GEOTECHNICAL EVALUATION
SUMMIT AT FORTS FERRY
COLONIE, NEW YORK

DENTE FILE NO. JB-18-5-036

Prepared For:

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Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

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GEOTECHNICAL EVALUATION
SUMMIT AT FORTS FERRY
COLONIE, NEW YORK

Dente File No. JB185036

I. INTRODUCTION

This report presents the results of a geotechnical evaluation completed for the Summit at Forts Ferry development planned for construction in Colonie, New York. The evaluation was general completed in accord with our proposal number PFDE-18-30, which was accepted by VHB of Albany, New York.

In general, our scope of services for this project consisted of the following:

- Site reconnaissance by a Geotechnical Engineer,
- Field location and completion of 18 test borings in the proposed building areas and three site borings for stormwater management design purposes,
- Preparation of this report, which summarizes the results of our explorations and presents recommendations to assist in planning for the geotechnical related aspects of the project.

This report and the recommendations contained within it were developed for specific application to the site and construction planned, as we currently understand it. Corrections in our understanding, changes in the structure locations, their grades, loads, etc. should be brought to our attention so that we may evaluate their effect upon the recommendations offered in this report.

It should be understood that this report was prepared, in part, on the basis of a limited field exploration. The borings were advanced at discrete locations and the overburden soils sampled at specific depths. Conditions are only known at the locations and through the depths investigated. Conditions at other locations and depths may be

different, and these differences may impact upon the conclusions reached and the recommendations offered. For this reason, we strongly recommend that we be retained to provide site observation services during construction.

A sheet entitled "Important Information about this Geotechnical Engineering Report" prepared by the Geotechnical Business Council is presented following the title page of this report. This sheet should never be separated from this report and be carefully reviewed as it sets the only context within which this report should be used.

This report was prepared for informational purposes only and should not be considered part of the contract documents. It should be made available to interested parties in its entirety only. Should the data contained in this report not be adequate for the contractors' bidding purposes, the contractors may make their own investigations, tests, and analyses for use in bid preparation.

The recommendations offered in this report concerning the control of surface and subsurface waters, moisture, or vapor membranes address only conventional Geotechnical Engineering aspects and are not to be construed as recommendations for controlling or providing an environment that would prohibit or control infestations of the structure or its surroundings with mold or other biological agents.

II. SITE AND PROJECT DESCRIPTION

The project site is located at 33 and 45 Forts Ferry Road in Colonie, New York as shown on the USGS topographic map and aerial photograph for the area presented in Appendix A. The map and photograph are provided to assist the reader in locating the site and reviewing the overall topography and land use in the general project area.

The site is comprised of undeveloped woodlands and brush covered areas. Remnants of an old driveway extend from Forts Ferry Road several hundred feet into the site. The driveway previously connected to a residential development adjoining the north side of the site. The ground surface elevations slope down from a high of about 334 feet adjacent to Forts Ferry Road to a low of about 310 feet on the east side of the site. Standing water and very soft/wet surfaces were observed in the lower lying areas on the east side of the site.

Our understanding of the project is based upon the Sketch Plan prepared by VHB and dated March 30, 2018. This sketch shows the preliminary layout of buildings and pavements for the development. A reduced copy of this plan with our test boring locations marked on it is attached. As shown the development will include a two-story 15,000 SF office building, three story roughly 30,000 SF apartment building, and a series of single story parking garages.

The office building is planned near Forts Ferry Road, roughly parallel to and overlying the former driveway into the site. Ground surface elevations vary between 321 and 332 feet in the building area. The apartment building and garages are planned in the lower lying areas on the east side of the site where existing ground surface elevations are in the range of about 310 to 316 feet. No proposed floor elevations for the new structures were noted on the Sketch Plan.

No building loads for the proposed buildings were provided to us, and for the purposes of this evaluation we have assumed that isolated column and continuous wall loads for the office and apartment buildings will be less than 200 kips and three kips per linear foot, respectively. Loading for the garage structures should be significantly less.

III. SUBSURFACE CONDITIONS

The subsurface conditions at the site were investigated through a review of published County Soil Surveys and a site specific test boring program as detailed below.

A. Albany County Soil Survey Information

The surficial soils at the project site have been mapped by the Albany County Soil Survey as predominately silt loam and silty clay loam in the lower lying areas on the east side of the site and sandy loam, fine sandy loam, and silt loam on the higher elevated west side of the site. The Soil Survey indicates that expected groundwater depths are relatively shallow, about 6 to 18 inches, in the low lying areas of the site and the soils in this area are Hydrologic Soil Groups C/D. In the higher elevated areas of the site groundwater is typically expected to be deeper than 80 inches and the soils are more generally Hydrologic Soil Groups A/B.

General information and mapping obtained from the National Cooperative Web Soil Survey is presented in Appendix B.

B. Test Boring Investigation

The subsurface conditions at the site were investigated through the completion of 18 test borings in the proposed building areas and three site borings for stormwater management design purposes. Six site borings were originally planned, but three were deleted when it was found they were located in areas of the site with standing water and/or wet surfaces. The approximate test boring locations shown on the plan in Appendix B.

The test borings were completed using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the overburden soils were sampled and their relative density determined using split-spoon sampling techniques in general

accord with ASTM D1586 procedures. Representative portions of the recovered soil samples were transported to our office for visual classification by a Geotechnical Engineer. Individual subsurface logs for the test borings are presented in Appendix C along with a key to the terms used in their preparation.

The subsurface logs should be reviewed for a description of the conditions encountered at the specific test boring locations. It should be understood that conditions are only known at the depths and locations sampled. Conditions at other depths and locations may be different.

The site was found to be surfaced with about two to twelve inches of topsoil. Beneath these surface materials were stratified deposits of sand, sand and gravel, silt and clay extending to glacial till and shale bedrock.

Office Building Site

Beneath the proposed two story office building on the higher elevated west side of the site, the thickness of overburden above rock was deepest. The soil profile in this area was relatively complex in the upper 5 to 15 feet beginning with a surface layer of moist, loose, silt followed by stratified layers or seams of sand, silt and clay. Below these depths the soils were composed of sand or sand and gravel of loose to firm relative density. Glacial till, a relatively firm mix of silt with some sand and gravel, was found at a depth of about 41 feet and shale bedrock at 43 feet. This corresponds to a bedrock surface elevation near 284 feet.

Based upon measurements obtained as the borings were made and change in the degree of saturation of the recovered soil samples, it appears that groundwater was present about 10 to 14 feet below grade in this area of the site. This groundwater level may vary by several feet with seasonal fluctuations in precipitation and runoff.

Apartment Building and Garage Sites

The soils in the apartment building and garage areas in the lower lying east side of the site were composed primarily of silt or silt and clay with occasional sand layers between depths of about 5 and 15 feet. The soils were generally of a loose density or soft to very soft consistency beginning at the ground surface. Glacial till similar to that described above was found at depths of about 8 to 15 feet below grade in many of the borings in this area. Shale bedrock was found about 12 to 16 feet below grade in several borings, this corresponding to a bedrock surface elevation in the approximate range of 296 to 301 feet in this area of the site.

Based upon measurements obtained as the borings were made and change in the degree of saturation of the recovered soil samples, it appears that groundwater was

typically present about 1 to 4 feet below grade in this area of the site. During seasonal wet periods, groundwater may be found at or near the ground surface.

C. Infiltration Testing

As previously noted, three of the originally planned Infiltration test borings were deleted because they were found to be located in the low lying east side of the site where groundwater was very shallow. In the borings which were advanced, I-1, I-2, and I-6, no infiltration testing was performed because groundwater was present at or above the planned test depths.

IV. CONCLUSIONS AND RECOMMENDATIONS

A. General Site Evaluation

From a geotechnical standpoint, planning for design and construction will be impacted significantly by the presence of groundwater at or near the ground surface and soft/loose subgrade conditions on the east side of the site. We caution that preparatory earthwork in this area will be difficult as the surfaces will easily soften and loose strength under standard construction equipment traffic. With that said, we have developed the following general conclusions and recommendations to assist in planning for design and construction.

1. Groundwater may be present at or near the ground surface in the low lying areas on the east side of the site depending upon the prevailing weather conditions during and prior to construction. Further, the granular soils placed as fill and subbase will form perched water tables in these porous layers placed upon the site's soils. For these reasons, perimeter swales and or underdrains should be provided along and beneath pavements, and foundation drains along the sides of all of the perimeter foundations. In general, fills should be planned in this area to elevate the site grades beneath buildings and pavements.

2. The new office building may be supported using ordinary spread foundations bearing upon the undisturbed native soils or on structural fill placed to establish design grades. The apartment building may also be supported on spread foundations provided that they are designed for a relatively modest bearing pressure and the bearing grades are prepared as recommended in the following report sections to include a stabilizing stone base. Because bedrock is relatively shallow in the area of the apartment building, consideration may also be given to supporting the building on steel H-piles driven to end bearing on the rock.

3. Site preparation should preferably be completed during a seasonal dry period to reduce the adverse impacts of soft/wet subgrades on construction. This will minimize the quantity of undercutting that will be required to remove and

replace soft/wet soils and/or establish a stable base for construction. A contingency should be carried in the project budget for undercutting and replacement of soft/wet subgrade soils. Prior to commencing work, perimeter swales and trenches should be installed to intercept and divert runoff and shallow groundwater away from the construction areas.

4. The existing site soils which are composed of silt and/or clay will be very sensitive to construction activities and even slight variations in moisture content. For planning purposes, it should be assumed that these soils cannot be reused as a Structural fill or backfill. Soils composed of sand or sand and gravel may be encountered on the west side of the site and, where present, these soils may be considered for reuse as Structural fill or backfill.

5. In planning for the design of stormwater management systems, it should be assumed that negligible infiltration will occur into the site soils composed of silt and/or clay. It should also be assumed that groundwater way be present at or near the ground surface throughout most of the east side of the site. Some areas of more permeable sand or sand and gravel above groundwater levels are present on the west side of the site. Design of stormwater management systems may require additional investigation and testing to confirm the soil and groundwater conditions in the specific areas of interest.

The following report sections provide detailed recommendations to assist in planning for design and construction. We should review plans and specifications prior to their release for bidding to allow us to refine our recommendations, if required, and confirm that our recommendations were properly interpreted and applied.

B. Seismic Design Considerations

For seismic design purposes, we evaluated the site conditions in accord with Section 1613 of the International Building Code (2015) adopted by New York State. On this basis, it was determined that Seismic Site Class “D - Stiff Profile” is applicable to this project. Based upon the composition of the site soils, liquefaction should not occur in response to earthquake motions. This seismic site classification and liquefaction analyses is based, in part, upon the results of shear wave velocity testing completed in similar geologic conditions in the general project area.

C. Site Preparation and Earthwork

If possible, site preparation should be planned during a seasonal dry period to minimize the adverse impacts of shallow groundwater and soft/wet subgrade conditions on construction. We caution that the subgrade soils will rapidly soften and loose strength when subjected to ordinary construction equipment traffic, particularly when the soils are wet. The contractor should make efforts to maintain the subgrades in a dry and stable condition. These efforts may include the installation of drainage

trenches and shaping of subgrade surfaces to promote runoff away from the construction areas, restricting construction equipment traffic from traveling across the subgrade surface when it is wet, and installing temporary haul and construction roads as appropriate for the specific weather conditions and equipment he intends to employ at the site.

Prior to commencing work, perimeter swales and trenches should be installed to intercept and divert runoff and shallow groundwater away from the construction areas. Site preparation in the proposed building pad and pavement areas should begin with the clearing and stripping of topsoil and surficial organics. The site earthwork bidders should not rely solely on the topsoil and fill thicknesses measured at the discrete test boring locations completed for this investigation, but should perform their own explorations as needed to obtain a representative thickness of topsoil throughout the areas where stripping is required.

Subgrade surfaces should be shaped, crowned, and sloped to promote their drainage at all times and that of the granular structural fills which will overlie them. Prior to placing fills in areas where the subgrades are not wet, the building and pavement subgrades should be proof-rolled by completing at least three passes using a steel drum roller with a static weight of at least five tons. The roller should operate in the static mode unless specifically directed otherwise by a Geotechnical Engineer observing the work. Any subgrade soils that are or become soft and wet should be evaluated by the Geotechnical Engineer and where deemed necessary undercut and stabilized accordingly. The subgrade surface should be sealed with a smooth drum roller at the end of each day and upon final grading.

In low lying areas of the site where the subgrades may be soft and wet, proof-compaction should not be performed. Rather the area should be observed by a Geotechnical Engineer to determine the methods to stabilize the surfaces. It should be assumed that the initial lifts of fill in these areas must be placed ahead of the hauling and spreading equipment. It may also be necessary to place an initial 24-inch thick lift of clean crushed stone over a geotextile fabric to form a relatively stable base for construction. The thickness of the stone base and its extent should be determined by a Geotechnical Engineer based upon the planned final grading and the subgrade conditions at the time of construction.

Suitable on-site soils or Imported Structural Fill should be used as fill and backfill in building and pavement areas. The Suitable on-site materials should consist of well graded sand or sand and gravel approved by the Geotechnical Engineer at the time of construction. Imported Structural Fill should consist of well graded sand and gravel or crusher-run stone conforming to the following limits of gradation. The fill should not

contain recycled asphalt, bricks, glass, pyritic shale or recycled concrete, unless with the owner's specific consent. On-site soils composed of silt and/or clay should be reused in landscaped areas only or wasted off-site.

STRUCTURAL FILL

Sieve Size	Percent Finer
3"	100
1/4"	30 to 75
No. 40	5 to 40
No. 200	0 to 10

The Structural Fill should be placed in uniform loose layers no more than about one-foot thick where heavy vibratory compaction equipment is used. Smaller lifts should be used where hand operated equipment is required for compaction. Each lift should be compacted to not less than 95 percent of the maximum dry density for the soil which is established by the Modified Proctor Compaction Test, ASTM D1557. In landscape areas, the compaction may be reduced to 90 percent maximum dry density.

D. Foundations

Spread Foundations

Conventional shallow spread foundations may be seated on the undisturbed native soils with a crushed stone base or on Structural Fill placed to increase site grades. For planning purposes, it should be assumed that a minimum 24-inch thick base of crushed stone must be placed beneath all foundations for the apartment building and parking garages where the foundations are seated at or below the existing ground surface. The base course thickness may be reduced to 6-inches where underlain by at least 24-inches of Structural Fill. In the office building area, a minimum 6-inch thick base of crushed stone should be planned beneath the foundations. The required thickness of the stone base should be evaluated by a Geotechnical Engineer at the time of construction based upon the actual conditions encountered.

Prior to placing the stone base, the surface should be trimmed to grade using a backhoe equipped with a smooth edged bucket to limit disturbance of the soils. Upon approval of the subgrade by a Geotechnical Engineer, a geotextile stabilization fabric (Mirafi 500X or equivalent) should be placed followed by the crushed stone base composed of ASTM C33 Blend 57 aggregate. The stone should be chinked together using a reversible plate of mechanical tamper. All final bearing grades should be firm, stable, and free of loose soil, mud, water, and frost.

The foundations may be proportioned for a maximum net allowable bearing pressure equal to 3,000 pounds per square foot (psf) for the office building located as currently

planned. The foundations for the apartment building and garages may be proportioned for a maximum net allowable bearing pressure equal to 2,000 psf when positioned as currently planned. Continuous wall and isolated column foundations should have minimum widths of 24 and 36 inches, respectively, even if this results in a bearing pressure which is less than the maximum allowable. Exterior foundations should bear at least four feet beneath final adjacent exterior grades to afford frost penetration protection. Interior foundations should also be seated at the four feet depth in accord with town of Colonie requirements.

Assuming standard care is used in preparing the bearing grades, we estimate that total foundation settlement should be less than 1.0 inch for the office building and parking garages, and 1.5 inches for the apartment building. The settlements should occur within a few hours to days after construction is completed and each load increment is applied.

The installation of a perimeter foundation drain is recommended for all buildings. The drain may consist of a nominal 4-inch diameter perforated PVC or slotted HDPE pipe embedded at the base of a minimum 12-inch wide column of clean crushed stone (Blend 57 aggregate). The stone should be wrapped in a filter fabric such as Mirafi 140N or equivalent.

Pile Foundations

As previously noted, steel H-pile foundations driven to refusal on bedrock may be considered as an option for the apartment building. The piles may be designed for an allowable axial compressive load equal to the pile cross-sectional area times 10.5 kips per square inch. For example, HP10x42 section piles with area of 12.4 square inches would have an allowable axial capacity of 130 kips (12.4 in^2 x 10.5 ksi).

The piles should be spaced no closer than three feet, with a minimum of three piles in any group supporting columns not restrained laterally by grade beams or haunched slabs. Piles which are laterally restrained may be installed in single or double pile groups. No pile group reduction factor for vertical loads is necessary.

The H-Piles should be fitted with a cast steel Pruyn Point Shoe HP75500 as manufactured by Associated Pile and Fitting Co., Inc. to protect the piles as they are driven into the shale bedrock.

The piles should be driven to refusal using a hammer with a minimum energy rating of 19,000 foot-pounds. For planning purposes, it can be assumed that refusal is achieved after the pile tip reaches the expected bedrock depth and at least 20 blows

per inch are required to drive the pile two (2) consecutive inches. The final driving criteria should be confirmed and refined based on dynamic load testing and analysis.

A wave equation analysis should be performed to verify that the hammer, cushion, and pile section actually employed achieves the design capacity without over-stressing the pile. Dynamic load testing should be conducted on at least three piles at locations spaced around the site and approved by the Geotechnical Engineer. Results of the wave equation analysis and load testing can be used to refine the pile driving criteria.

Settlement of the pile top should consist of elastic shortening of the pile under the design load and penetration of the pile into the bearing surface. The total movement of the pile top should be less than one-half inch.

E. Below Grade Walls

Depending upon the site grading, it appears that the west side of the proposed office building may retain earth. No below grade spaces are planned for the apartment building, and we recommend against such given the groundwater and loose/soft subgrade conditions in that area. The design of walls which do retain earth may proceed using the following unfactored parameters. The design parameters assume that the backfill consists of imported Structural Fill.

- Soils Angle of Internal Friction (φf) = 30 degrees
- Coefficient of At-Rest Earth Pressure = 0.50
- Coefficient of Active Earth Pressure = 0.33
- Coefficient of Passive Earth Pressure = 3.00
- Total Unit Weight of Compacted Soil = 120 pcf
- Coefficient of Sliding Friction Soil ($\tan\varphi f$) = 0.60 (assumes crushed stone base)

Foundation drains and/or weep holes should be installed as required to prevent surface infiltration and groundwater from becoming trapped in the wall backfill soils.

F. Floor Slabs

Floor slabs for the office building should be constructed upon a minimum 8-inch thick subbase of Structural Fill and 4-inch thick base of crushed stone (ASTM Blend 57 material). The apartment building and garage floor subbase thicknesses should be increased to at least 24-inches and, where considered to be necessary, the subbase material should be changed to crushed stone. Dependent upon the season the work is performed, it may be prudent to place a layer of woven stabilization fabric beneath the subbase to assist in supporting construction traffic. Even with the fabric, we

caution that the subgrades may not support repeated heavy construction traffic or lulls without suffering rutting and weaving that may be especially severe during wet seasons. If the grades are to be repeatedly traversed by these types of equipment, they should be reinforced as necessary to support them. Areas which become disturbed should be excavated and stabilized accordingly.

A modulus of subgrade reaction equal to 150 pounds per cubic inch (pci) at the top of the stone base layer may be used in the slab design. A vapor retarder, such as Stego Wrap 15 mil, should be placed beneath the slab in accordance with the latest revision of the ACI Guide for Concrete Floor and Slab Construction.

G. Pavements

All base course layers and their subgrades should be drained through sloping and crowning of subgrades to the peripheral swales and french drains recommended previously, or to underdrains where appropriate to the final grading plan to assure satisfactory performance. Peripheral and intermediate under drains should also be incorporated, as well as gravel backfilled utilities with sloped subgrades, to assure that drained base courses are provided. All base course materials should be compacted to 95 percent of the material's maximum dry density as established through the Modified Proctor Test, ASTM D-1557.

Two flexible pavement sections are provided for consideration at the site dependent upon anticipated traffic types. A Heavy Section should be used for entrance drives and areas subject to repeated truck traffic, and a Light Section employed for areas subject to automobile parking and occasional delivery and or service trucks. We should be provided the opportunity to review site grading plans and modify the recommended pavement sections accordingly. On the east side of the site particularly, the addition of a Structural Fill or Crushed Stone subbase may be warranted based upon the final grading.

MATERIAL SECTION	THICKNESS		NYSDOT SPECIFICATION
	Light Section	Heavy Section	
Wearing Course	1"	1½"	403 Type 6
Binder Course	2"	3½ "	403 Type 3
Base Course	12"	12"	304 Type 2
Synthetic Fabric	Yes	Yes	Mirafi 500X

Rigid Portland concrete pavement may be designed to bear upon twelve inches of NYSDOT Type 2 material and the synthetic fabric recommended above, and designed in accord with the recommended procedures of the American Concrete Institute or Portland Cement Association using a composite Modulus of subgrade reaction equal to 150 pounds per cubic inch when constructed upon the subgrades prepared as recommended previously.

It should be understood that sidewalks and pavements constructed upon the site's soils will heave as frost seasonally penetrates the subgrades. The magnitude of the seasonal heave will vary with many factors, and result in differential movements. As the frost leaves the ground, the sidewalks and pavements will settle back, but not entirely in all areas, and this may accentuate the differential movements across the pavement areas. Where curbs, walks, and storm drains meet these pavements, these differential heave and settlements may result in undesirable movements, and create trip hazards. To limit the magnitude of heave and the creation of these uneven joints to generally tolerable magnitudes for most winters, a 16-inch thick crushed stone base course, composed of Blend 57 aggregate, may be placed beneath the sensitive sidewalk, drive, etc. areas. The stone layer must have an underdrain placed within it.

It should also be understood that the recommended pavement sections were not designed to support heavy construction equipment loads which would require an augmented section. The contractor should construct temporary haul and construction roadways and routes about the site as appropriate for the specific weather conditions and construction equipment he intends to employ at the site, and the overburden soil conditions encountered in the specific areas. Construction period traffic should not be routed across the recommended pavement sections unless augmented.

Finally, it should be understood that all pavements require routine maintenance and occasional repairs. Failure to provide maintenance and complete the required repairs in a timely manner will result in a shortened pavement service life.

H. Plan Review and Construction Monitoring

Dente Group should be retained to review plans and specifications related to foundations and earthwork prior to their release for bidding to confirm that the recommendations contained herein were properly interpreted and applied.

Dente Group should also be retained to monitor earthwork and bearing grade preparations for foundations, floor slabs, and pavements. It should be understood that the actual subsurface conditions that exist will only be known when the site is excavated. Our presence during the earthwork and foundation construction phases will allow validation of the subsurface conditions assumed to exist for this study and

the design recommended in this report. We believe this construction sequence observation and testing should be provided by the Geotechnical Engineer of record as a consultant to the Owner, Architect or Construction Manager. We do not believe these services should be provided through the general or earthwork contractor.

V. CLOSURE

This report was prepared for specific application to the project site and the construction planned using methods and practices common to Geotechnical Engineering in the area and at the time of its preparation. No other warranty, either expressed or implied, is made.

We appreciate the opportunity to be of service. Should questions arise or if we may be of any other service, please contact us at your convenience.

Submitted by;

Edward Gravelle

7/2/18

Edward C. Gravelle, P.E.
Senior Engineer

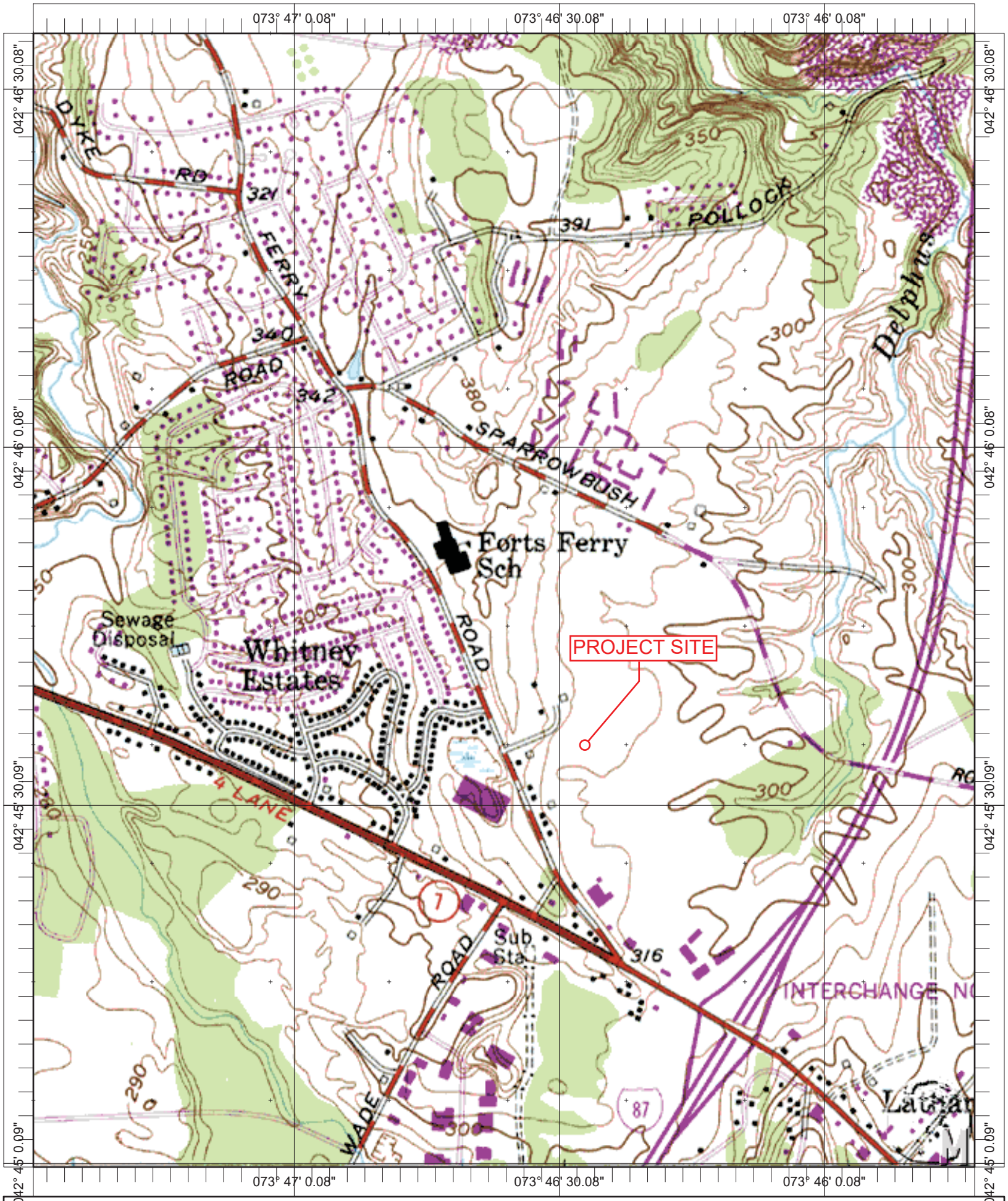
7/2/18

Fred A. Dente, P.E.
Principal / Office Manager

APPENDIX A

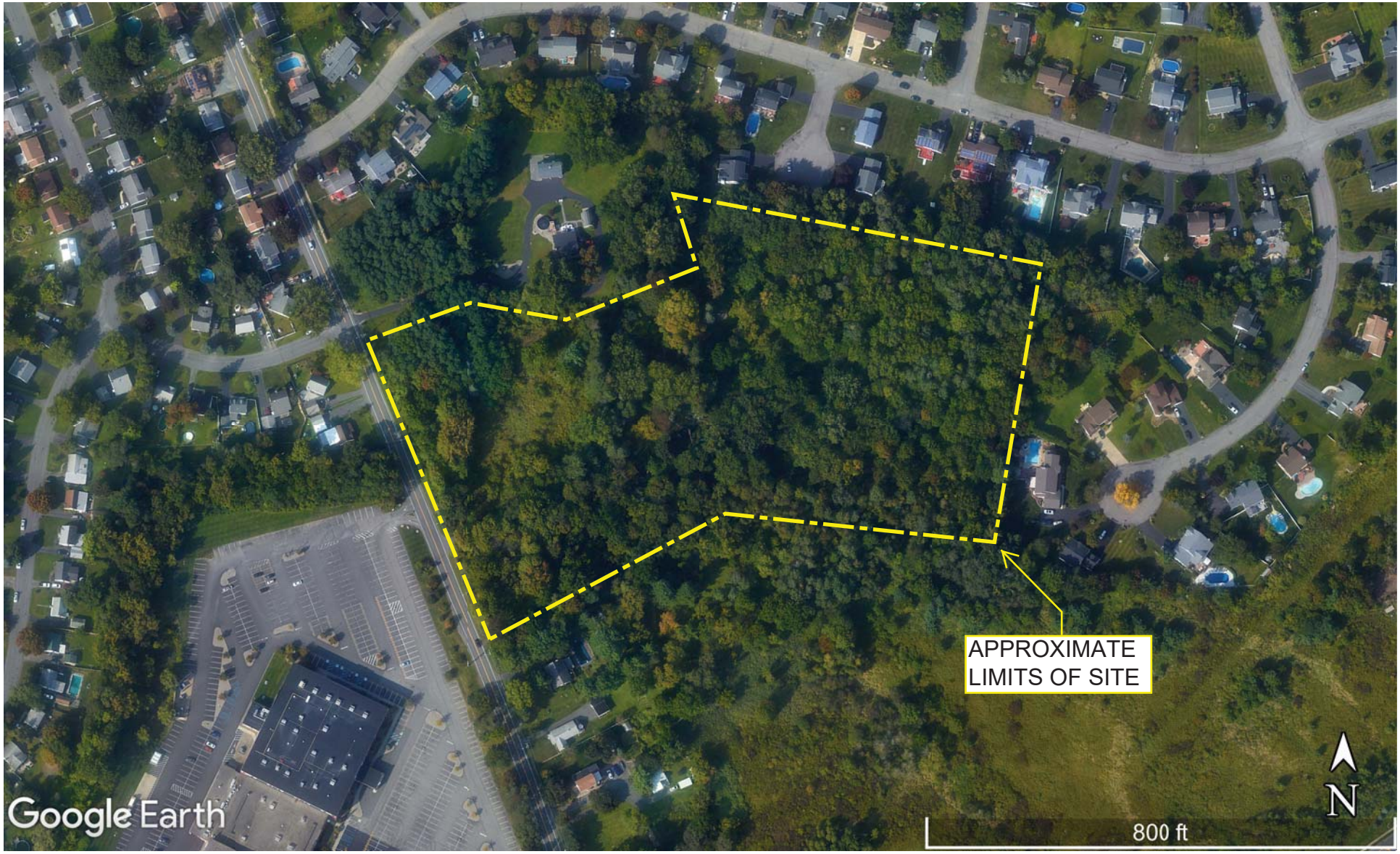
USGS TOPOGRAPHIC MAP AND AERIAL PHOTOGRAPH

The Summit at Forts Ferry
Colonie, New York



Name: NISKAYUNA
Date: 6/29/118
Scale: 1 inch equals 1000 feet

Location: 042° 45' 47.3" N 073° 46' 36.4" W
Caption: SITE LOCATION MAP
THE SUMMIT AT FORTS FERRY
COLONIE, NEW YORK



THE SUMMIT AT FORTS FERRY
33 & 45 FORTS FERRY ROAD
COLONIE, NEW YORK

APPENDIX B

COUNTY SOIL SURVEY INFORMATION

The Summit at Forts Ferry
Colonie, New York

Soil Map—Albany County, New York
(SUMMIT AT FORTS FERRY)

Map Scale: 1:2,150 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 30 60 120 180

Feet
0 100 200 400 600

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Albany County, New York
Survey Area Data: Version 15, Oct 8, 2017

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

Date(s) aerial images were photographed: Jun 10, 2015—Mar 29, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
HuB	Hudson silt loam, 3 to 8 percent slopes	3.4	28.0%
RhA	Rhinebeck silty clay loam, 0 to 3 percent slopes	2.8	23.1%
RkB	Riverhead fine sandy loam, 3 to 8 percent slopes	2.7	22.3%
SuB	Sudbury fine sandy loam, 3 to 8 percent slopes	0.4	3.3%
Ud	Udipsamments, smoothed	0.4	3.5%
Uk	Udorthents, loamy-Urban land complex	0.6	4.7%
UnB	Unadilla silt loam, 3 to 8 percent slopes	1.8	15.1%
Totals for Area of Interest		**12.0**	**100.0%**

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Albany County, New York

HuB—Hudson silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9pg5
Elevation: 300 to 1,800 feet

Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Hudson and similar soils: 90 percent
Minor components: 10 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 11 inches: silt loam
H2 - 11 to 16 inches: silty clay loam
H3 - 16 to 31 inches: silty clay
H4 - 31 to 60 inches: clay

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

Rhinebeck

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

Madalin

Percent of map unit: 2 percent
Landform: Depressions

Hydric soil rating: Yes

Unnamed soils

Percent of map unit: 2 percent

Claverack

Percent of map unit: 1 percent
Hydric soil rating: No

RhA—Rhinebeck silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9phh
Elevation: 80 to 1,000 feet
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Rhinebeck and similar soils: 90 percent
Minor components: 10 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 7 inches: silty clay loam
H2 - 7 to 34 inches: silty clay
H3 - 34 to 64 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural 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 in profile: 15 percent
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Hydric soil rating: No

Minor Components

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

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

RkB—Riverhead fine sandy loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9phl
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: All areas are prime farmland

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

Description of Riverhead

Setting
Landform: Deltas, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits overlying stratified sand and gravel

Typical profile
H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 25 inches: fine sandy loam
H3 - 25 to 31 inches: loamy fine sand
H4 - 31 to 65 inches: gravelly fine sand

Properties and qualities
Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural 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 storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Colonie

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

Sudbury

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

Unadilla

Percent of map unit: 3 percent
Hydric soil rating: No

Scio

Percent of map unit: 2 percent
Hydric soil rating: No

SuB—Sudbury fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9pht
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Sudbury

Setting

Landform: Outwash plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex

Parent material: Sandy and gravelly glaciofluvial deposits

Typical profile

H1 - 0 to 11 inches: fine sandy loam
H2 - 11 to 20 inches: fine sandy loam
H3 - 20 to 29 inches: loamy sand
H4 - 29 to 48 inches: loamy sand
H5 - 48 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Scio

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

Colonie

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

Elmridge

Percent of map unit: 2 percent
Hydric soil rating: No

Shaker

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: No

Raynham

Percent of map unit: 1 percent
Hydric soil rating: Yes

Ud—Udipsamments, smoothed

Map Unit Setting

National map unit symbol: 9phy
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Udipsamments, smoothed, and similar soils: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udipsamments, Smoothed

Typical profile
H1 - 0 to 70 inches: coarse sand

Properties and qualities
Slope: 0 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very high (19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.6 inches)

Minor Components

Urban land
Percent of map unit: 10 percent
Hydric soil rating: Unranked

Unnamed soils
Percent of map unit: 10 percent

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

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

Uk—Udorthents, loamy-Urban land complex

Map Unit Setting
National map unit symbol: 9pj3
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, loamy, and similar soils: 40 percent
Urban land: 30 percent

Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Loamy

Typical profile
H1 - 0 to 4 inches: loam
H2 - 4 to 70 inches: channery loam

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 5.95 in/hr)
Depth to water table: About 36 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 5.5 inches)

Minor Components

Valois
Percent of map unit: 10 percent
Hydric soil rating: No

Nunda
Percent of map unit: 10 percent
Hydric soil rating: No

Riverhead
Percent of map unit: 9 percent
Hydric soil rating: No

Ilion
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

UnB—Unadilla silt loam, 3 to 8 percent slopes

Map Unit Setting
National map unit symbol: 9pj5
Elevation: 600 to 1,800 feet
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 100 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition
Unadilla and similar soils: 85 percent
Minor components: 15 percent

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

Description of Unadilla

Setting

Landform: Lake plains
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Glaciolacustrine deposits, eolian deposits, or old alluvium, comprised mainly of silt and very fine sand

Typical profile

H1 - 0 to 9 inches: silt loam
H2 - 9 to 64 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Scio

Percent of map unit: 7 percent
Hydric soil rating: No

Unnamed soils

Percent of map unit: 5 percent

Raynham

Percent of map unit: 3 percent
Hydric soil rating: Yes

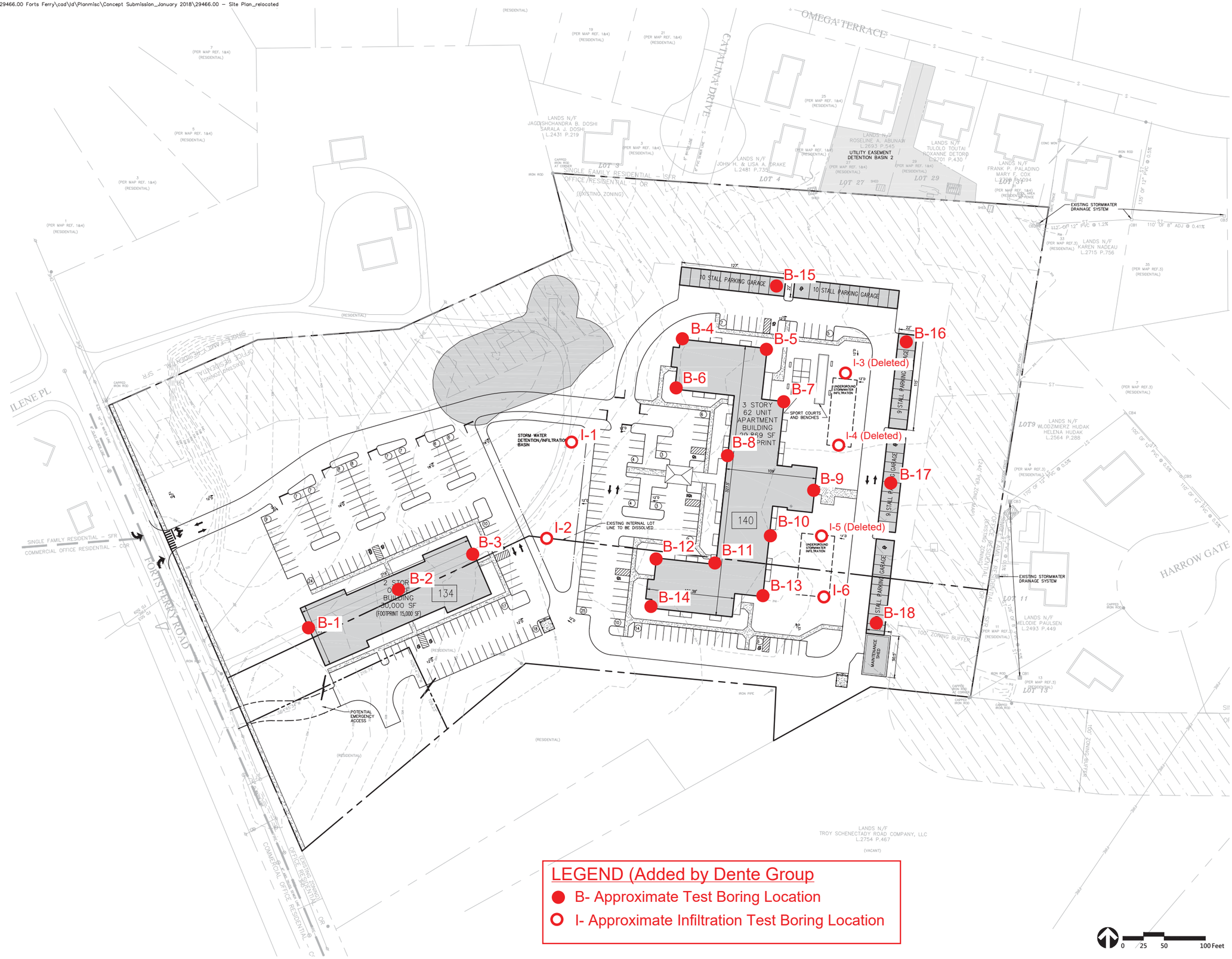
Data Source Information

Soil Survey Area: Albany County, New York
Survey Area Data: Version 15, Oct 8, 2017

APPENDIX C

SUBSURFACE INVESTIGATION PLAN

The Summit at Forts Ferry
Colonie, New York



LEGEND (Added by Dente Group

- B- Approximate Test Boring Location
- I- Approximate Infiltration Test Boring Location

0 25 50 100 Feet

vhb.com
vhb
Engineering, Surveying & Landscape Architecture, PC
100 Great Oaks Boulevard
Suite 118
Albany, NY 12203
518.389.3600

The Summit at Forts Ferry

33 & 45 Forts Ferry Road
Colonie, New York

No.	Revision	Date	Appvd

Designed by | Checked by

Issued for | Date

March 30, 2018

Not Approved for Construction

Drawing Title
Sketch Plan

Drawing Number
C-2

Sheet 2 of 1

Project Number
29466.00

APPENDIX D

SUBSURFACE LOGS AND KEY

The Summit at Forts Ferry
Colonie, New York

INTERPRETATION OF SUBSURFACE LOGS

The Subsurface Logs present observations and the results of tests performed in the field by the Driller, Technicians, Geologists and Geotechnical Engineers as noted. Soil/Rock Classifications are made visually, unless otherwise noted, on a portion of the materials recovered through the sampling process and may not necessarily be representative of the materials between sampling intervals or locations.

The following defines some of the terms utilized in the preparation of the Subsurface Logs.

SOIL CLASSIFICATIONS

Soil Classifications are visual descriptions on the basis of the Unified Soil Classification ASTM D-2487 and USBR, 1973 with additional comments by weight of constituents by BUHRMASTER. The soil density or consistency is based on the penetration resistance determined by ASTM METHOD D1586. Soil Moisture of the recovered materials is described as DRY, MOIST, WET or SATURATED.

SIZE DESCRIPTION		RELATIVE DENSITY/CONSISTENCY (basis ASTM D1586)			
SOIL TYPE	PARTICLE SIZE	GRANULAR SOIL		COHESIVE SOIL	
BOULDER	> 12	DENSITY	BLOWS/FT.	CONSISTENCY	BLOWS/FT.
COBBLE	3" - 12"	LOOSE	< 10	VERY SOFT	< 3
GRAVEL-COARSE	3" - 3/4"	FIRM	11 - 30	SOFT	4 - 5
GRAVEL - FINE	3/4" - #4	COMPACT	31 - 50	MEDIUM	6 - 15
SAND - COARSE	#4 - #10	VERY COMPACT	50 +	STIFF	16 - 25
SAND - MEDIUM	#10 - #40			HARD	25 +
SAND - FINE	#40 - #200				
SILT/NONPLASTIC	< #200				
CLAY/PLASTIC	< #200				

SOIL STRUCTURE		RELATIVE PROPORTION OF SOIL TYPES	
STRUCTURE	DESCRIPTION	DESCRIPTION	% OF SAMPLE BY WEIGHT
LAYER	6" THICK OR GREATER	AND	35 - 50
SEAM	6" THICK OR LESS	SOME	20 - 35
PARTING	LESS THAN 1/4" THICK	LITTLE	10 - 20
VARVED	UNIFORM HORIZONTAL PARTINGS OR SEAMS	TRACE	LESS THAN 10

Note that the classification of soils or soil like materials is subject to the limitations imposed by the size of the sampler, the size of the sample and its degree of disturbance and moisture.

ROCK CLASSIFICATIONS

Rock Classifications are visual descriptions on the basis of the Driller's, Technician's, Geologist's or Geotechnical Engineer's observations of the coring activity and the recovered samples applying the following classifications.

CLASSIFICATION TERM	DESCRIPTION
VERY HARD	NOT SCRATCHED BY KNIFE
HARD	SCRATCHED WITH DIFFICULTY
MEDIUM HARD	SCRATCHED EASILY
SOFT	SCRATCHED WITH FINGERNAIL
VERY WEATHERED	DISINTEGRATED WITH NUMEROUS SOIL SEAM
WEATHERED	SLIGHT DISINTEGRATION, STAINING, NO SEAMS
SOUND	NO EVIDENCE OF ABOVE
MASSIVE	ROCK LAYER GREATER THAN 36" THICK
THICK BEDDED	ROCK LAYER 12" - 36"
BEDDED	ROCK LAYER 4" - 12"
THIN BEDDED	ROCK LAYER 1" - 4"
LAMINATED	ROCK LAYER LESS THAN 1"
FRACTURES	NATURAL BREAKS AT SOME ANGLE TO BEDS

Core sample recovery is expressed as percent recovered of total sampled. The ROCK QUALITY DESIGNATION (RQD) is the total length of core sample pieces exceeding 4" length divided by the total core sample length for N size cored.

GENERAL

- Soil and Rock classifications are made visually on samples recovered. The presence of Gravel, Cobbles and Boulders will influence sample recovery classification density/consistency determination.
- Groundwater, if encountered, was measured and its depth recorded at the time and under the conditions as noted.
- Topsoil or pavements, if present, were measured and recorded at the time and under the conditions as noted.
- Stratification Lines are approximate boundaries between soil types. These transitions may be gradual or distinct and are approximated.

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-1**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/8/18	FINISH: 5/8/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	3	4				± 6” Shale over ± 2” Cinders over Light Brown
				4	4	8	SILT, Moist
	2	4	3				Grades Little Fine Sand
				3	5	6	
							(MOIST, LOOSE)
5'	3	3	3				Brown Fine to Medium SAND, Little Gravel,
				3	2	6	trace silt, Moist
							(MOIST, LOOSE)
10'	4	3	4				Brown Stratified Seams SILT, Fine SAND, and
				6	7	10	CLAY, Moist
15'	5	3	5				Similar, Wet
				6	5	11	**(MOIST TO WET, FIRM)**
							Boring Ended at 17.0’
							Groundwater in augers at 13.0’ below grade 30
20'							minutes after completion of drilling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-2.1**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/8/18	FINISH: 5/8/18

LOCATION: Colonie, New York	**METHODS:** 4-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	2				± 6" TOPSOIL over Brown Fine SAND and
				2	3	4	SILT, Moist
	2	4	3				Similar with occasional partings Clay
				4	5	7	
							(MOIST, LOOSE)
5'	3	6	7				Brown Fine to Coarse SAND, Some Gravel,
				10		17	Little Silt, Moist
10'	4	7	10				Similar
				9		19	
15'	5	6	7				Grades Dark Grayish Brown, trace silt, Wet
				7		14	
20'	6	2	9				Similar
				9		18	
25'							**(MOIST TO WET, FIRM)**
	7	9	11				Gray SAND and GRAVEL, trace silt, Wet
				14		25	

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-2.2**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/8/18	FINISH: 5/8/18

LOCATION: Colonie, New York	**METHODS:** 4-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	8	7	11				Gray SAND and GRAVEL, trace silt, Wet
				12		23	
35'	9	3	4				Similar with Layer Gray SILT
				6		10	
40'	10	5	10				**(WET, FIRM TO LOOSE)**
				19		29	Gray SILT, Some Sand and Gravel
							(MOIST, FIRM)
	11	50/.3'				REF	Gray SHALE Fragments **(MOIST)**
45'							Boring Ended at 43.3' with Spoon Refusal
							Groundwater in augers at 13.7' below grade after Sample #5 was obtained.
50'							
55'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-3**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/9/18	FINISH: 5/9/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	9	10				± 18” Shale over Brown Fine to Coarse SAND,
				16	13	26	Little Gravel and Silt **(MOIST, FIRM)**
	2	11	5				Light Brown SILT, Moist
				6	5	11	
5'							
	3	3	3				Grades Light Brown SILT and CLAY, Moist
				6	6	9	
10'							**(MOIST, FIRM / MEDIUM)**
	4	5	4				Dark Grayish Brown Fine to Coarse SAND,
				4	5	8	trace silt, Wet
15'							
	5	2	5				Grades GRAVEL, Some Sand with Silt seams
				6	5	11	**(WET, LOSE TO FIRM)**
							Boring Ended at 17.0’
							Groundwater in augers at 12.0’ below grade at
20'							completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-4**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/10/18	FINISH: 5/10/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	1	1				Light Brown Mottled SILT, Moist
				2	4	3	
5'	2	1	2				Grades Brown SILT with seam Fine SAND at
				2	1	4	6' depth, Wet
10'	3	WH	WH				Grades Gray SILT with occasional partings
				WH	WH	WH	Clay, Wet
15'							**(MOIST TO WET, LOOSE)**
	4	6	50/.4'			REF	Gray SHALE Fragments **(WET)**
							Boring Ended at 15.9' with Spoon Refusal
20'							No measurable groundwater in augers at completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-5**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/10/18	FINISH: 5/10/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	2	1				Brown Mottled SILT, Little Clay, Moist
				2	2	3	
5'	2	1/12”	-				Grades Brown/Gray Mottled SILT, Wet
				1/12”	-	1	
10'	3	1	1/12”				**(MOIST TO WET, SOFT / LOOSE)** Brown Fine SAND, Little Silt, Wet
				-	1	1	
15'	4	1	3				**(WET, LOOSE)**
				50/.1’		REF	Gray SHALE Fragments **(MOIST)**
20'							Boring Ended at 16.1’ with Spoon Refusal Groundwater in augers at 3.7’ below grade 30 minutes after completion of drilling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-6**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/9/18	FINISH: 5/9/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				Light Brown/Gray Mottled SILT, Little Clay
				2	2	2	
							(MOIST TO WET, VERY SOFT)
5'	2	WH	1				Brown Fine SAND, Little Silt, Wet
				2	2	3	
							(WET, LOOSE)
10'	3	1	1				Gray SILT, Wet
				2	4	3	
15'	4	14	15				Similar with layer GRAVEL
				17	4	32	**(WET, LOOSE / COMPACT)**
							Boring Ended at 17.0’
							Groundwater in augers at 3.8’ below grade 30
20'							minutes after completion of drilling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-7**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/10/18	FINISH: 5/10/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	1				Light Gray/Brown Mottled SILT and CLAY
				2	2	3	
							(MOIST TO WET, SOFT)
5'	2	12	14				Gray SILT, Wet
				16	16	30	
10'	3	1	2				Grades Some Fine Sand
				1	1	3	
15'	4	5	37				Similar with seam GRAVEL
				8	5	45	**(WET, COMPACT TO LOOSE)**
							Boring Ended at 17.0'
							No measurable groundwater in augers at
20'							completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-8**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/14/18	FINISH: 5/14/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 8" TOPSOIL over Brown/Gray Mottled SILT
				1	2	1	and CLAY
							(MOIST TO WET, VERY SOFT)
5'	2	3	4				Gray SILT Becomes Gray Fine SAND, Some
				3	2	7	Silt, Wet
10'	3	WR	WH				Similar
				1	5	1	
15'	4	-	50/.0'			REF	**(WET, LOOSE)**
							Boring Ended at 14.8' with Auger and
							Sample Spoon Refusal
							No measurable groundwater in augers at
20'							completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-9**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/15/18	FINISH: 5/15/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 8" TOPSOIL over Gray/Brown Mottled SILT and CLAY **(MOIST, VERY SOFT)**
				1	2	1	
5'	2	8	10				Brown to Gray SILT **(WET)**
				15	16	25	Gray GRAVEL, Some Sand, Little Silt **(WET, FIRM)**
	3	-	17				Gray SILT, SAND and GRAVEL, Moist
				25	23	48	
10'					18		
15'	4	18	20				Grades Some to Little Sand and Gravel **(MOIST, COMPACT)**
				25	37	45	
							Boring Ended at 17.0'
							No measurable groundwater in augers at completion of drilling and sampling.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-10**

PROJECT: Summit at Forts Ferry	**DATE**	**START:** 5/14/18	**FINISH:** 5/14/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 8" TOPSOIL over Light Brown/Gray Mottled
				2	2	2	SILT, Some Clay
							(MOIST TO WET, VERY SOFT)
5'	2	3	4				Brown Fine SAND, Little Silt, Wet
				5	1	9	
							(WET, LOOSE)
10'	3	6	12				Gray SAND and GRAVEL, Little Silt
				4	3	16	**(WET, FIRM)**
	4	-	50/.1'			REF	Gray SHALE Fragments at 12.4' **(WET)**
							Boring Ended at 12.5' with Spoon Refusal
							Auger Refusal at 12.4'
15'							
							Groundwater in open borehole at 1.7' below
							grade after removing augers.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-11**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/14/18	FINISH: 5/14/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 8" TOPSOIL over Gray/Brown Mottled SILT and CLAY
				1	2	1	
							(MOIST TO WET, VERY SOFT)
5'	2	3	4				Brown Fine SAND, Little Silt, Wet
				5	3	9	
							(WET, LOOSE)
10'	3	6	12				Dark Gray Fine to Medium SAND with seam GRAVEL and SAND
				4	3	16	
							(WET, FIRM)
15'							Gray SHALE Fragments **(MOIST)**
	4	50/.1'				REF	Boring Ended at 15.1' with Spoon Refusal
							No measurable groundwater in augers at completion of drilling and sampling.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-12**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/11/18	FINISH: 5/11/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	W				± 8" TOPSOIL over Brown Mottled SILT and
				1	2	1	CLAY
							(MOIST TO WET, VERY SOFT)
5'	2	3	2				Gray SILT with thin seams Clay
				1	1	3	
							(WET, LOOSE)
10'	3	WH	WH				Gray Fine SAND, Some Silt
				1	1	1	
							(WET, LOOSE)
15'	4	25	20				Gray SILT, Some Sand and Gravel, Little Clay
				23	26	43	**(MOIST, COMPACT)**
							Boring Ended at 17.0'
							No measurable groundwater in augers at
20'							completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-13**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/11/18	FINISH: 5/11/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	3	1				± 2” TOPSOIL over Light Brown SILT, Little Sand and Gravel
				1	3	2	
							(MOIST TO WET)
5'	2	6	7				Gray Fine SAND and SILT
				7	6	14	
							(WET, FIRM)
10'	3	WH	WH				Gray SILT with seams Clay
				WH	WH	WH	
							(WET, LOOSE / VERY SOFT)
15'	4	6	38				Gray SILT, Some Sand and Gravel **(WET)**
				48	50/.1’	86	Gray SHALE Fragments **(WET)**
							Boring Ended at 16.6’ with Spoon Refusal
							Groundwater in augers at 1.4’ below grade 30 minutes after completion of drilling.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-14**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/11/18	FINISH: 5/11/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	1				± 6" TOPSOIL over Light Brown Mottled SILT,
				2	2	3	Little Clay
							(MOIST TO WET, SOFT)
5'	2	3	5				Grades Brown SILT with partings Clay
				5	4	10	Brown Fine SAND, Little Silt
10'	3	1	1				Grades Gray
				3	6	4	
							(WET, LOOSE)
15'	4	50/.1'				REF	Gray SILT, SAND and GRAVEL **(MOIST)**
							Boring Ended at 14.1' with Spoon Refusal
							No groundwater measurement obtained.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-15**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/10/18	FINISH: 5/10/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				Light Brown Mottled SILT and CLAY
				1	3	1	
							(MOIST, VERY SOFT)
5'	2	4	6				Brown SILT, Little Fine Sand
				9	9	15	
							(MOIST TO WET, FIRM)
10'	3	12	10				Gray Fine SAND, Little Silt
				12	12	22	
							(WET, FIRM)
15'	4	7	9				Dark Gray Fine to Medium SAND, Becomes
				11	11	20	GRAVEL, Some Sand **(WET, FIRM)**
							Boring Ended at 17.0'
							No groundwater measurement obtained.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-16**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/15/18	FINISH: 5/15/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	1				± 7" TOPSOIL over Brown SILT, trace clay,
				2	3	3	Moist
5'	2	1	1				Grades Brown SILT with occasional partings
				2	2	3	Clay, Wet
10'	3	WH	3				Grades Gray
				7	13	10	
15'							**(MOIST TO WET, LOOSE TO FIRM)**
	4	22	40				Gray SILT, Some Sand and Gravel
				23	17	63	**(MOIST, VERY COMPACT)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-17**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/15/18	FINISH: 5/15/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 7" TOPSOIL over Brown Mottled SILT and
				2	3	2	CLAY
5'	2	3	4				**(MOIST TO WET, VERY SOFT TO MEDIUM)**
				7	9	11	Brown SILT
10'	3	10	14				Grades Gray
				7	5	21	
15'							**(WET, FIRM)**
	4	3	5				Gray SAND and GRAVEL, Little Silt
				5	3	10	**(WET, LOOSE)**
							Boring Ended at 17.0'
20'							No measurable groundwater in augers at completion of drilling and sampling.
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **B-18**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/9/18	FINISH: 5/9/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	1				± 6" TOPSOIL over Light Brown SILT, Little
				2	3	3	Clay
							(VERY MOIST, SOFT)
5'	2	3	6				Brown Varved SILT, CLAY, and Fine SAND
				8	11	14	
							(MOIST TO WET, MEDIUM / FIRM)
10'	3	WH	2				Brown and Gray Fine SAND and SILT
				1	2	3	
							(WET, LOOSE)
							Gray SILT, Little Sand and Gravel **(MOIST)**
15'	4	50/.4'				REF	Gray SANDSTONE Fragments **(MOIST)**
							Boring Ended at 15.4' with Spoon Refusal
							No measurable groundwater in auger at
							completion of drilling and sampling.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **I-1**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/14/18	FINISH: 5/14/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
5'	1	4	5				Brown/Gray Mottled SILT and CLAY **(MOIST)**
				6	3	11	Brown SILT
10'	2	WH	1				Similar with occasional partings Clay
				2	2	3	**(WET, LOOSE)**
	3	1	3				Gray Fine to Medium SAND, trace silt
				3	3	6	**(WET, LOOSE)**
15'							Boring Ended at 14.0’
							Groundwater in augers at 9.0’ below grade 15 minutes after completion of drilling.
20'							
25'							

DENTE GROUP, A TERRACON COMPANY

SUBSURFACE LOG **I-2**

PROJECT: Summit at Forts Ferry

DATE START: 5/14/18 FINISH: 5/14/18

LOCATION: Colonie, New York

METHODS: 2-1/4" I.D. Hollow Stem Augers with ASTM D1586 Sampling

CLIENT: VHB

JOB NUMBER: JB185036

SURFACE ELEVATION:

DRILL TYPE: CME 55 ATV Mounted Rig

CLASSIFICATION: E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 12" TOPSOIL over Gray/Brown Mottled SILT,
				1	2	1	trace clay, Moist to Wet
	2	WH	2				Similar, Wet
				1	3	3	
	3	WH	1				Grades Gray SILT, occasional partings Clay
5'				2	3	3	
	4	4	6				Similar
				7	6	13	**(MOIST TO WET, LOOSE TO FIRM)**
							Boring Ended at 8.0'
10'							
							Groundwater in augers at 1.3' below grade at completion of drilling and sampling.
15'							
20'							
25'							

DENTE GROUP, A TERRACON COMPANY	SUBSURFACE LOG **I-6**

PROJECT: Summit at Forts Ferry	**DATE**	START: 5/11/18	FINISH: 5/11/18

LOCATION: Colonie, New York	**METHODS:** 2-1/4" I.D. Hollow Stem Augers
CLIENT: VHB	with ASTM D1586 Sampling
JOB NUMBER: JB185036	**SURFACE ELEVATION:**
DRILL TYPE: CME 55 ATV Mounted Rig	**CLASSIFICATION:** E. Gravelle, PE

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	WH	WH				± 6" TOPSOIL over Brown SILT, Moist to Wet
				WH	1	WH	
	2	1	2				Grades Gray/Brown Mottled SILT, Wet
				1	2	3	**(MOIST TO WET, LOOSE)**
5'							Boring Ended at 4.0'
							Groundwater in augers at 1.4' below grade 45 minutes after completion of drilling.
10'							
15'							
20'							
25'							