Geotechnical Engineering Report

Hospitality House
271 Central Avenue
Albany, New York
June 29, 2021
Terracon Project No. JB215093

Prepared for:
Architecture +
Troy, New York

Prepared by:
Terracon Consultants - NY, Inc.
Albany, New York

June 29, 2021

Architecture +
297 River Street
Troy, New York 12180

Attn: Mr. Felix Lomonaco
p: (518) 258-5353
e: lomonacof@aplususa.com

Re: Geotechnical Engineering Report
Proposed Renovation and Expansion
Hospitality House
271 Central Avenue
Albany, New York
Terracon Project No. JB215093

Dear Mr. Lomonaco:

We have completed the Geotechnical Engineering services for the referenced project. This study was performed in general accordance with Terracon proposal no. PJB205093 as authorized by Architecture + on April 27, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us at your convenience.

Sincerely,
Terracon Consultants-NY, Inc.

John S. Hutchison, P.E.
Senior Engineer

Joseph Robichaud, Jr., P.E.
Sr. Associate / Office Manager

REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents

Geotechnical Engineering Report

Hospitality House
271 Central Avenue
Albany, New York

Terracon Project No. JB215093

June 29, 2021

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed addition to the existing Hospitality House in Albany, New York. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Lateral earth pressures
- Temporary excavation support
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per NYSBC
- Frost considerations

The geotechnical engineering scope of services for this project included the advancement of two test borings to depths ranging from 22.0 to 42.0 feet below existing site grades, visual classification and limited laboratory testing of recovered soil samples, and preparation of this summary report.

Maps indicating the site and test boring locations are included as the attached **Site Location** and **Exploration Plan**, respectively.

SITE CONDITIONS

Existing conditions at the site are summarized in the following table:

Item	Description
Parcel Information	The project is located at 271 Central Avenue, at the northeast corner of the intersection of Central Avenue and North Lake Avenue, in the City of Albany, New York. For the sake of clarity in this report, Central Ave. is assumed oriented east-west. Approximate geographic coordinates: 42.6639 N, -73.7706 W.

Item	Description
Existing Improvements	Hospitality House, which consists of a three-story masonry clad building with a basement level, along with associated paved/landscaped areas and a temporary outbuilding.
Current Ground Cover	Predominantly asphalt pavement, some landscaping around the building and parking area perimeters.
Existing Topography	Topographic mapping provided for our use indicates the site is relatively flat/level, generally between elevation 230 and 233 feet.
Geology	Soils in the area are mapped as glaciolacustrine silt and clay on the Surficial Geologic Map of New York.

Circa 1989 record drawings furnished for our use indicate the basement floor of the existing building is approximately 5'-3" below exterior grade, while an elevator pit extends 9'-3" below grade and its sump extends some two feet below that (or about 11'-3" below grade). First floor level of the existing building is about three to four feet above surrounding site grades.

Available historical aerial photography suggests the site configuration has been largely consistent since at least 1952, with the exception of the temporary outbuilding located at the rear of the existing building.

PROJECT DESCRIPTION

Our understanding of the project is summarized as follows:

Item	Description
Information Provided	■ "Topographic site plan, Map No. 200127" by Hershberg & Hershberg, dated 6/1/2020 ■ Circa 1989 record drawings by Grennon Architects ■ Telephone and email correspondence with Architecture +
General Description	Project entails construction of an addition to the rear of the existing Hospitality House building.
Proposed Structure	Plans call for a four-story structure with basement level, to occupy nearly the entirety of the existing parking lot area.
Building Construction	Not provided.
Maximum Loads	No loading information provided – we assume the following: ■ Maximum column loads: 250 kips ■ Maximum wall loads: 8 kips per lineal foot (klf) ■ Maximum slab loads: 150 pounds per square foot (psf)
Finished Floor Elevation	Proposed first floor and basement levels will essentially match those of existing building, as we understand it.

Item	Description
Grading/Slopes	No proposed grading plan provided. We assume only minor cuts and fills, no more than about two feet, will be required for construction.
Below-Grade Structures	None, other than the basement level of the proposed addition.
Free-Standing Retaining Walls	Permanent site retaining walls not anticipated; however, temporary excavation support is likely required to facilitate construction.
Pavements	Not anticipated.

If any of the above information is incorrect, please let us know so we can review the conclusions and recommendations provided in this report for applicability to the actual design and update the report as appropriate.

As the design of the project progresses and site grading plans and building loads are fully developed, we should be retained to assess this site-specific information relative to the recommendations contained herein.

SUBSURFACE CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical analysis and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual subsurface logs. The individual logs can be found in the **Exploration Results** and the GeoModel in the **Figures** sections of this report.

Subsurface Profile

The following model layers were identified within the subsurface profile. For a more detailed view of the model layers with depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Sandy Silt**	Brown sandy silt w/ little clay, possible fill or reworked
2	**Brown Clay**	Brown silt and clay, relatively stiff
3	**Gray Clay**	Gray silt and clay, relatively soft

Surface Materials

The test boring first penetrated approximately 4 inches of asphalt pavement with underlying aggregate base at the ground surface. Below this, sandy silt with lesser amounts of clay was encountered, extending to depths of about 5 to 7 feet below existing grade. While no obvious

indications of foreign matter were noted therein, these materials may nonetheless represent previously placed fills or reworked native soils.

Native Soils

The sandy silt was underlain by native silt and clay. These cohesive soils graded from brown to gray at a depth of about 14 feet at the borehole locations, and prevailed through the remainder of the depths explored, 42.0 feet. Based on the SPT N-values obtained during our drilling procedure, the upper brown silt/clay was medium-stiff to very stiff, while the underlying gray silt/clay was very soft to soft.

Our experience in the project area indicates the silt and clay soils have been modestly preconsolidated, i.e. they have been loaded to stress intensities in excess of those that exist under the current overburden and have consolidated under these higher loads. The preconsolidation effect is believed to be the result of a combination of stresses induced through desiccation, or drying, caused by the regional lowering of the water table during the geologic past and by loading from overburden soils which existed previously in the area but have since been eroded.

With increasing depth, the effects of these loading conditions diminish. We estimate the net preconsolidation pressure for the cohesive soils at this site range from about 2 tons per square foot (tsf) surficially to 0.25 tsf at their terminal depths.

Groundwater Conditions

While no measurable water was present in the boreholes as they were drilled and/or upon completion of sampling, time adequate for groundwater to enter and achieve a static level in the augers likely did not elapse prior to the measurements being taken. We expect that groundwater is present beginning at a depth of about 14 feet below the ground surface, where the silt and clay soils became gray, wet and soft (this correlating with a groundwater surface elevation in the range of roughly 217 to 219 feet).

Because the permeability of the sandy silt, and silt and clay soils are rather low, we anticipate water may tend to at times become locally perched or trapped in places in the upper soils, particularly where any fill is present. Groundwater conditions, and the extent of any perched water, should be expected to vary with seasonal fluctuations in precipitation and runoff. Additionally, grade adjustments on and around the site, as well as surrounding drainage improvements, may affect the water table.

GEOTECHNICAL OVERVIEW

The project site is considered suitable for support of the proposed building addition using conventional shallow spread foundations and slab-on-grade design. Based on the conditions

disclosed by our investigation, the following general guidelines were developed to assist in planning for design and construction.

- New foundations and floor slabs may be supported on undisturbed native soils, or on imported structural fill which is placed over the native soils after the removal of any existing fill, remains of former structures or otherwise unsuitable materials which may be found.

- We expect the soils excavated onsite will be composed primarily of either sandy silt or silty clay, materials we consider unsuitable for reuse as fill or backfill in and around the building. It should be assumed that an imported granular fill will be required for the purposes of general fill and backfill about the building. The excavated soils should be wasted off-site.

- Provided the proposed basement floor level will essentially match that of the existing building, and that the depth of any new elevator pit/sump is also configured similarly to that which currently exists, groundwater should in general be below foundation excavation depths and should not be a significant factor in planning for design and construction of the building addition. If perched water is encountered during construction, it is expected to be limited in volume and standard sump and pump methods should be sufficient for its removal. Dewatering is a means and methods consideration for the contractor.

The following sections of this report provide more detailed recommendations to assist in planning for the geotechnical aspects of the project. We should be provided with the opportunity to review plans and specifications prior to their release for bidding to confirm that our recommendations were properly understood and implemented, and to allow us to refine our recommendations, if warranted, based upon the final design. The **General Comments** section provides an understanding of the report limitations.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site classification is required to determine the Seismic Design Category for a structure. The seismic Site Class is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC).

Seismic Site Classification

In our estimation, the seismic Site Class is D. This determination is made based upon the results of shear wave velocity testing completed in the silt and clay soils at several sites in the general project area, where this testing has found that average shear wave velocities in the upper 100 feet consistently exceed 600 feet per second. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth, if desired.

EARTHWORK

Earthwork is anticipated to include removal of existing pavements and ancillary structures, stabilization of subgrade surfaces as necessary, foundation excavation and associated site fill and backfill. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered suitable in our geotechnical engineering evaluation for foundations and floor slabs.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility is neither implied nor shall it be inferred.

Site Preparation

Site preparation should begin with stripping of pavements and any topsoil or surficial organic matter as applicable from the new building area, along with whatever existing structures are present. Any existing fill or disturbed soils, along with any old building foundations, slabs or below grade structures should be removed in their entirety from beneath the proposed building footprint, extending at least five feet beyond its perimeter where achievable. This distance may be reduced depending on the conditions encountered and as recommended by the Geotechnical Engineer, but in no case be less than two feet laterally from the edge of any foundation element.

Prior to placing fills to raise site grades and/or after cuts are made to the plan subgrade elevations, the subgrades should be proof-rolled using a steel drum roller with a static weight of at least seven tons. The roller should operate in its static mode, unless requested otherwise by the Geotechnical Engineer observing the work, and travel at a speed not exceeding three feet per second (two miles per hour). The roller should complete at least two passes over all subgrade surfaces in opposing directions. The method of proof-rolling may be modified by the Geotechnical Engineer based upon the conditions revealed at the time of construction.

Soft areas identified by the proof-rolling should be investigated to determine the cause and stabilized accordingly. These investigations may include the excavation of test pits. Where existing fills are found and determined by to be unsuitable by the Geotechnical Engineer, they should be removed and replaced as deemed necessary.

Fill Material Types

Imported Structural Fill should be used as fill/backfill within the proposed building area. The imported fill should consist of sand and gravel which meets the limits of gradation given below.

Any imported materials should be free of recycled concrete, asphalt, bricks, glass, and pyritic shale rock.

IMPORTED STRUCTURAL FILL

Sieve Size	Percent Finer
3”	100
¼”	30 to 75
No. 40	5 to 40
No. 200	0 to 10

As previously noted, we recommend against the reuse of excavated onsite soils for fill or backfill beneath or around the building.

Fill Compaction Requirements

Fills beneath the building pad should be placed in uniform loose layers no more than about one-foot thick where heavy vibratory compaction equipment is used. Thinner lifts should be used where hand operated equipment is required for compaction. Each lift should be compacted to no less than 95 percent of its maximum dry density as determined by the Modified Proctor Compaction Test, ASTM D1557. In landscape areas, if any, the compaction requirement may be relaxed to 90 percent of maximum dry density.

Grading and Drainage

All grades should provide effective drainage away from the building during and after construction, with such drainage maintained throughout the life of the structure. Water retained next to buildings can result in soil movements greater than those outlined in this report, which may in turn lead to unsatisfactory differential floor slab and/or foundation displacements, cracked slabs and walls, or roof leaks.

Temporary Excavation Slopes

Excavations must be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P and its appendices, along with any state and local codes, as applicable. The contractor should be aware that slope height, slope inclination, and excavation depth should in no instance exceed OSHA regulations. Flatter slopes than those stipulated by the regulations or temporary shoring may be required depending upon the soil/groundwater conditions encountered and other external factors. OSHA regulations are strictly enforced and if they are not followed, the owner, contractor, and/or earthwork and utility subcontractor could be liable and subject to substantial penalties.

Excavations should be completed so as not to undermine the foundations of adjacent structures or utilities that are to remain in place. In general, excavations should not encroach within a zone of influence defined by a line extending out and down from any existing structures at an inclination of 1V:1.5H. Excavations that encroach within this zone should be sheeted, shored and/or braced

as required to support the soil and adjacent structure loads, or the structure should be underpinned to establish bearing at a deeper level.

Excavation Support

Where supported excavations are required to excavate to the planned grades for the proposed addition and associated site grading, the type and design of the excavation support system must be compatible with the site geometry, subsurface conditions, the planned building foundation construction, and provide adequate support for adjacent structures, streets and utilities. Any temporary support walls to be constructed at this site and components thereof should be designed for the maximum combination of loading that may occur in each stage of excavation and bracing. Recommended soil parameters for use in the design of excavation support at this site are presented below.

Note that a pre-construction building condition survey and vibration monitoring program should be included with any shoring design. Excavation support systems should be a drilled in type, such as soldier pile and lagging. We recommend against driven or vibrated support systems in this area due to its urban setting and potentially historic nature/age of buildings in the immediate project area.

Excavation support can be designed and bid or left to the contractor and their consultant to design and install. If the design of temporary earth support is to be performed by the contractor, it should be submitted to the design team for review. Their submittal should include assumptions made regarding soil properties, geometry of the excavation, lateral pressure diagrams, locations and magnitudes of all surcharge loads and wall design calculations, including deflection analyses and a proposed monitoring program for the construction period. The temporary earth support should be designed and stamped by a Professional Engineer licensed in the State of New York.

The following soil parameters may be assumed for design of temporary excavation support:

Material	Total Moist Unit Weight (pcf)	Angle of Internal Friction (degrees)	Cohesion (psf)
Sandy Silt (GeoModel Layer 1)	115	28	0
Brown or Gray Clay (GeoModel Layers 2 and 3)	115	26	0

* Long-term effective stress parameters as presented in the table are recommended for use

Groundwater may be assumed at a depth of 14 feet below existing grade for the purposes of excavation support design.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of topsoil and any unsuitable fills, proof-rolling, and mitigation of any areas identified as needing improvement through proof-rolling. Each lift of new compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts.

Foundation bearing grades and subgrades for floor slabs should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

It should be understood that subsurface conditions will be more fully known when the site is excavated. The continuation of the Geotechnical Engineer into the construction phase of the project will allow for validation of the subsurface conditions assumed to exist for this study and in the development of the design recommendations in this report, along with assessing any variations, providing interim recommendations as necessary and reviewing associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted previously in the **Earthwork** section and below under the **Foundation Construction Considerations**, the following design parameters may be assumed.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing Pressure [1, 2]	3,000 pounds per square foot (psf)
Required Bearing Stratum [3]	Undisturbed native soils or structural fill placed over the native soils after removal of any existing fills
Minimum Foundation Dimensions	Columns: 36 inches Continuous: 24 inches
Ultimate Coefficient of Sliding Friction [4]	0.30 (concrete on native soils) 0.45 (concrete on imported granular fill)
Minimum Embedment below Finished Grade [5]	Exterior footings: 48 inches Interior footings in heated areas: 24 inches Interior footings in unheated areas: 48 inches
Estimated Total Settlement from Structural Loads [2]	Less than about one (1) inch

Item	Description
Estimated Differential Settlement [2, 6]	About 75% of total settlement

1. The maximum net allowable bearing pressure is the pressure which exceeds the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied.
2. Values provided are for maximum loads noted in **Project Description**. The settlements should occur relatively quickly as construction proceeds and load increments are applied.
3. The bearing grades should be prepared per the recommendations presented below in the **Foundation Construction Considerations**.
4. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
5. Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure. Interior footings in heated area may be seated at the 24-inch depth if allowed by local building codes.
6. Differential settlements are as measured over a span of 50 feet.

Where existing and new foundations will abut, they should match in bearing elevation. Additionally, new foundations should be positioned so as not to impose new loads upon existing foundation walls unless the walls are designed to accommodate the added load.

A standard perimeter foundation drain should be provided to collect and relieve any water which enters the backfill soils after construction is complete. The drains should consist of nominal four-inch diameter perforated PVC or corrugated HDPE pipe set within ± 12 inches of clean crushed stone composed of ASTM C33 Blend 57 material. The stone should be enveloped with a non-woven synthetic filter fabric meeting the requirements of NYSDOT standard specifications table 737-01C for drainage geotextile. All drains should be provided with clean outs for their maintenance.

Foundation Construction Considerations

The foundations may be seated directly on undisturbed native soils, or on structural fill which is placed over the native soils after removal of any existing fill, along with any remains of former structures or otherwise unsuitable materials that may be found. If over-excavation is required beneath the foundations to remove unsuitable material, the excavation should extend horizontally beyond each side of the foundation a distance equal to at least one-half the depth of the undercut below the final bearing grade elevation. Replacement material should meet the specification and compaction guidelines for structural fill as outlined herein.

Foundation bearing grades should be prepared using an excavator equipped with a smooth blade bucket to limit disturbance to the subgrades. We caution the silt and clay soils at this site will be sensitive to foot traffic typical for construction of foundations, especially if water collects upon them. In order to protect the excavated subgrades, the silt and clay soils may be over-excavated a minimum of 6 inches and replaced a with a base of clean crushed stone to establish a more stable base for construction and to assist in dewatering. The stone thickness should be increased to 12 inches in the event the foundation excavations extend into the gray silt and clay strata. The

stone should be an ASTM C33 Blend 57 aggregate which is separated from the surrounding soils with a drainage geotextile as described above. As an alternative to over-excavation, consideration may be given to protection of the grades with a lean concrete mud mat placed immediately after their excavation and acceptance. The mud mat should consist of lean concrete with a minimum design compressive strength of 2,000 psi at 28 days age. The mud mat should be a minimum of 3 inches thick.

All final bearing grades should be relatively firm, stable, and free of loose soil, mud, water and frost. The Geotechnical Engineer should approve the condition of the foundation bearing grades immediately prior to placement of crushed stone or lean concrete over the grades.

FLOOR SLABS

Floor Slab Design Parameters

The floor slabs should be constructed upon a minimum six-inch thick subbase course which conforms to the requirements for NYSDOT Type 2 Subbase or ASTM C33 Blend 57 aggregate. Consideration should be given to using a thicker subbase course in areas subject to heavier loads and/or use, or those exposed to freezing temperatures.

The use of a vapor retarder along with a base course of ASTM C33 Blend 57 aggregate should be considered beneath concrete slabs-on-grade to be covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding its use and placement.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual.

Floor slab subgrades should be prepared as outlined in the Earthwork section herein. Under these conditions, a modulus of subgrade reaction equal to 150 pounds per cubic inch (psi/in) may be assumed at the top of the stone base layer for slab design purposes.

Floor Slab Construction Considerations

Even with the base course recommended above, we caution that the subgrades may not support repeated heavy construction traffic or telehandlers 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.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab subbase course. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

LATERAL EARTH PRESSURES

All earth-retaining foundation walls or structures should be designed to resist the lateral pressures generated by earth backfill and any temporary or permanent surcharge loads. Active earth pressures may be assumed for walls that are free to deflect as the backfill is placed. At-rest earth pressures should be assumed for walls that are braced prior to backfilling or applying surcharge loads. The following design parameters are provided to assist in calculating lateral earth pressures, whichever apply, and to analyze the stability of unbraced walls by sliding and overturning.

- Soil angle of internal friction - 30 degrees
- Coefficient of At-Rest earth pressure (k_o) - 0.50
- Coefficient of Active earth pressure (k_a) - 0.33
- Coefficient of Passive earth pressure (k_p) - 3.00
- Total unit weight of compacted soil - 130 pcf
- Coefficient of sliding friction - 0.30 (concrete on native soils)
  0.45 (concrete on imported granular fill)

The recommended design parameters assume that backfill consists of imported Structural Fill as described in the **Earthwork** section herein, idealized non-sloping conditions on each side of the wall, and that the backfill remains permanently well-drained. As previously noted, foundation drains should be installed to prevent groundwater from becoming trapped in the backfill soils, and damp proofing and/or waterproofing of basement floors and foundation walls should be provided as appropriate.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

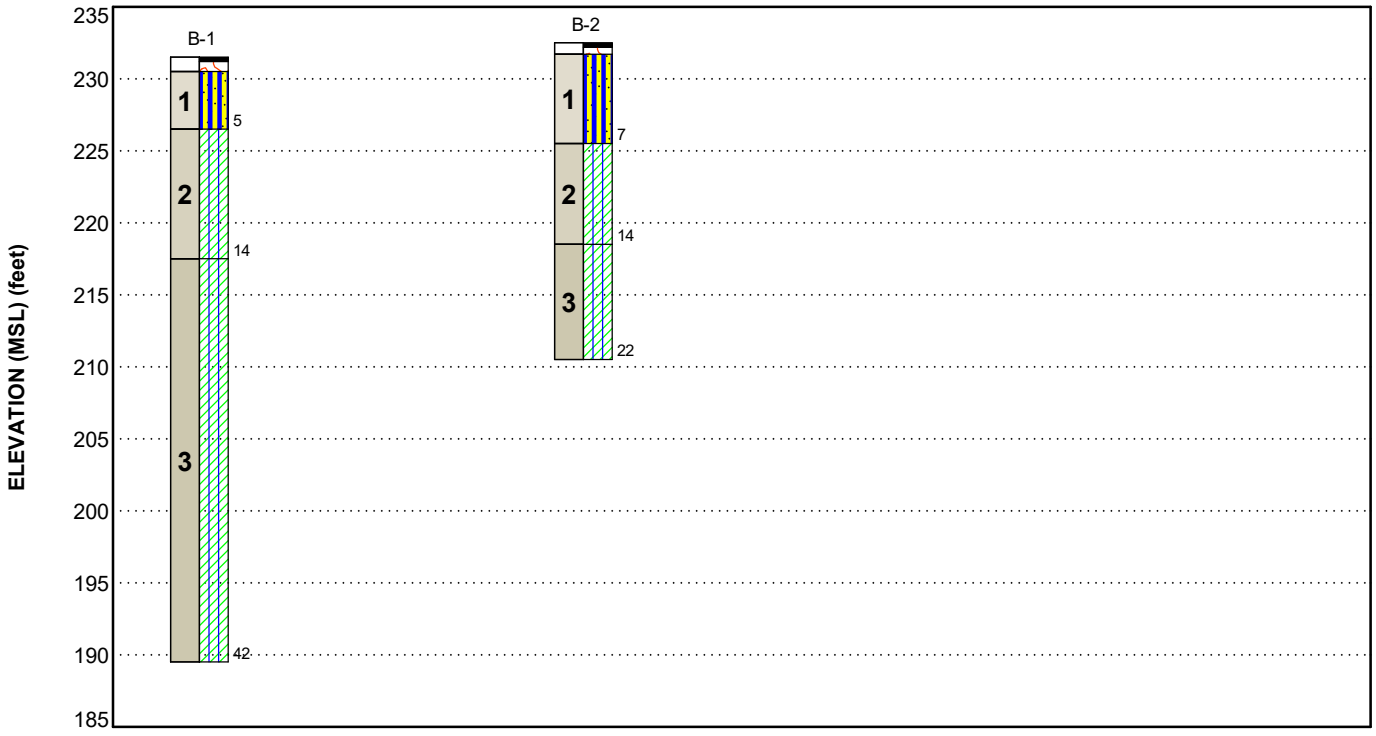
Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements and design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

Contents:

GEOMODEL

Hospitality House ■ Albany, NY
Terracon Project No. JB215093



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Sandy Silt**	Brown sandy silt w/ little clay, possible fill or reworked
2	**Brown Clay**	Brown silt and clay, relatively stiff
3	**Gray Clay**	Gray silt and clay, relatively soft

LEGEND

- Asphalt
- Aggregate Base Course
- Sandy Silt
- Silty Clay

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Test ID	Depth (feet)	Location
B-1 and B-2	22.0 and 42.0	Proposed building footprint

Test Boring Layout and Elevations: The test locations were selected by Terracon and were established in the field using a hand-held GPS unit, taped measurements and/or visual reference from existing site features. The borehole locations were determined on the basis of the proposed building layout described to us, within the limitations of access, existing structures and utilities.

Existing ground surface elevation at each borehole location was estimated based upon our interpolation between topographic contours shown on the site plan provided to us. If more precise locations and/or elevations are desired, the as-completed test locations should be surveyed.

Subsurface Exploration Procedures: The test borings were completed using a standard rotary drill rig equipped with hollow stem augers. As the augers were advanced, the soils were sampled at intervals of five feet or less in accordance with the Standard Method for Penetration Test and Split-Barrel Sampling of Soils, ASTM D1586. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon is driven into the ground by a 140-pound automatic hammer falling 30-inches. The number of blows required to advance the sampling spoon the middle 12-inches of a normal 24-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the corresponding test depths. Upon completion of drilling the boreholes were backfilled with auger cuttings, concrete cylinders and/or sand and the surface restored in kind.

Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. The sampling depths, penetration distances, and other sampling information were recorded on the field boring logs.

The samples were placed in appropriate containers and taken to our laboratory for visual classification by a Geologist or Geotechnical Engineer. The soils were described based on the material's color, texture, plasticity and moisture Soil classifications are in general accordance with the Unified Soil Classification System (USCS) as summarized herein. Final boring logs were prepared, and they represent the Geotechnical Engineer's interpretation based on the field logs and visual classifications, along with any laboratory testing performed.

Laboratory Testing

Selected samples recovered from the test borings were submitted for laboratory testing as part of the subsurface investigation, to confirm the visual classifications and to provide quantitative index properties for use in the geotechnical evaluation. This testing was performed in general accordance with the following standard methods:

- ASTM D2216 - Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil - and Rock by Mass (3 samples tested)
- ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils (w/ hydrometer) (1 sample tested)
- ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils (2 samples tested)

SITE LOCATION AND EXPLORATION PLANS

Contents:

Note: All attachments are one page unless noted above

SITE LOCATION

Hospitality House ■ Albany, NY
June 2021 ■ Terracon Project No. JB215093

Terracon GeoReport

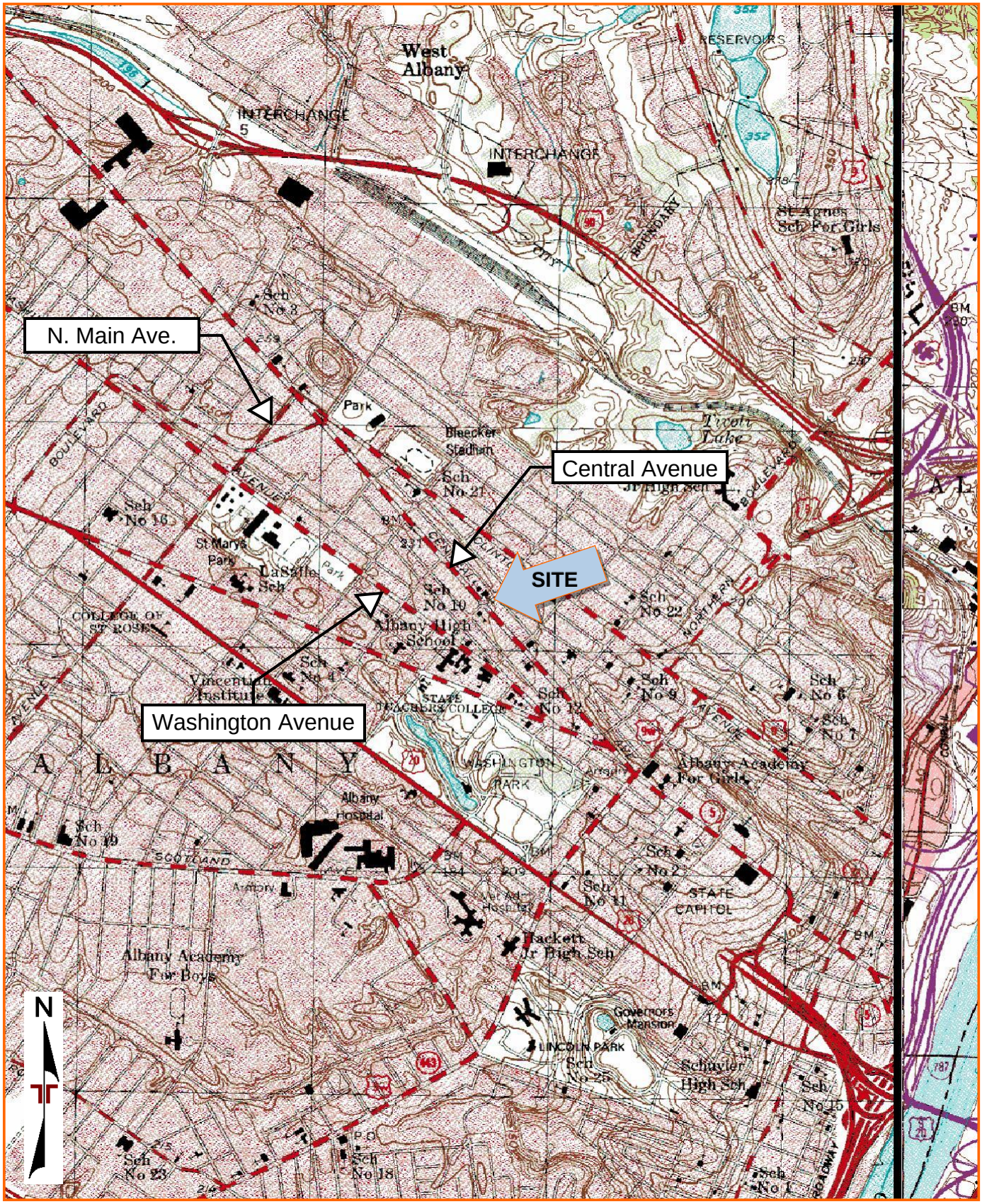


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: ALBANY, NY (1/1/1994) and TROY SOUTH, NY (1/1/1980).

EXPLORATION PLAN

Hospitality House ■ Albany, NY

June 2021 ■ Terracon Project No. JB215093

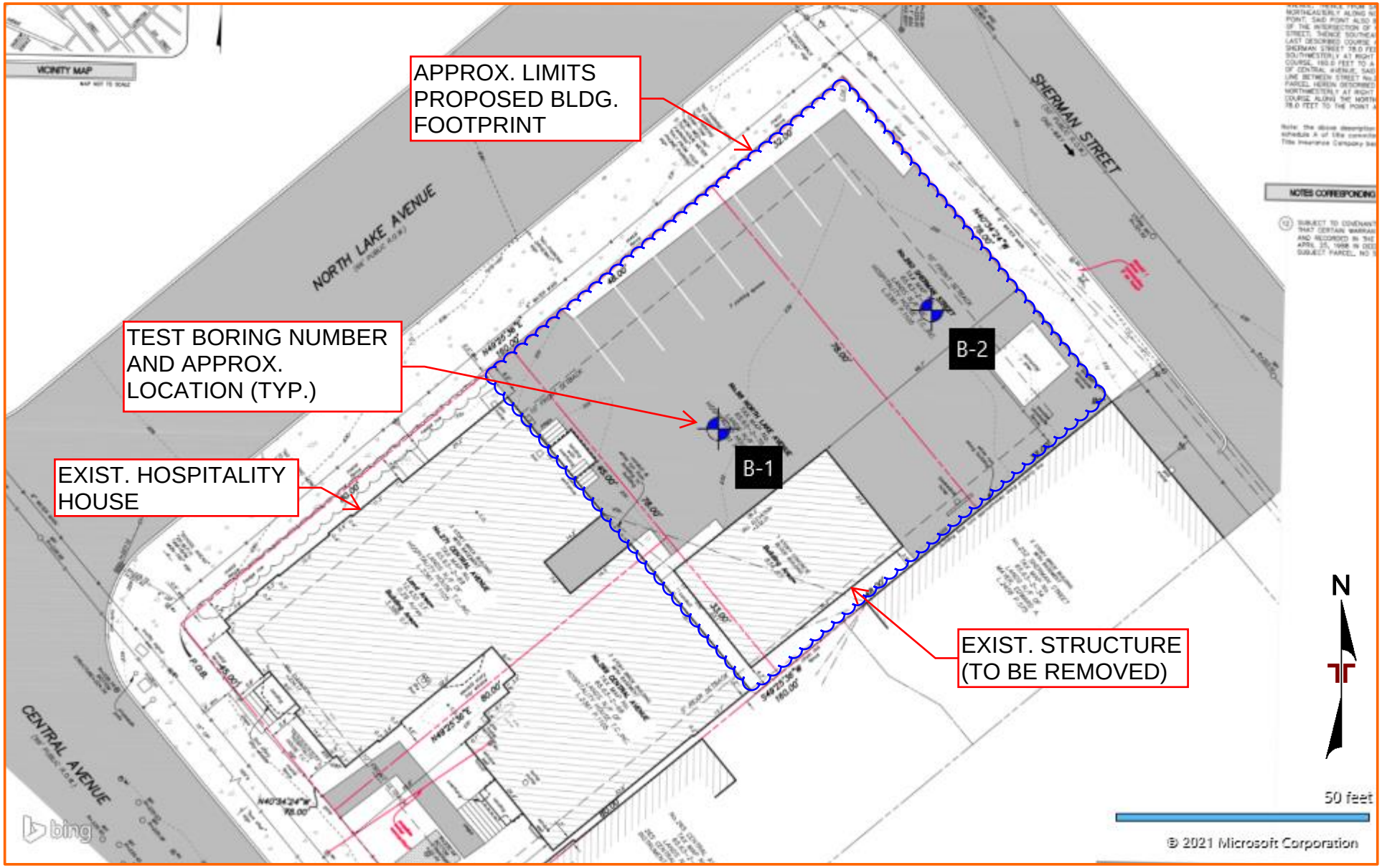


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

BASE MAP FURNISHED BY CLIENT.

EXPLORATION RESULTS

Contents:

Test Boring Logs (B-1 and B-2) (3 pages)
Laboratory Test Results (4 pages)

Note: All attachments are one page unless noted above

BORING LOG NO. B-1

PROJECT: Hospitality House

CLIENT: Architecture + Troy, NY

SITE: 271 Central Avenue Albany, NY

LOCATION See Exploration Plan

Latitude: 42.6638° Longitude: -73.7707°

Approximate Surface Elev.: 231.5 (Ft.) +/-

MODEL LAYER	DEPTH	ELEVATION (Ft.)		DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS
	0.3	231+/-	**ASPHALT**, approx. 4" asphalt pavement at ground surface				
	1.0	230.5+/-	**AGGREGATE BASE COURSE**				
1			**SANDY SILT (ML)**, clayey, brown, medium stiff			19.2	3-3-3-3 N=6
						14.4	4-4-4-4 N=8
	5.0	226.5+/-		5			
2			**SILTY CLAY (CL-ML)**, brown, medium stiff to very stiff			21.6	4-7-2-3 N=9
						24	8-9-11-13 N=20
				10		24	WH-2-4-4 N=6
	14.0	217.5+/-					
3			**SILTY CLAY (CL-ML)**, gray, soft to very soft	15		24	2-2-1-3 N=3
				20		24	1-1-1-2 N=2
				25			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4 1/4" HSA

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:
- logged by JSH
- WH = weight of hammer

WATER LEVEL OBSERVATIONS

No meaurable groundwater in augers upon completion of sampling.

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Started: 05-19-2021 | Boring Completed: 05-19-2021

Drill Rig: Diedrich D-50 | Driller: SM

Project No.: JB215093

BORING LOG NO. B-1

PROJECT: Hospitality House

CLIENT: Architecture + Troy, NY

SITE: 271 Central Avenue Albany, NY

LOCATION See Exploration Plan

Latitude: 42.6638° Longitude: -73.7707°

Approximate Surface Elev.: 231.5 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
3			**SILTY CLAY (CL-ML)**, gray, soft to very soft *(continued)*				24	WH-WH-WH-WH N=WH	
				30			24	WH-WH-WH-WH N=WH	
				35			24	WH-WH-WH-WH N=WH	
				40			24	WH-WH-WH-WH N=WH	
		42.0	189.5+/-						
			Boring Terminated at 42 Feet						

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4 1/4" HSA

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:

- WH = weight of hammer

WATER LEVEL OBSERVATIONS

No meaurable groundwater in augers upon completion of sampling.

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Started: 05-19-2021 | Boring Completed: 05-19-2021

Drill Rig: Diedrich D-50 | Driller: SM

Project No.: JB215093

BORING LOG NO. B-2

PROJECT: Hospitality House

CLIENT: Architecture + Troy, NY

SITE: 271 Central Avenue Albany, NY

LOCATION See Exploration Plan

Latitude: 42.6639° Longitude: -73.7705°

Approximate Surface Elev.: 232.5 (Ft.) +/-

MODEL LAYER	GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	WATER CONTENT (%)
		0.3 **ASPHALT**, approx. 4" asphalt pavement at ground surface	232+/-						
		0.8 **AGGREGATE BASE COURSE**	231.5+/-						
1		**SANDY SILT (ML)**, clayey, brown, medium stiff to stiff				X	19.2	3-4-3-2 N=7	
						X	13.2	1-3-3-4 N=6	
				5		X	19.2	6-6-8-4 N=14	
		- grades v. fine sand and silt							
		7.0	225.5+/-						
2		**SILTY CLAY (CL-ML)**, brown, stiff				X	21.6	4-5-7-10 N=12	
				10		X	24	3-4-6-6 N=10	
		14.0	218.5+/-						
3		**SILTY CLAY (CL-ML)**, gray, soft to very soft							
				15		X	24	4-2-2-3 N=4	
				20		X	24	WH-WH-1-2 N=1	
		- fine sand parting noted							
		22.0	210.5+/-						
		Boring Terminated at 22 Feet							

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4 1/4" HSA

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were interpolated from a topographic site plan.

Notes:
- logged by JSH
- WH = weight of hammer

WATER LEVEL OBSERVATIONS

No meaurable groundwater in augers upon completion of sampling.

Terracon
30 Corporate Cir Ste 201
Albany, NY

Boring Started: 05-19-2021 | Boring Completed: 05-19-2021

Drill Rig: Diedrich D-50 | Driller: SM

Project No.: JB215093

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	18.0	1.8	14.6	54.1	11.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
0.75"	100.0		
0.5"	100.0		
0.375"	100.0		
0.25"	100.0		
#4	99.8		
#10	81.8		
#40	80.0		
#100	77.2		
#200	65.4		

* (no specification provided)

Material Description

Sandy silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 2.8360 D_{85}= 2.3217 D_{60}= 0.0676
D_{50}= 0.0574 D_{30}= 0.0412 D_{15}= 0.0089
D_{10}= 0.0030 C_u= 22.89 C_c= 8.53

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Per ASTM D422

Source of Sample: B-1 3'-5'

Date: 6-16-21

Terracon Consultants-NY, Inc.

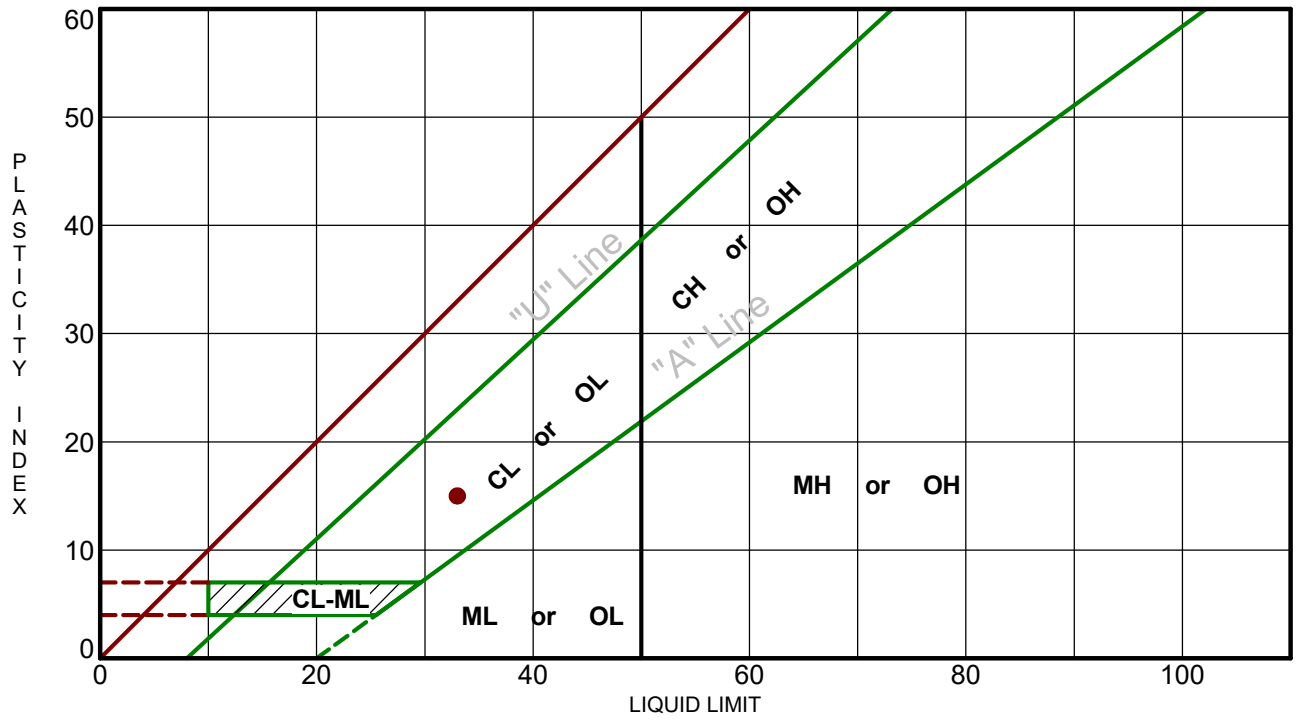
Albany, NY

Client: Architecture + NY
Project: Hospitality House
Albany, NY
Project No: JB215093 **Figure** B-1 3'-5'

Tested By: AB **Checked By:** JH

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
● B-1	7 - 9	33	18	15		CL	Lean Clay

PROJECT: Hospitality House

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Terracon
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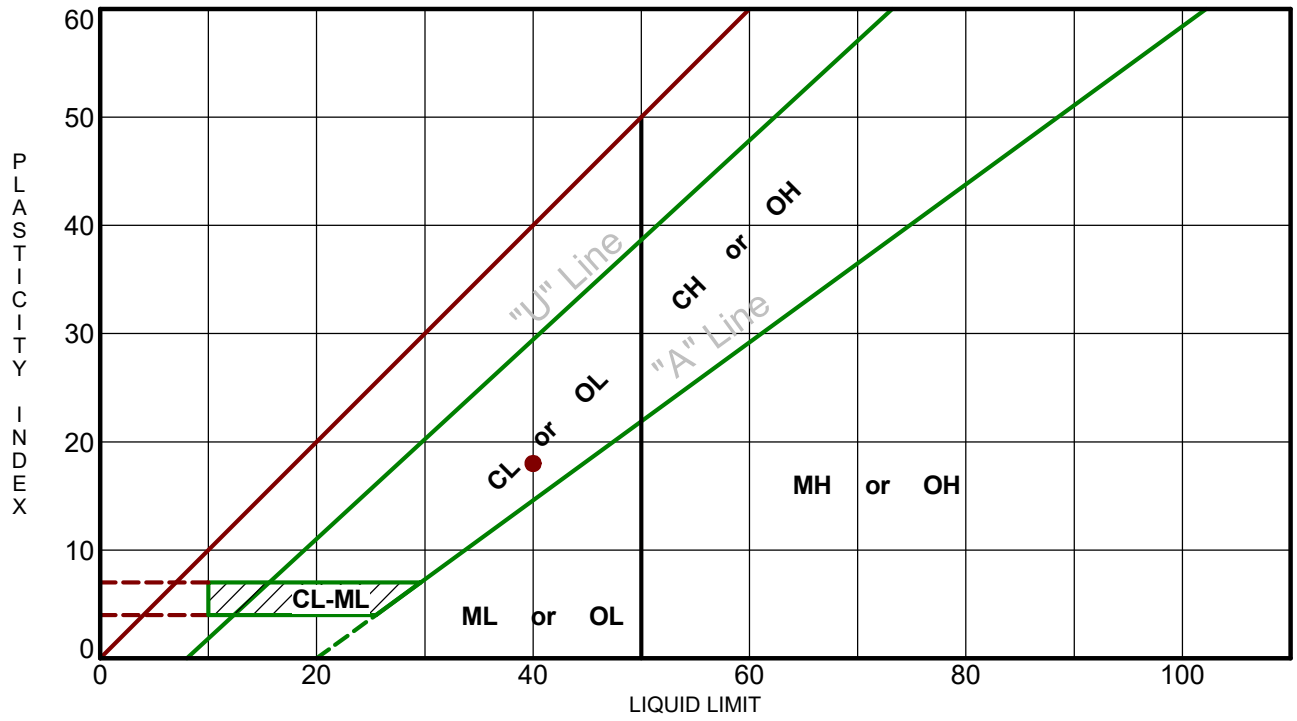
Albany, NY

CLIENT: Architecture +
Troy, NY

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
● B-1	20 - 22	40	22	18		CL	Lean Clay

PROJECT: Hospitality House

PROJECT NUMBER: JB215093

SITE: 271 Central Avenue
Albany, NY

Terracon
30 Corporate Cir Ste 201
Albany, NY

CLIENT: Architecture +
Troy, NY

Summary of Laboratory Results

BORING ID	Depth (Ft.)	Water Content (%)
B-1	3-5	20.9
B-1	7-9	24.0
B-1	20-22	47.0

PROJECT: Hospitality House

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SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
Hospitality House ■ Albany, NY
Terracon Project No. JB215093

Terracon GeoReport

SAMPLING	WATER LEVEL	FIELD TESTS
Split Spoon	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** **Cave In Encountered** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.