
Hydric soil rating: No

Hudson

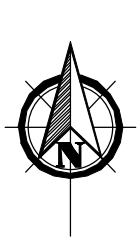
Percent of map unit: 5 percent
Hydric soil rating: No

Schoharie

Percent of map unit: 5 percent
Hydric soil rating: No



SOURCE: USGS TOPOGRAPHIC QUADRANGLES SAUGERTIES (PHOTOINSPECTED 1978) AND WOODSTOCK (PHOTOREVISED 1980), NEW YORK.



QUADRANGLE LOCATION

0 2000

SCALE IN FEET

VILLAGE OF SAUGERTIES
WINSTON FARM PROPERTY
SAUGERTIES, NEW YORK

SITE LOCATION MAP

DATE	REVISED

PREPARED BY
LBG HYDROGEOLOGIC & ENGINEERING SERVICES, P.C.
Professional Geologists & Environmental Engineers
Member of WSP
4 Research Drive
Suite 204
Shelton, Connecticut 06484
(203) 929-8555

DRAWN:	RAC	CHECKED:	SS	DATE:	06/06/18	FIGURE:	1

N

LEGEND

- PROPERTY BOUNDARY
- PUMPING WELL
- MONITORING WELL
- TW-1 DISCHARGE

0 400

SCALE IN FEET

VILLAGE OF SAUGERTIES
WINSTON FARM PROPERTY
SAUGERTIES, NEW YORK

SITE MAP

DATE	REVISED

PREPARED BY:
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Suite 204
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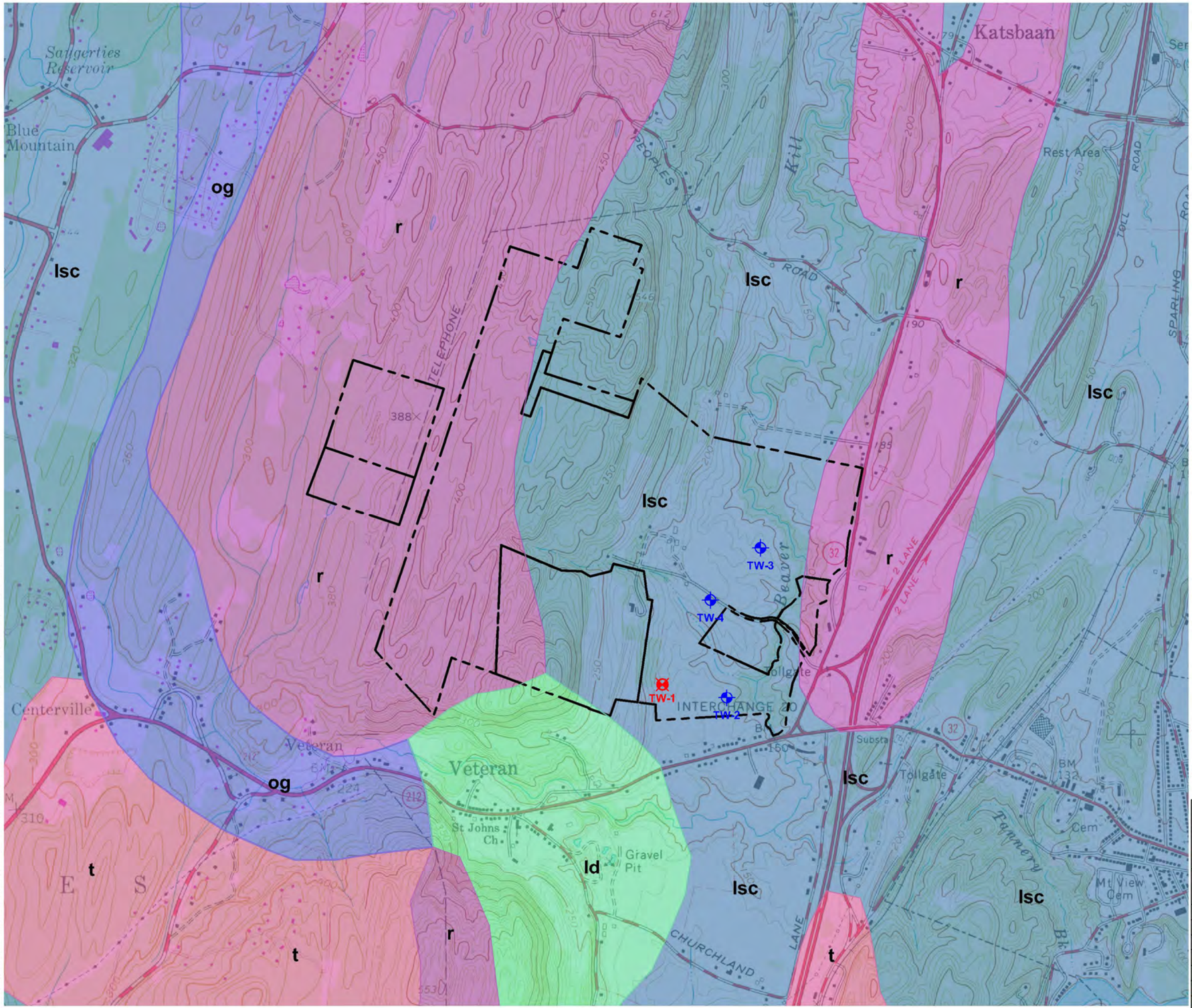
(203) 929-8555

DRAWN:	RAC	CHECKED:	SS	DATE:	06/06/18	FIGURE:	2



LEGEND

- PROPERTY BOUNDARY
- PUMPING WELL
- MONITORING WELL
- ld — LACUSTRINE DELTA
- lsc — LACUSTRINE SILT AND CLAY
- og — OUTWASH SAND AND GRAVL
- r — BEDROCK, EXPOSED OR GENERALLY WITHIN 1 METER OF SURFACE
- t — TILL

0 1,500
SCALE IN FEET

VILLAGE OF SAUGERTIES
WINSTON FARM PROPERTY
SAUGERTIES, NEW YORK

SURFICIAL GEOLOGY

DATE	REVISED

PREPARED BY:
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DRAWN:	RAC	CHECKED:	SS	DATE:	06/14/18	FIGURE:	3

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APPENDIX I

GEOLOGIC LOG **LBGHES – MEMBER OF WSP** **SHELTON, CONNECTICUT**	**OWNER:** Village of Saugerties **BORING NO:** TW-1 **PAGE** 1 **OF** 2 **PAGES**

SITE LOCATION: The Winston Farm 119 Augusta Savage Rd, Saugerties, NY 12477	**SCREEN SIZE & TYPE:** 10' SS **SLOT NO:** 10 **SETTING:** 94.5-104.5 ft. BG
DATE COMPLETED: 4/19 - 4/23/2018	**SAND PACK SIZE & TYPE:** #2
DRILLING COMPANY: Aquifer Drilling and Testing	**SETTING:** 93-105 ft. BG
	CASING SIZE & TYPE: 6" PVC
DRILLING METHOD: Sonic	**SETTING:** Stickup – 95 ft. BG
SAMPLING METHOD: 10 ft. Sonic Core	**SEAL TYPE:** Bentonite Chips
OBSERVER: Brian Mocci	**SETTING:** 92-93 ft. BG
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Natural
ELEVATION OF RP: ---	**STATIC WATER LEVEL:**
STICK-UP:	**DEVELOPMENT METHOD:**
SURFACE COMPLETION: Stick up	**DURATION:** **YIELD:**
REMARKS:	
GPS COORDINATES:	
ABBREVIATIONS: SS = split spoon W = wash C = cuttings G = grab SC = sonic core REC = recovery PPM = parts per million	

DEPTH (FEET) FROM	DEPTH (FEET) TO	SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
0	10	SC	-	10.0	-	CLAY; dark brown
10	20	SC	-	7.6	-	CLAY; dark gray
20	30	SC	-	9.0	-	CLAY; dark gray
30	40	SC	-	9.7	-	CLAY; some silt; dark gray
40	50	SC	-	10.0	-	CLAY; some silt; dark gray
50	60	SC	-	8.0	-	CLAY; some silt; dark gray
60	70	SC	-	9.1	-	CLAY; some silt; dark gray
70	80	SC	-	7.0	-	CLAY; some silt; dark gray
80	90	SC	-	8.5	-	0-6' CLAY; some silt; dark gray 6-8.5' SAND, very fine; trace silt; trace clay; dark gray

OWNER: Village of Saugerties

WELL NO.: TW-1 **PAGE** 2 **OF** 2 **PAGES**

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
90	100	SC	-	9.3	-	0-3' SAND, very fine to medium; some gravel, fine to very coarse trace silt; dark gray 3-9.3' GRAVEL, fine to very coarse; trace sand, very fine to fine; trace silt; dark gray
100	110	SC	-	7.0	-	0-4.5' GRAVEL, fine to very coarse; trace sand, very fine to fine; trace silt; dark gray 4.5-7' BEDROCK – Borehole terminated at 107' BG

GEOLOGIC LOG **LBGHES – MEMBER OF WSP** **SHELTON, CONNECTICUT**	**OWNER:** Village of Saugerties **BORING NO:** TW-2 **PAGE** 1 **OF** 2 **PAGES**

SITE LOCATION: The Winston Farm 119 Augusta Savage Rd, Saugerties, NY 12477	**SCREEN SIZE & TYPE:** 5' SS **SLOT NO:** 10 **SETTING:** 135-140 ft. BG
DATE COMPLETED: 4/24 – 4/26/2018	**SAND PACK SIZE & TYPE:** #2
DRILLING COMPANY: Aquifer Drilling and Testing	**SETTING:** 133-140 ft. BG
	CASING SIZE & TYPE: 6" PVC
DRILLING METHOD: Sonic	**SETTING:** Stickup – 135 ft. BG
SAMPLING METHOD: 10 ft. Sonic Core	**SEAL TYPE:** Bentonite Chips
OBSERVER: Brian Mocci	**SETTING:** 132-133 ft. BG
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Natural
ELEVATION OF RP: ---	**STATIC WATER LEVEL:**
STICK-UP:	**DEVELOPMENT METHOD:**
SURFACE COMPLETION: Stick up	**DURATION:** **YIELD:**
REMARKS:	
GPS COORDINATES:	
ABBREVIATIONS: SS = split spoon W = wash C = cuttings G = grab SC = sonic core REC = recovery PPM = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
0	10	SC	-	6.5	-	CLAY; dark brown
10	20	SC	-	9.0	-	CLAY; dark gray
20	30	SC	-	8.7	-	CLAY; some silt; dark gray
30	40	SC	-	10.0	-	CLAY; some silt; dark gray
40	50	SC	-	9.2	-	CLAY; some silt; dark gray
50	60	SC	-	8.8	-	CLAY; some silt; dark gray
60	70	SC	-	9.5	-	CLAY; some silt; dark gray
70	80	SC	-	9.4	-	CLAY; some silt; dark gray
80	90	SC	-	0	-	No Recovery
90	100	SC	-	8.0	-	CLAY; some silt; dark gray

OWNER: Village of Saugerties

WELL NO.: TW-2 **PAGE** 2 **OF** 2 **PAGES**

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
100	110	SC	-	9.4	-	0-5' CLAY; some silt; dark gray 5-9.4' SAND, very fine to fine; trace silt; dark gray
110	120	SC	-	9.0	-	0-6' SAND, very fine to fine; trace silt; dark gray 6-9' SAND, fine; little gravel, fine to very coarse; dark gray
120	130	SC	-	8.7	-	SAND, very fine to medium; some clay thinly interbedded; dark gray
130	140	SC	-	9.8	-	0-7' SAND, very fine to medium; some clay thinly interbedded; dark gray 7-9.8 GRAVEL, fine to very coarse; some sand, very fine to fine; trace silt; dark gray Refusal on rock at 140' BG

GEOLOGIC LOG **LBGHES – MEMBER OF WSP** **SHELTON, CONNECTICUT**	**OWNER:** Village of Saugerties **BORING NO:** TW-3 **PAGE** 1 **OF** 2 **PAGES**

SITE LOCATION: The Winston Farm 119 Augusta Savage Rd, Saugerties, NY 12477	**SCREEN SIZE & TYPE:** 10' SS **SLOT NO:** 10 **SETTING:** 145-155 ft. BG
DATE COMPLETED: 4/27 – 5/1/2018	**SAND PACK SIZE & TYPE:** #2
DRILLING COMPANY: Aquifer Drilling and Testing	**SETTING:** 143-155 ft. BG
	CASING SIZE & TYPE: 6" PVC
DRILLING METHOD: Sonic	**SETTING:** Stickup – 145 ft. BG
SAMPLING METHOD: 10 ft. Sonic Core	**SEAL TYPE:** Bentonite Chips
OBSERVER: Brian Mocci	**SETTING:** 142-143 ft. BG
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Natural
ELEVATION OF RP: ---	**STATIC WATER LEVEL:**
STICK-UP:	**DEVELOPMENT METHOD:**
SURFACE COMPLETION: Stick up	**DURATION:** **YIELD:**
REMARKS:	
GPS COORDINATES:	
ABBREVIATIONS: SS = split spoon W = wash C = cuttings G = grab SC = sonic core REC = recovery PPM = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
0	10	SC	-	9.7	-	CLAY; dark brown
10	20	SC	-	8.8	-	CLAY; dark gray
20	30	SC	-	9.5	-	CLAY; some silt; dark gray
30	40	SC	-	10.0	-	CLAY; some silt; dark gray
40	50	SC	-	9.6	-	CLAY; some silt; dark gray
50	60	SC	-	9.5	-	CLAY; some silt; dark gray
60	70	SC	-	10.0	-	CLAY; some silt; dark gray
70	80	SC	-	9.7	-	CLAY; some silt; dark gray
80	90	SC	-	9.2	-	CLAY; some silt; dark gray
90	100	SC	-	8.0	-	SAND, very fine; trace silt; some clay thinly interbedded; dark gray

OWNER: Village of Saugerties

WELL NO.: TW-3 **PAGE** 2 **OF** 2 **PAGES**

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
100	110	SC	-	9.3	-	SAND, very fine; trace silt; some clay thinly interbedded; dark gray
110	120	SC	-	9.7	-	SAND, very fine; trace silt; some clay thinly interbedded; dark gray
120	130	SC	-	8.7	-	SAND, fine; trace silt; some clay thinly interbedded; dark gray
130	140	SC	-	9.8	-	SAND, fine; trace silt; some clay thinly interbedded; dark gray
140	150	SC	-	9.0	-	0-7' SAND, fine; trace silt; some clay thinly interbedded; dark gray 7-9' GRAVEL, fine to very coarse; some sand, fine; trace silt; dark gray
150	160	SC	-	9.0	-	0-4' GRAVEL, fine to very coarse; some sand, fine; trace silt; dark gray 4-9' SAND, fine; some silt; dark gray
160	170	SC	-	8.0	-	SAND, fine; some silt; dark gray Refusal on rock at 168' BG

GEOLOGIC LOG **LBGHES – MEMBER OF WSP** **SHELTON, CONNECTICUT**	**OWNER:** Village of Saugerties **BORING NO:** TW-4 **PAGE** 1 **OF** 2 **PAGES**

SITE LOCATION: The Winston Farm 119 Augusta Savage Rd, Saugerties, NY 12477	**SCREEN SIZE & TYPE:** 10' SS **SLOT NO:** 10 **SETTING:** 135.5-145.5 ft. BG
DATE COMPLETED: 5/2 – 5/7/2018	**SAND PACK SIZE & TYPE:** #2
DRILLING COMPANY: Aquifer Drilling and Testing	**SETTING:** 133-145 ft. BG
	CASING SIZE & TYPE: 6" PVC
DRILLING METHOD: Sonic	**SETTING:** Stickup – 135 ft. BG
SAMPLING METHOD: 10 ft. Sonic Core	**SEAL TYPE:** Bentonite Chips
OBSERVER: Brian Mocci	**SETTING:** 132-133 ft. BG
REFERENCE POINT (RP): Grade	**BACKFILL TYPE:** Natural
ELEVATION OF RP: ---	**STATIC WATER LEVEL:**
STICK-UP:	**DEVELOPMENT METHOD:**
SURFACE COMPLETION: Stick up	**DURATION:** **YIELD:**
REMARKS:	
GPS COORDINATES:	
ABBREVIATIONS: SS = split spoon W = wash C = cuttings G = grab SC = sonic core REC = recovery PPM = parts per million	

DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
0	10	SC	-	9.5	-	CLAY; dark brown
10	20	SC	-	8.9	-	CLAY; dark gray
20	30	SC	-	9.1	-	CLAY; some silt; dark gray
30	40	SC	-	9.8	-	CLAY; some silt; dark gray
40	50	SC	-	10.0	-	CLAY; some silt; dark gray
50	60	SC	-	10.0	-	CLAY; some silt; dark gray
60	70	SC	-	10.0	-	CLAY; some silt; dark gray
70	80	SC	-	9.4	-	CLAY; some silt; dark gray
80	90	SC	-	9.1	-	CLAY; some silt; dark gray
90	100	SC	-	9.0	-	CLAY; some silt; dark gray

OWNER: Village of Saugerties

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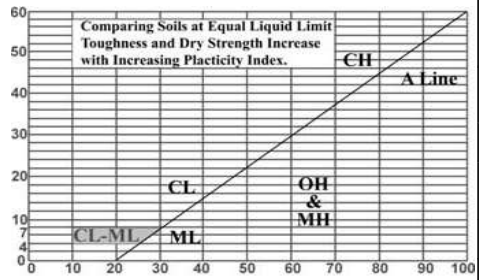
DEPTH (FEET)		SAMPLE TYPE	BLOW COUNT	REC. (FEET)	PID READING (PPM)	DESCRIPTION
FROM	TO					
100	110	SC	-	7.3	-	CLAY; some silt; dark gray
110	120	SC	-	8.8	-	CLAY; some silt; dark gray
120	130	SC	-	9.7	-	CLAY; some silt; trace sand, very fine; dark gray
130	140	SC	-	9.4	-	SAND, very fine to fine; trace silt; some clay thinly interbedded; dark gray
140	150	SC	-	8.0	-	0-5.5' GRAVEL, fine to very coarse; some sand, very fine to fine; trace silt; dark gray Rock at 145.5' BG

TABLE 11-1 UNIFIED SOIL CLASSIFICATION
(Including Identification and Description)

Major Divisions		Group Symbols	Typical Names	Field Identification Procedures (Excluding particles larger than 3 in. and basing fractions on estimated weights)			Information Required for Describing Soils	Laboratory Classification Criteria
1	2	3	4	5			6	7
Coarse-grained Soils More than half of material is *larger* than No. 200 sieve size. The No. 200 sieve size is about the smallest visible to the naked eye.	Gravels More than half of coarse fraction is larger than No. 4 sieve size. (For visual classification, the ¼-in. size may be used as equivalent to the No. 4 sieve size.) — Clean Gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixture, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.			For undisturbed soils add information on stratification, degree of compactness, cementation, moisture condition, and drainage characteristics. Give typical name; indicate approximate percentages of sand and gravel, maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbol in parentheses. Example: Silty sand, gravelly; about 20% hard, angular gravel particles ½-in. maximum size; rounded and subangular sand grains, coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM).	Use grain-size curve in identifying the fractions as given under field identification. Determine percentage of gravel and sand from grain-size curve. Depending on percentage of fine (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows: Less than 5% GW, GP, SW, SP, More than 12% GM, GC, SM, SC. 5% to 12% Borderline cases requiring use of dual symbols.
		GP	Poorly graded gravels or gravel-sand mixture, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.				$C_u = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for GW
	— Gravels with Fines (Appreciable amount of fines)	GM	Silty gravels, gravel-and-silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).				Atterberg limits below "A" line or P1 less than 4 — Above "A" line with P1 between 4 and 7 are borderline cases requiring use of dual symbols.
		GC	Clayey gravels, gravel-and-clay mixtures.	Plastic fines (for identification procedures see CL below).				Atterberg limits above "A" line with P1 greater than 7
	Sands More than half of coarse fraction is smaller than No.4 sieve size. — Clean Sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.				$C_u = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for SW
		SP	Poorly graded sands or gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.				Atterberg limits above "A" line or P1 less than 4 — Limits plotting in hatched zone with P1 between 4 and 7 are borderline cases requiring use of dual symbols.
	— Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity (for identification procedures see ML below).				Atterberg limits above "A" line with Pl greater than 7
		SC	Clayey sands, sand-clay mixtures.	Plastic fines (for identification procedures see CL below).				
Fine-grained Soils More than half of material is *smaller* than No. 200 sieve size.				Identification Procedure on Fraction Smaller than No. 40 Sieve Size.				
				Dry Strength (Crushing Characteristics)	Dilatancy (Reaction to shaking)	Toughness (Consistency near PL)		
	Silts and Clays Liquid limit is less than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	None to slight	Quick to slow	None	For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions Give typical name; indicate degree and character of plasticity; amount and maximum size of coarse grains; color in wet condition; odor, if any; local or geologic name and other pertinent descriptive information; and symbol in parentheses. Example: Clayey silt, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (ML)	Plasticity Index  LIQUID LIMIT PLASTICITY CHART For Laboratory classification of fine-grained soils
	Silts and Clays Liquid limit is greater than 50	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high	None to very slow	Medium		
		OL	Organic silts and organic silty clays of low plasticity.	Slight to medium	Slow	Slight		
		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	Slight to medium	Slow to none	Slight to medium		
		CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High		
		OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium		
Highly Organic Soils		Pt	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture				

(1) Boundary classifications: Soils possessing characteristics of two groups are designed by combinations of group symbols. For example GM-GC, well-graded gravel-sand mixture with clay binder.
(2) All sieve sizes on this chart are U.S. standard.
(3) Adopted by Corps of Engineers and Bureau of Reclamation, January 1952

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Soil Characteristics Pertinent to Roads and Airfields

Major Divisions		Letter (1)	Name	Value as Subgrade When Not Subject to Frost Action	Value as Subbase When Not Subject to Frost Action	Value as Base When Not Subject to Frost Action	Potential Frost Action	Compressibility and Expansion	Drainage Characteristics	Compaction Equipment	Unit Dry Weight lb. per cu. ft.	Typical Design Values	
												CBR (2)	Subgrade Modulus k lb. per cu. in.
Coarse-Grained Soils	Gravel and Gravelly soils	GW	Well-graded gravels or gravel-sand mixtures, little or no fines	Excellent	Excellent	Good	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired roller, steel-wheeled roller	125-140	40-80	300-500
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines	Good to excellent	Good	Fair to good	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired roller, steel-wheeled roller	110-140	30-60	300-500
		GM d	Silty gravels, gravel-sand-silt mixtures	Good to excellent	Good	Fair to good	Slight to medium	Very slight	Fair to poor	Rubber-tired roller, sheepsfoot roller; close control of moisture	125-145	40-60	300-500
		GM u		Good	Fair	Poor to not suitable	Slight to medium	Slight	Poor to practically impervious	Rubber-tired roller, sheepsfoot roller	115-135	20-30	200-500
		GC	Clayey gravels, gravel-sand-clay mixtures	Good	Fair	Poor to not suitable	Slight to medium	Slight	Poor to practically impervious	Rubber-tired roller, sheepsfoot roller	130-145	20-40	200-500
	Sand and Sandy soils	SW	Well-graded sands or gravelly sands, little or no fines	Good	Fair to good	Poor	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired roller	110-130	20-40	200-400
		SP	Poorly graded sands or gravelly sands, little or no fines	Fair to good	Fair	Poor to not suitable	None to very slight	Almost none	Excellent	Crawler-type tractor, rubber-tired roller	105-135	10-40	150-400
		SM d	Silty sands, sand-silt mixtures	Fair to good	Fair to good	Poor	Slight to high	Very slight	Fair to poor	Rubber-tired roller, sheepsfoot roller; close control of moisture	120-135	15-40	150-400
		SM u		Fair	Poor to fair	Not suitable	Slight to high	Slight to medium	Poor to practically impervious	Rubber-tired roller, sheepsfoot roller	100-130	10-20	100-300
		SC	Clayey sands, sand-clay mixtures	Poor to fair	Poor	Not suitable	Slight to high	Slight to medium	Poor to practically impervious	Rubber-tired roller, sheepsfoot roller	100-135	5-20	100-300
Fine-Grained Soils	Silts and Clays LL is less than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Poor to fair	Not suitable	Not suitable	Medium to very high	Slight to medium	Fair to poor	Rubber-tired roller, sheepsfoot roller; close control of moisture	90-130	15 or less	100-200
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Poor to fair	Not suitable	Not suitable	Medium to high	Medium	Practically impervious	Rubber-tired roller, sheepsfoot roller	90-130	15 or less	50-150
		OL	Organic silts and organic silt-clays of low plasticity	Poor	Not suitable	Not suitable	Medium to high	Medium to high	Poor	Rubber-tired roller, sheepsfoot roller	90-105	5 or less	50-100
	Silts and Clays LL is Greater than 50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	Poor	Not suitable	Not suitable	Medium to very high	High	Fair to poor	Sheepsfoot roller, rubber-tired roller	80-105	10 or less	50-100
		CH	Inorganic clays of medium to high plasticity, organic silts	Poor to fair	Not suitable	Not suitable	Medium	High	Practically impervious	Sheepsfoot roller, rubber-tired roller	90-115	15 or less	50-150
		OH	Organic clays of high plasticity, fat clays	Poor to very poor	Not suitable	Not suitable	Medium	High	Practically impervious	Sheepsfoot roller, rubber-tired roller	80-110	5 or less	25-100
Highly Organic Soils		Pt	Peat and other highly organic soils	Not suitable	Not suitable	Not suitable	Slight	Very high	Fair to poor	Compaction not practical	—	—	—

Note:

(1) Unit Dry Weights are for compacted soil at optimum moisture content for modified AASHO compaction effort. Division of GM and SM groups into subdivision of d and u are for roads and airfields only. Subdivision is basis of Atterberg limits; suffix d (e.g., GMd) will be used when the liquid limit (LL) is 25 or less and the plasticity index is 6 or less; the suffix u will be used otherwise.

(2) The maximum value that can be used in design of airfields is, in some cases, limited by gradation and plasticity requirements.

GENERAL QUALIFICATIONS

This report has been prepared in order to aid in the evaluation of this property and to assist the architect and/or engineer in the design of this project. The scope of the project and the location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil and foundation characteristics. In the event that any changes in the design or location of the proposed facilities, as outlined in this report, are planned, we should be informed so the changes can be reviewed and the conclusions of this report modified or approved in writing by ourselves.

It is recommended that all construction operations dealing with earthwork and foundations be inspected by an experienced soil engineer to assure that design requirements are fulfilled in the actual construction. If you wish, we would welcome the opportunity to review the plans and specifications when they have been prepared so that we may have the opportunity of commenting on the effect of soil conditions on the design and specifications.

The analysis and recommendations submitted in this report are based upon the data obtained from the soil borings and/or test pits performed at the locations indicated on the location diagram and from any other information discussed in this report. This report does not reflect any variations which may occur between these borings and/or test pits. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. However, it is a well-known fact that variations in soil and rock conditions exist on most sites between boring locations and also such situations as groundwater conditions vary from time to time. The nature and extent of variations may not become evident until the course of construction. If variations then appear evident, it will be necessary for a reevaluation of the recommendations of this report after performing on-site observations during the construction period and noting the characteristics of any variations.