CONCEPT SUBMISSION

NARRATIVE DESCRIPTION

Proposed Automobile Dealership for DePaula Maserati/Alfa Romeo

947 Troy-Schenectady Road

Town of Colonie

County of Albany

State of New York

Prepared by:

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September 25, 2017

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INTRODUCTION:

Hershberg & Hershberg were retained by the applicant for approval of this project DePaula Chevrolet, Inc. with an address of 785 Central Avenue, Albany, NY 12206 to provide and civil engineering services which includes the preparation of a Site Plan on the proposed site at the intersection of Troy-Schenectady Road and Mill Road.

DESCRIPTION OF EXISTING SITE:

PARCEL AREA

The existing site is a 6.22± acre parcel which will be the combination of two lots currently known as 947 Troy-Schenectady Road & 2 Mill Road. The land is currently occupied by two warehouses totaling 15,600 ± SF and a paved area and driveways occupying 0.98 acre. The site is partially wooded and has one jurisdictional wetland along the west side of the site around a protected stream course. The site consists of two parcels as follows:

Tax Map Parcel No.	Address	Parcel Area
18.2-1-14.2	947 Troy Schenectady Road	2.36 Acres
18.2-1-14.3	2 Mill Road	3.86 Acres

The merged parcel is proposed to be known as 947 Troy Schenectady Road. The site is shown on the aerial photo below:

Fig. No. 1 - Aerial Photo of Existing Site

PARCEL ZONING

The site lies entirely within the Commercial Office Residential (COR) Zone.

WATERCOURSES

There is a protected watercourse at the base of a slope along the west side of the parcel. No construction is proposed in the 100 foot buffer zone.

EXISTING WETLANDS

There are Federal Wetlands (Waters of the United States of America) that exist on the site. They surround the protected stream course and will not be disturbed by this project.

FLOOD PLAIN

The site to be developed lies entirely within Zone X (Area of Minimal Flooding). A Firmette of Flood Insurance Rate Map 360001 C0068D is reproduced below.

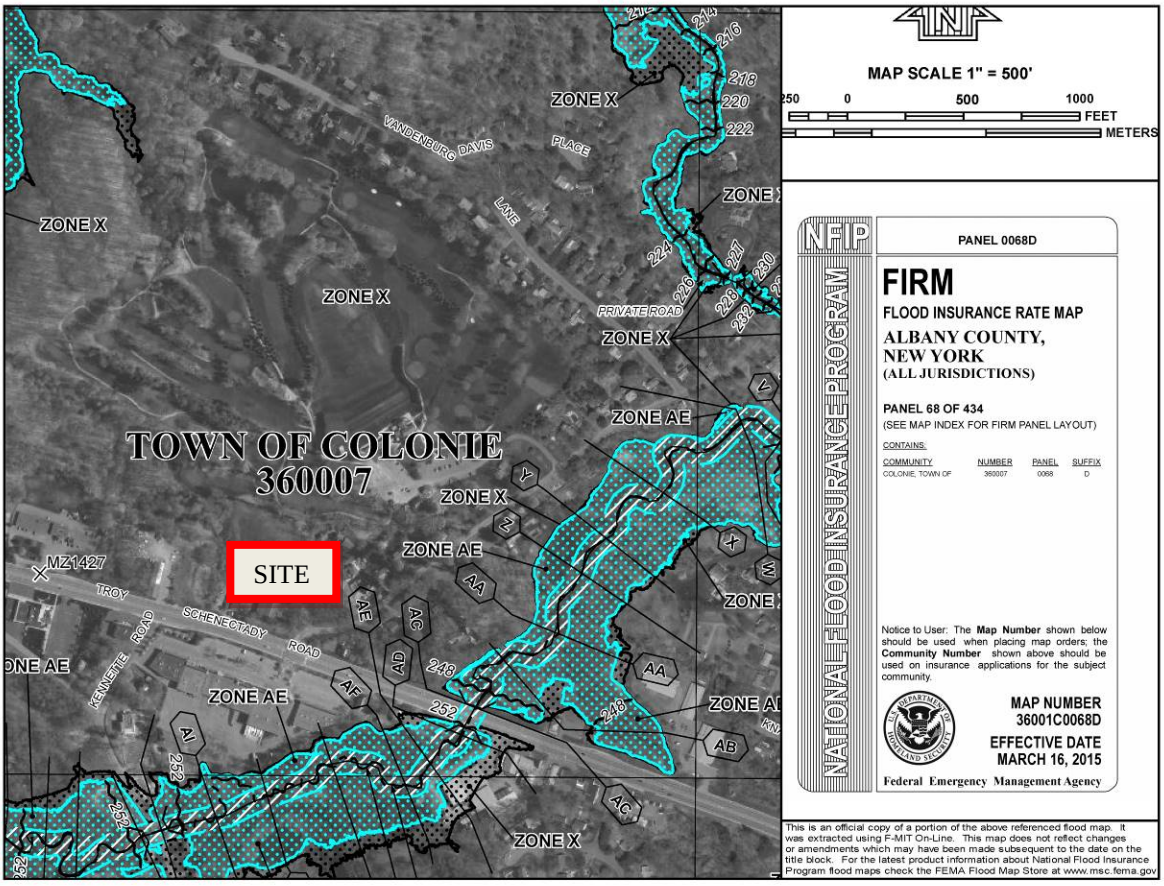


Fig. No. 2 - Firmette of Existing Site

EXISTING USAGE

The land is currently occupied by two warehouses totaling 15,600 ± SF and a paved area and driveways occupying 0.98 acre. The site is partially wooded and has one jurisdictional wetland along the west side of the site around a protected stream course.

EXISTING SOILS

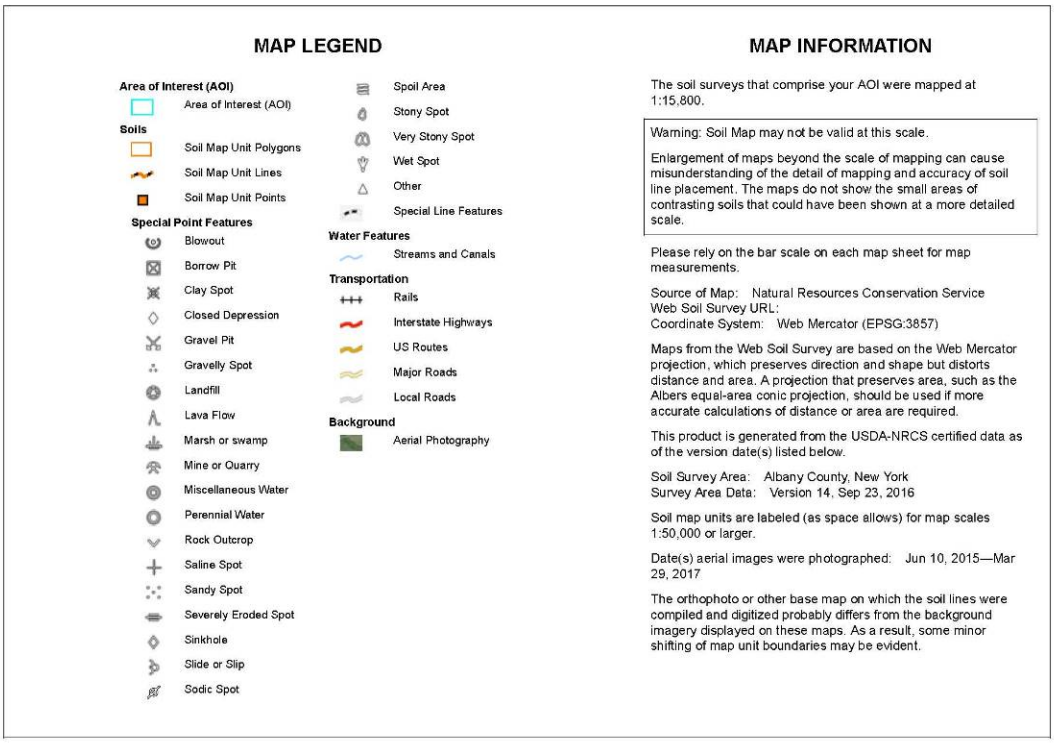
Some of the site has been filled, graded and paved so that the original soil profiles were, in all likelihood, disturbed over much of the site. The Web Soil Survey indicates the following soils within the limits of the project:

CoC, Colonie loamy fine sand, rolling, This rolling soil is very deep and well drained to somewhat excessively drained…..Typically the surface layer is dark brown loamy fine sand about 7 inches thick. The subsoil is about 61 inches thick. It is yellowish brown and dark yellowish brown lamy fine sand…...[1]

Us, Urban land, Udipsamments. This map unit consists of nearly level to gently sloping areas of Urban landUrban land is mostly covered by asphalt, concrete, buildings, or other impervious materials. Udipsamments are sandy soils that have been disturbed by grading or filling during construction.[2]

[1] **Soil Survey of Albany County, NY**, USDA, Soil Conservation Service 1992, Pg.40
[2] **Ibid.** Pg. 87

Fig. No. 3 – Web Soil Survey Map



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 14, Sep 23, 2016

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.

Fig. No. 4 – Web Soil Survey Map Information

Map Unit Legend

Albany County, New York (NY001)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
CoC	Colonie loamy fine sand, rolling	5.1	82.8%
Us	Urban land-Udipsamments complex, 0 to 8 percent slopes	1.1	17.2%
Totals for Area of Interest		**6.2**	**100.0%**

Fig. No. 5 – Web Soil Survey Map Unit Legend

The Schenectady-Niskayuna Sole Source Aquifer impacts many areas within the Town of Colonie. The area of this project is inside the sole source aquifer as shown on the map below:

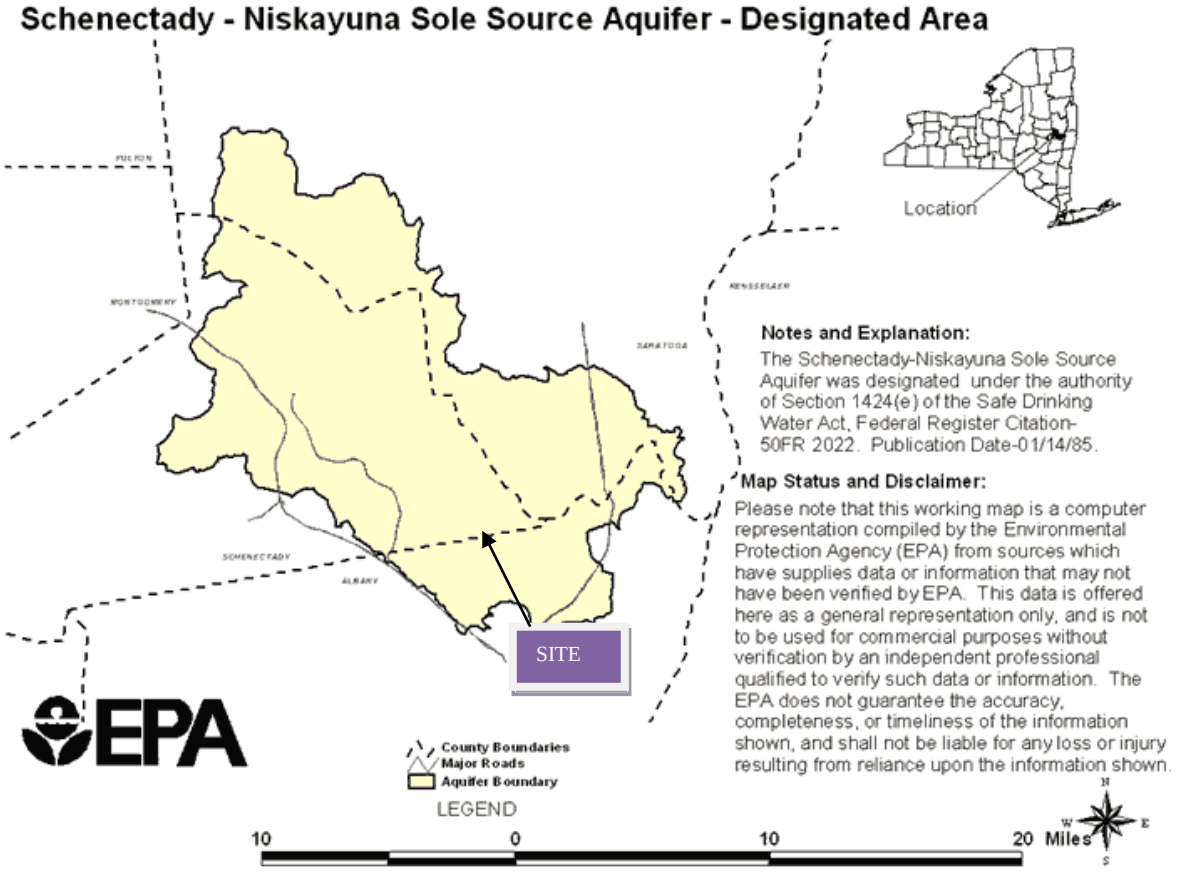


Fig. No. 6 -Schenectady Niskayuna Sole Source Aquifer

Dente Engineering performed soil borings & infiltration tests on the site ad found varying soil conditions as suggested by the Web Soil Survey. The Geotechnical Evaluation is in Appendix 3.

EXISTING DRAINAGE

The majority of the existing drainage from the site runs to the west to the protected stream course along the Westerly portion of the site. The portion of the site adjoining Mill Road and a portion of Troy Schenectady Road drains to a

drainage system in the roadway. There does not appear to be any existing stormwater management facilities in place serving the subject site although a catch basin exists on the site for which no discharge could be relocated although a pipe running in the Northwesterly direction from the catch basin was noted.

EXISTING WATER SYSTEM

A 20" distribution main runs along the north side Mill Road and crosses Troy Schenectady Road. A 12" DIP runs westerly within the Troy Schenectady Road ROW along the property frontage. The existing building is served by water service connection which is proposed to be abandoned.

EXISTING SEWER SYSTEM

The Town of Colonie Department of Public Works, Pure Waters Division maintains a sanitary sewer collection system which terminates near the westerly limits of the property along Troy Schenectady Road within an easement. The existing building is served by a sewer lateral which is proposed to be abandoned.

EXISTING DEMOGRAPHICS

The site lies within the North Colonie Central School District, which is served by Bought Hills Elementary School, Shaker Junior High School & Shaker High School.

DESCRIPTION OF INTENDED SITE DEVELOPMENT AND USE

The Applicant will merge the two tax map parcels. The main warehouse/office building will be demolished. One existing warehouse of 5,500 +/- SF will be reused for parts storage. The proposed project is to construct a new one story 16,136 +/- SF auto dealership. This will include a new right-in, right out driveway on Troy Schenectady Road replacing an existing driveway and a new driveway from Mill Road replacing an

existing driveway. Also included is parking for 192 cars including an area with stacked cars for vehicle storage.

CONSTRUCTION SEQUENCE

The construction of the building will be built in a one phase. There will be a general sequence to the construction which is as follows:

1. Demolish existing larger warehouse
2. Construct the new Facility for DePaula Maserati/Alfa Romeo.
3. Rehabilitate smaller existing warehouse for use as a part warehouse.
4. Complete site work

BUSINESS STATISITCS

Hours of operation will be as follows:

Mon – Friday 7 AM to 6PM
Saturday: 8:30 AM to 6PM

The maximum employees per shift to occupy this building upon completion is estimated to be 12 with a total staff of 24.

SITE STATISITCS

The proposed and existing site statistics are shown on the site plan. They are as follows for the existing site (after parcel merger):

Description	Area (SF)	Area (acres)	%
Building	15,390	0.35	5.6
Pavement	42,686	0.98	15.8
Green Space	212,987	4.89	78.6
Total	271,063	6.22	100.0

Fig. No. 7 -Existing Site Usage Table

The statistics for the site if developed as shown on the site plan is as follows (after parcel merger);

Description	Area (SF)	Area (acres)	%
Building	21,678	0.50	8.0
Pavement	95,856	2.20	35.4
Green Space	153,529	3.52	56.6
Total	271,063	6.22	100.0

Fig. No. 8 - Proposed Site Usage Table

INCENTIVE ZONING

Since the minimum required green space of 35% will be provided within the COR Zone, no incentive zoning will be necessary.

PARKING

The *Zoning Ordinance* requires 1 parking space per 225 SF of office floor area, 1 parking space per 500 SF of warehouse floor area and 2 parking spaces per service bay. Based upon 10,465 SF of office space (including showrooms and service receiving area), 5,500 SF of warehouse space and 8 service bays, 74 parking spaces are required. The Applicant believes that a total of 192 parking spaces would meet the potential demand for parking and vehicle storage/display/inventory. Two parking spaces have been identified for Electric Vehicle (EV) charging stations.

WAIVER REQUEST

The applicant has requested waivers to permit the building to be set further back than 25 feet from Troy-Schectady Road and eliminate the minimum of 20 sq. ft. of landscaped island per parking space included in the interior of the parking area where vehicle storage is proposed. See Appendix 2 for the request for

waiver letter in accordance with Article 9 of the COR design standards. These waiver requests were reviewed by the Applicant in front of the Planning Board on February 28, 2017.

With regard to a waiver request as per §180-40 – Commercial Office Residential (COR), we request that the Planning Board "waive these standards to the extent it deems necessary in order to secure a reasonable development of the site. In such case, the applicant must establish that there are no practical alternatives to the proposed waiver that would conform to the standard". We list below the two waivers which apply to this site and provide the justification for the issuance of this waiver. We have differentiated between those standards which are identified as mandatory (i.e., must or shall) and requiring waivers and those that are recommended and identified as "should".

A. Site organization.
(1) Building placement.
(c) Maximum setback.
*[2} On a major road, the maximum setback **shall** be 25 feet.*

The Applicant believes that locating this building 25 feet from the street line of Troy Schenectady Road presents difficulties allowing no practical alternatives to the proposed waiver. The following factors create this condition:

Placing the building 25 feet back from Troy Schenectady Road rather than at the proposed building location would eliminate the capability of accessing the service reception area from the front of the building and reduce the capability of providing convenient customer parking in front of the building.

Therefore, the Applicant believes that granting the waiver for maximum setback is warranted.

(3) Off-street parking.

(a) `Off-street parking is encouraged to be at the rear of the building. Side of building parking is also permitted. New parking in the front yard shall be prohibited. Further, drive-through access aisles and stacking spaces shall be prohibited within the front yard.

Only 23 of the 192 parking spaces are located in the front yard. These include two handicapped and two Electrical Vehicle Charging stations. Locating parking for customers in front of the building is necessary to provide convenient and safe access.

Therefore, the Applicant believes that granting the waiver for off street parking in the front yard is warranted.

(d) For parking areas greater than 20 stalls, a minimum of 20 square feet of lands landscape island shall be included in the interior of the parking area for each stall. An island shall be considered to be in the interior of the parking area if at least 75% of its perimeter abuts the parking pavement.

Maximizing the availability of vehicle parking spaces for this facilities use is a factor in the success of this project. Since the majority of the parking is in the rear of the site and the intent of these spots are for vehicle storage and not to be visible by the general public (as would be the case for a parking lot for other uses), the visual impact of deleting the landscape island would be, in the opinion of the applicant, minimal. For the parking space in front of the building the landscaped island requirement is met.

Therefore, the Applicant believes that granting the waiver for no landscape islands for vehicle storage parking is warranted.

IMPACTS OF PROPOSED DEVELOPMENT

TRAFFIC

Existing access to the site is by one full service curb cut located along Mill Road. Proposed access will replace the existing curb cut. Mill Road in this location is posted as a speed limit of 30 MPH and estimated average speed of 38 MPH. The Applicant proposes to provide one right-in/right-out driveway on Troy Schenectady Road.

The following table defines estimated traffic movements for the proposed and existing use and quantifies each movement based upon Land Use Codes (source: Trip Generation 9th Edition as published by the Institute of Transportation Engineers). LUC 841 is for New Car Sales. Based upon a total of 24 employees, the estimated traffic movements are estimated below.

Land Use Code	Quantity	Average Total Trip Ends	Entering	Exiting
841	24	16	7	5

Existing AM Peak Hour of Generator

Land Use Code	Quantity	Average Total Trip Ends	Entering	Exiting
841	24	24	12	12

Existing PM Peak Hour of Generator

VISUAL

The Applicant intends to set the building back from the Troy-Schenectady Road a distance which varies from 62.93± feet to 124.62± feet which will allow a green area in front of the site and between the front of the building, parking lot and the pavement on Troy Schenectady Road. Views of the existing site is included in Appendix 1. Building elevations have been provided. The Applicant proposes to maintain existing trees where possible primarily along the northeast border of the property and provide quality landscaping at the site. The proposed landscaping will be in accordance with the design standards of Commercial Office Residential (COR) Zone.

COMMUNICATIONS

State of the art communication facilities will be provided to building. New utilities will be placed underground.

GAS & ELECTRIC

Electric lines and gas mains exist in the area. New electric utilities will be placed underground or through overhead wires as determined after discussions with National Grid.

SEWER

The Applicant proposes to construct a new sewer lateral, which is connected to the terminus manhole on the existing public sewer within the easement along Troy Schenectady Road. A dual tank grease and oil interceptor installation will be provided.

The total water use for project may be estimated based upon the commercial use and hydraulic loading. The estimated daily use using standards is approximately 600 GPD based upon 24 employees at 15 G/emloyee/D[3] as per New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, March 5, 2014 and 20 car washes at 12 G/car wash based upon data supplied by the equipment manufacturer.

Peak hourly flow can be estimated at 4.0 times the average daily flow per hour or 100 GPH or 0.004 CFS. The local sewer has adequate capacity to accommodate this increase.

WATER

The proposed area is located entirely inside the Latham Water District. The estimated daily use using standards is approximately 600 GPD based upon 24 employees at 15 G/emloyee/D[4] as per New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, March 5, 2014 and 20 car washes at 12 G/car wash based upon data supplied by the equipment manufacturer. In addition a landscape area sprinklers will be installed. When operating they would increase daily use by approximately 1,200 GPD.

FIRE PROTECTION

The proposed new building will be sprinklered. An existing hydrant is located on Mill Road near the proposed driveway. A flow test at this hydrant is recommended to be considered by the sprinkler system designer in sizing pipes.

[3] *Design Standards for Intermediate Sized Wastewater Treatment Systems, March 5, 2014.* NYSDEC, Page B-16
[4] *Ibid.* Page B-16

SOLID WASTE

The Town of Colonie recycles 14 materials so that any hauler disposing of wastes at the Town of Colonie Landfill will have to recycle those items. The estimated solid waste generated would result in approximately 0.4 tons of solid waste per month. This is based upon 1 pound of solid waste generated per day per employee per working day. A variation in weight and or volume of solid waste generated may occur based upon the treatment of recyclables if waste is disposed at other facilities.

DRAINAGE

The existing drainage pattern and discharge point will be retained. Attention will be paid to sedimentation, erosion control and the quality of storm water. A Storm Water Pollution Protection Plan (SWPPP) will be required under SPDES Permit #GP0-015-002. This site will be considered a redevelopment site and will provide stormwater quantity and quantity controls using a subsurface infiltration gallery and dry swales.. The standards in *Erosion and Sediment Control Guidelines for New Development* promulgated by New York State Department of Environmental Conservation will be met. A full SWPPP will be required since the site disturbance will be greater than 1 acre. Town Standards for Stormwater management plans and reports will be met.

HAZARDOUS MATERIALS

The storage and disposal method of chemicals to be used (solvents, soaps, etc) is as follows: Typical of any service shop; excess oil, soap, window shield washer fluid, etc will require disposal. They will be collected and stored in rated containers for the product and will be disposed of legally utilizing licensed haulers. The used oil will be burned .

NOISE

During construction, noise will be generated by construction equipment. All contracts will require that all work be accomplished at times and hours conducive to good neighborhood relationships. Once completed, these buildings will result little additional noise being generated which should not raise existing noise levels along Troy Schenectady Road substantially above ambient levels. No outdoor public address system will be utilized and doors to service bays will be closed except as necessary to allow cars to exit & enter.

DUST

During construction, dust will be limited utilizing dust suppression methods approved by the Town of Colonie. All contracts will require that all work be accomplished in a manner to significantly limit fugitive dust. Once completed this building or facilities will not result in the generation of any dust.

APPROVALS

The proposed project will require review by local, county and state agencies. A list of required approvals and submittals identified to date follows:

Town of Colonie Planning Board

SEQRA Review (if lead agency)

Site Plan Approval

(Various Departments must approve applications)

Town of Colonie Building Department

Building Permit

New York State Department of Transportation

Highway Work Permit

Albany Country Planning Board

§239 Submittal

CONCLUSION:

The proposed project will be designed to minimize the impact of items addressed herein. It is the engineer's conclusion that this project can be completed with minimum impact on the environment or on surrounding properties. This project will require a review pursuant to State Environmental Quality Review Act (SEQRA).

Prepared by: HERSHBERG & HERSHBERG
Daniel R. Hershberg, P.E. & L.S.

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Appendix 1
Site Photographs

View of main building from Intersection of Troy-Schenectady Road and Mill Road

View of main building from parking lot on Mill Road side

View of main building from parking lot on Mill Road side

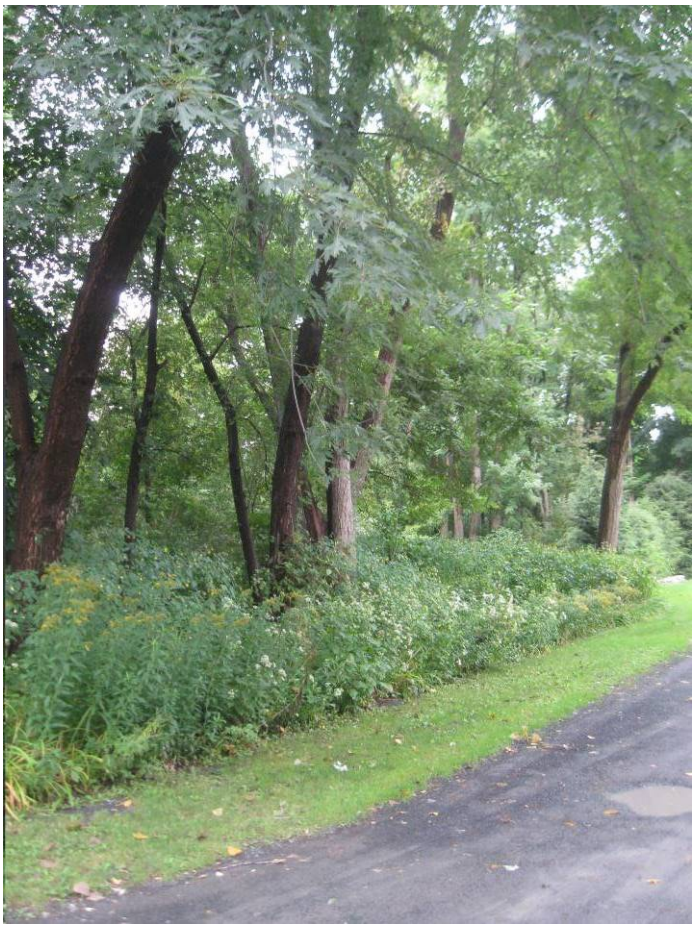
View of main building from Troy Schenectady Road

View of west side of main building

View of warehouse to become Parts Storage

View of existing driveway looking toward Mill Road

View of foliage along north side of property



View of foliage along north side of property

View of field looking west from Parking Lot

Appendix 2
Geotechnical Reports &
Infiltration Test Results

DENTE
ENGINEERING

ALBANY AREA
594 Broadway
Watervliet, NY 12189
Voice 518-266-0310
Fax 518-266-9238

BUFFALO AREA
PO Box 482
Orchard Park, NY 14127
Voice 716-649-9474
Fax 716-648-3521

March 28, 2017

Mr. Tom Restino
c/o Syvertsen Rigosu Architects, PLLC
Six Chelsea Place
Clifton Park, New York 12065

Re: Geotechnical Evaluation
Proposed Building
947 Troy-Schenectady Road
Colonie, NY
File No. FDE-17-32

Gentlemen:

Pursuant to your authorization, we have completed a geotechnical evaluation for the site which you intend to develop as an automobile dealership.

As a basis for this study we;

- Reviewed USGS, site, schematic maps and plans and discussed the same with your architect,
- Reviewed Geotechnical Evaluation Reports we have prepared for nearby sites,
- Completed 10 exploratory test borings,
- Completed 5 infiltration tests,
- Performed laboratory testing upon selected samples of the overburden soils collected through the site investigation.

Our understanding of the project was generated through discussions with you and the review of available plans and sketches. As the design of this project progresses and plans, grades, and loading criteria become finalized, we should be afforded an opportunity to review and evaluate the effects that any changes made during the design may have upon the recommendations presented in this report.

It should be understood that this report was prepared on the basis of the information supplied to us and the results of a limited number of explorations performed for the field investigation. The tests were advanced at specific locations and the overburden soils were observed and sampled at specific depths. It should be understood that conditions are only known at the locations and depths investigated. Because conditions at other locations and depths may be different and these differences may impact upon the conclusions reached and recommendations offered, we should be retained to provide construction period observations and consultations.

A sheet entitled "Important Information about your Geotechnical Engineering Report" prepared by the Geotechnical Business Council of the Geoprofessional Business Association is attached and should be reviewed, as it sets the only context within which this report should be used.

Please note that this report was prepared for informational purposes and should not be considered part of any future contract documents. Should the data contained in this report not be adequate for any particular contractor's purposes, that contractor should make their own investigations, tests, and analyses for their use in bidding and estimating the project.

SITE AND PROJECT DESCRIPTION

The site planned for construction is located north of the intersection of Mill Road and Troy Schenectady Road in the town of Colonie, New York. The site is depicted on the portion of the 7.5' USGS Topographic Map of the Niskayuna Quadrangle and a section of the 1898 USGS Map are presented in this report. The map is presented to assist the reader in locating the site, in reviewing the topography of the general areas in which it exists, and the changes in grades, if any, which have occurred during the mapping dates.

The site of the proposed development generally consists of unoccupied buildings surrounded with lawn, wooded areas, and an asphalt surfaced drive and parking lot. The site is partially occupied with two commercial slab on grade single story buildings. Grades about the buildings and along the roadways range between about 277 and 279 feet and slope down at an approximate inclination of 1 Vertical on 2 Horizontal along the western side of the property where a ravine traverses the site. A review of current and historic mapping suggest the ravine had much more gradual slopes at one time and occupied a more easterly portion of the site than it does currently. The building situated along the crest of the ravine has reportedly settled over its history although no records documenting magnitudes and rates exist.

We understand the existing main building will be demolished along with its subsurface utilities. A new automobile dealership is proposed for the site and will have a plan area of about 15,000sf. It is planned to be a single level, slab on grade at about elevation 278 feet, which will require slight fills to establish its pad grade. The structure is planned to have masonry walls and a steel frame. We have assumed the proposed building to have maximum column loads of as much as 200 kips and wall loading of about 6 kips/lineal foot. The majority of the area to be developed at the site will be

either paved, used as stormwater management areas, or occupied with the new or existing building (now positioned along the slope and to be re-purposed for automobile storage). The current site plan shows grades will be minimally changed from those which now exist.

As the design of the project progresses and actual loadings and site grading plans are developed, we should be retained to assess this site specific information relative to the recommendations contained herein and a final geotechnical evaluation be performed.

SUBSURFACE CONDITIONS

The subsurface conditions at the site were explored through the completion of 10 exploratory test borings at the approximate locations depicted on the Subsurface Investigation Plan attached. The borings were advanced using both CME 45 and CME 55 rotary drill rigs which employed hollow stem auger techniques to advance the bores. The overburden soils were sampled and their relative density determined through ordinary split spoon sampling techniques in general accord with ASTM D-1586 procedures.

Infiltration Tests were performed in the general areas and depths as requested following NYSDEC Recommended Practices. The results of these tests are attached.

Subsurface Logs are attached along with sheets that explain the terms used in their preparation. The Subsurface Logs should be reviewed for the specific conditions encountered at the investigated locations. It should be noted that conditions are only known at the investigated locations and at the depths sampled and that conditions at locations and depths other than those investigated may or may not be similar. It should also be understood that conditions may change with time and may be seasonally influenced.

The subsurface conditions disclosed through the investigations are considered typical to the project area.

The investigation of the site determined that fill was placed across the westerly portions of the site to form its current grades. The fills range from about nil to 14 feet in thickness. The fills consist of a mixture of moist sand, silt, gravel, and construction debris and rubble of a loose density.

Alluvial and lacustrine soils underlie the fills and extend through the depths explored, about 52 feet. These soils consist of inter-layered strata of; fine sand with lesser amounts of silt, silt with lesser amounts of fine sand, and varved silt and clay. These soils were of a generally loose relative density where granular and of a soft to medium consistency where cohesive, and varied from moist to wet to saturated.

No measurable groundwater was present within the augers at completion of drilling and sampling. This usually occurs when the augers penetrate silt and clay soils and seal off the granular layers. However, based on the presence of “wet” and “saturated” soils, it should be expected that groundwater will be found about 10 feet below grade.

Groundwater may also be found trapped in layers within the fills along the westerly side of the site and upon silt seams and layers within the indigenous soils.

GEOTECHNICAL RECOMMENDATIONS

Our investigation has determined that portions of the site planned for this development are mantled with between nil and 14 feet of uncontrolled fills which are unsuitable for support of spread foundations and floor slabs regardless of the loads imposed or building types planned. The uncontrolled fills which mantle the site must be removed entirely from beneath the proposed building and replaced in a controlled manner with structural fill to allow spread foundations to be used. Asphaltic concrete pavements may be planned for areas of the site underlain with the indigenous site soils and where fills are present. It should be understood however, that the filled areas may subside over time and the pavement planned above them may require maintenance and repairs on a more regular basis. Finally, the storm water infiltration and sedimentation basins as well as permeable pavements should not be planned for areas underlain with the existing fills. These fills will consolidate irregularly when waters are introduced to the subsurface where they exist and the consequential settlements may jeopardize the features, utilities, and pavements which overlie them.

SEISMIC CONSIDERATIONS

Site Classification: Our evaluation of the subsurface conditions at the site has been conducted following the Building Code of New York State (Code). We have evaluated the site conditions encountered and recommend that Seismic Site Class D be used in the design.

Liquefaction: Considering the composition and density of the soils encountered at this site, it is our opinion that there is no significant risk of liquefaction.

The USGS Design Maps Reports are attached.

GENERAL SITE PREPARATION

General site preparation should begin with the demolition of any remaining buildings existing in new building and pavement areas, removal of their utilities, and the stripping of asphalt, concrete, topsoil, and all fill soils from beneath the planned new buildings. The existing fill should be removed from beneath the proposed building and within a line extending out and down from their foundation edges at an inclination of 1 Vertical on 1 Horizontal. These excavations may vary in depth and require sloping, benching, and/or temporary lateral excavation support.

Temporary excavations at the site should be designed in accord with the provisions of OSHA standards found in 29 CFR 1926 for Type C soils. The excavations should be completed so as to not undermine the foundations of existing or newly constructed structures or utilities. In general, excavations should not encroach within the zone of influence for an existing foundation or utility defined by a line extending out and down from that foundation/utility at an inclination of 1 Vertical on 1.5 Horizontal. Excavations that encroach within this zone should be braced to support the soil and adjacent structural loads, or the foundation/utility should be underpinned as needed. Dewatering

with sump and pump methods should be performed as required to allow work to be completed in the dry.

Prior to placing fill into these excavated areas, the subgrade surface should be observed by the Geotechnical Engineer and, if he directs, be proof-compacted by completing at least five passes using a steel drum roller with a static weight of at least five tons. The roller should operate in its vibratory mode only when directed by the Geotechnical Engineer and travel at a speed of about three feet per second (two miles per hour). Soft areas which are identified during the subgrade compaction should be investigated to ascertain the cause and, where determined to be necessary by the observing Geotechnical Engineer, undercut and replaced with Structural Fill. The final subgrades should be sloped and routinely sealed with a roller, as required, to promote surface runoff away from the construction areas.

FILL AND BACKFILL

All fill used at the site to backfill excavations and increase grades for the support of buildings should consist of structural fill. Structural fill should consist of imported, sound, durable Sand and Gravel meeting the limits of gradation of the NYSDOT Section 304 for Type 1, 3 or 4 Material and be free of deleterious materials such as shale, organics, or contaminants of a chemical, mineral or biological nature. In general, we consider recycled concrete, asphalt, bricks, glass, and pyritic shale rock as unsuitable materials beneath the structure area and its associated pavements regardless of their gradation, unless specific and detailed environmental, chemical, and physical testing is completed to determine its suitability. Site soils, whether indigenous or fill, are considered unsuitable for use as structural fill beneath the building or pavements at this site.

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 no less than 95 percent of the maximum dry density for the soil established by the Modified Proctor Compaction Test, ASTM D1557.

RECOMMENDATIONS FOR SPREAD FOUNDATIONS

New spread foundations supporting the building may be designed to bear upon suitable indigenous site soils or Structural Fill placed following the complete removal of all existing fills and unsuitable soils as described above. Where Structural Fill is required, it should extend beyond the foundation edges in all directions a distance at least equal to the depth of the fill beneath the foundation.

Continuous wall and isolated column foundations may preliminarily be proportioned using an allowable net bearing pressure equal to 3,000 pounds per square foot. All wall and column foundations should have a minimum width of 24 and 30 inches, respectively. Foundations should bear at least four feet beneath final adjacent exterior grades to afford frost penetration protection. Foundations, in heated areas, may bear two feet beneath the interior floor slabs.

Provided that the foundation grades are prepared as recommended, the new foundations should settle in a semi-elastic manner as their loads are applied. The actual settlement of the structures will be related to the care exercised during the foundation grade preparations.

We estimate that total settlements for the heaviest loaded columns should be no more than about 1 inch with differential settlements of less than 3/4 inches between adjacent columns.

FLOOR SLABS

The building floor slabs should be provided with a minimum six inch thick base of clean crushed stone consisting of ASTM C33 Blend 57 material. A vapor retarder (Stego Wrap 15 mil Class A or equivalent) should be installed if floor coverings or moisture sensitive coatings are to be placed upon the slab. The vapor retarder should be positioned, i.e., above or below the stone base, in accord with the American Concrete Institute (ACI) Manual of Concrete Practice Manual Section 302.1R.

Assuming that the existing fills are removed and replaced as recommended, the floor slabs may be designed in accord with the recommended procedures of the ACI or Portland Cement Association using a vertical modulus of subgrade reaction equal to 200 pounds per cubic inch (pci) at the top of the recommended base layer.

PAVEMENTS

Assuming that the existing fills are left in place beneath the new pavements, the Owner must understand that long-term settlement of the pavements may occur and require periodic maintenance. The fill surfaces should be heavily proof compacted and stabilized, if required, as recommended previously.

Porous pavements and infiltration basins should not be positioned over areas underlain with uncontrolled fills. The fills will likely consolidate erratically and cause unacceptable settlements in the pavements, utilities, and structures which overlie them.

Assuming that the pavements are subject to automobile and occasional delivery truck type traffic, the pavement section materials and thicknesses tabulated below may be considered for use. All materials and construction should conform with the NYSDOT Standard Specifications for Construction and Materials. The base course materials should be compacted to 95 percent of the maximum dry density for the material established through the Modified Proctor Compaction Test, ASTM D1557.

FLEXIBLE ASPHALTIC CONCRETE PAVEMENT SECTIONS		
Course	**NYSDOT Reference**	**Layer Thickness**
Asphalt Top	Section 403 - Type 6	1.5"
Asphalt Binder	Section 403 - Type 3	2.5"
Crusher-Run Stone Base	Section 304 - Type 2	12"
Stabilization Fabric	Mirafi 500X or Equivalent	Single Ply

The recommended pavement section was designed for the traffic loads specified above, and not to support heavy construction equipment loads which may 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 equipment he intends to employ. Construction period traffic should not be routed across the recommended pavement sections.

It should be noted that all pavements require routine maintenance and occasional repairs. Failure to maintain the pavements or do repairs on a timely basis can materially shorten the pavement design life.

It should be understood that sidewalks and pavements constructed upon the site's soils will heave as frost seasonally penetrates the subgrades at this site. 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, the differential heave and settlements may result in undesirable movements that can create trip hazards. To limit the magnitude of heave and the creation of uneven joints to generally tolerable amounts for most winters, an 18-inch thick crushed stone base course composed of ASTM C33 Blend 57 stone may be placed beneath the sensitive sidewalk and drive or other areas. The stone must have an underdrain placed within it.

SUPPLEMENTAL INVESTIGATION

The existing building which is planned for re-purposing as parts storage should be evaluated by the project's structural engineer as it is known to have settled in its past, which may have affected its structural elements.

New loads upon the structure or its slab as well as changes to the site's drainage patterns may cause the fills beneath this structure to begin consolidating again. If changes in loads or grades are contemplated for this structure, we should review the changes planned and perform supplemental borings about it to enable us to ascertain whether underpinning or stabilization may be warranted.

CONSTRUCTION MONITORING & PLAN REVIEW

It should be understood that the actual subsurface conditions that exist across this site will only be known when the site is excavated. Dente Engineering should be retained to monitor earthwork and bearing grade preparations for foundations, floor slabs, and pavements to validate 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.

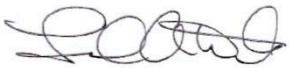
Dente Engineering should also be retained to review plans and specifications related to foundations and earthwork prior to their release for bidding to confirm that the recommendations contained herein were properly interpreted and applied.

CLOSURE

This report was prepared using generally accepted practices common to geotechnical engineering in the area and at the time of its preparation. No other warranty, expressed or implied, is made. This report was prepared on the basis of the information supplied to us and a limited number of explorations, and it is intended for specific application to the project and the site as discussed herein. Conditions often change between locations and with time and for these as well as other reasons discussed elsewhere, we should be retained to provide geotechnical evaluation of the site design as it progresses.

We appreciate the opportunity to be of service. Should questions arise concerning this report or the project, please contact us at your convenience.

Sincerely,
Dente Engineering, P.C.



Fred Dente, P.E.
President

Attachments;

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.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in 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.

Geotechnical-Engineering 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 given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives 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 this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- 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. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include 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.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering 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 subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

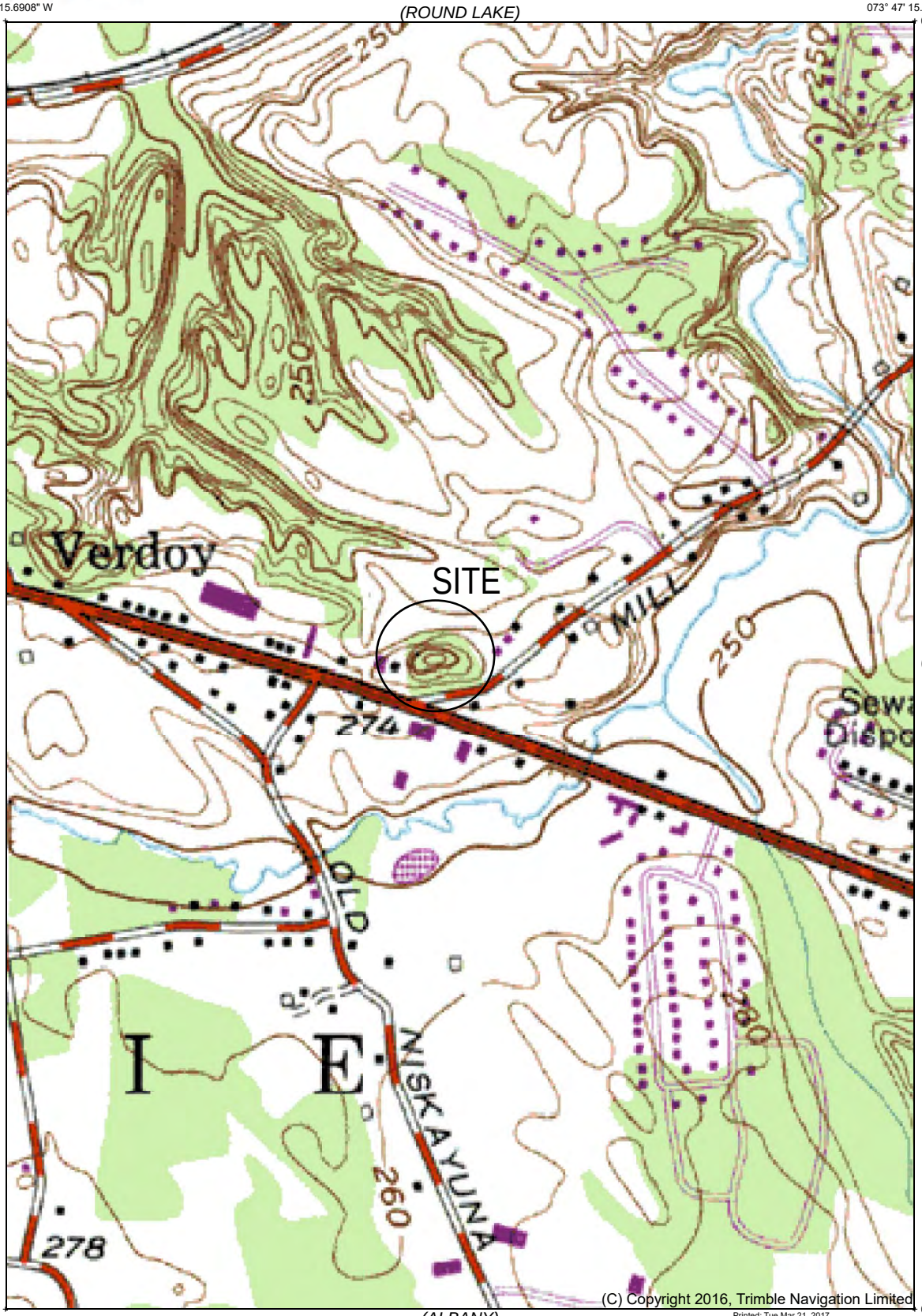
Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

NISKAYUNA QUADRANGLE
NEW YORK
TOPOGRAPHIC SERIES

(BURNT HILLS) (ROUND LAKE) (MECHANICVILLE)

073° 48' 15.6908" W
042° 46' 18.9195" N

073° 47' 15.0767" W
042° 46' 18.9195" N



(SCHENECTADY) (TROY NORTH)

042° 45' 15.8792" N
073° 48' 15.6908" W

Printed: Tue Mar 21, 2017

042° 45' 15.8792" N
073° 47' 15.0767" W

(ALBANY)

(VOORHEESVILLE) (TROY SOUTH)

SCALE 1:9028

Declination
MN GN
GN 0.81° E
MN 13.56° W

0.0 0.1 0.2 0.3
Miles
0 100 200 300 400 500 600
Yards
0.0 0.1 0.2 0.3 0.4 0.5 0.6
Kilometers

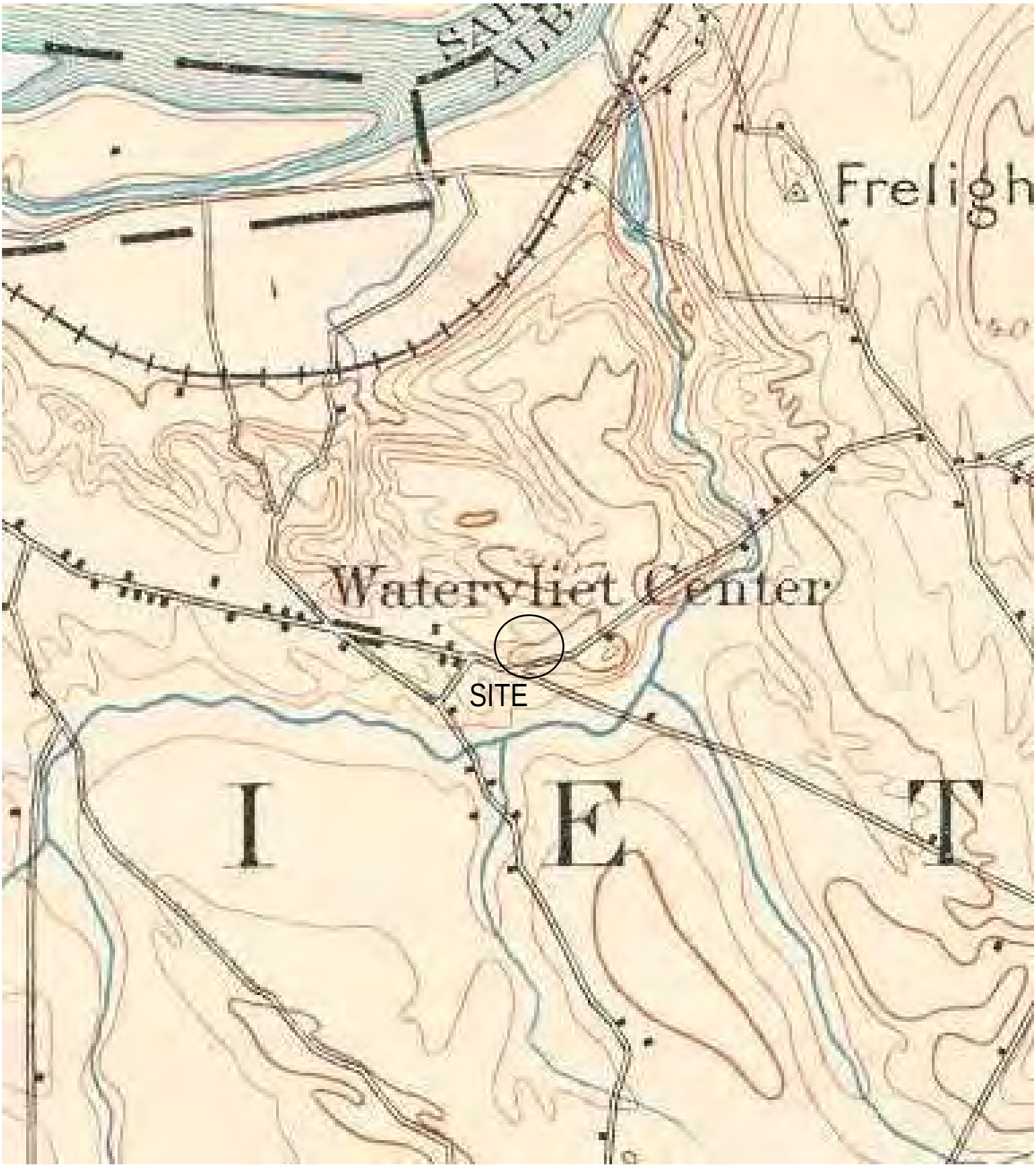
CONTOUR INTERVAL 10 FT

Produced by Trimble Terrain Navigator Pro
Topography based on USGS 1:24,000 Maps

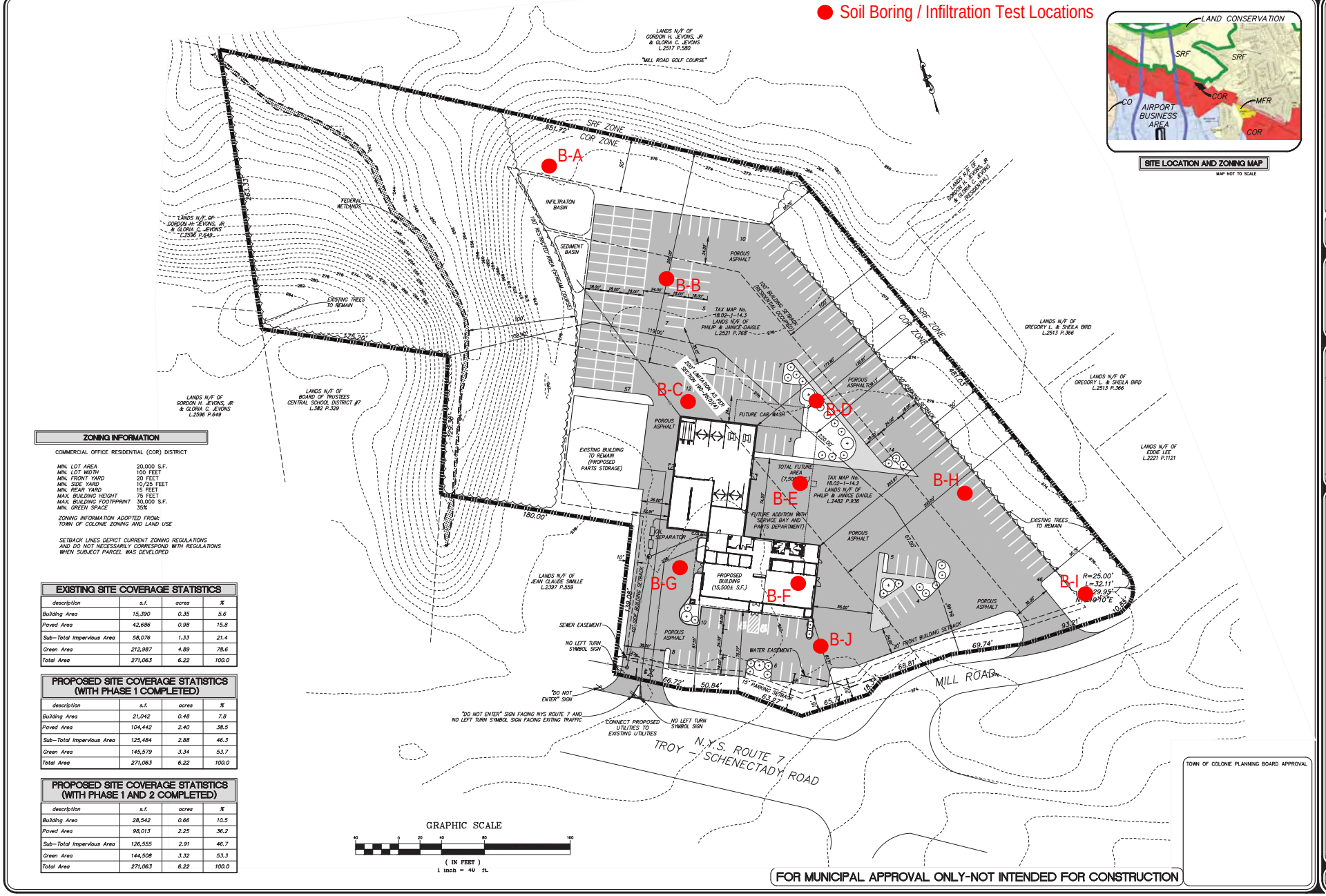
North American 1983 Datum (NAD83)

To place on the predicted North American 1927 move the projection lines 9M N and 35M E

42073-G6-TM-024
NISKAYUNA, NY
JAN 1, 1980



947 Troy Schenectady Road & 2 Mill Road, Colonie, New York 1898



EXISTING SITE COVERAGE STATISTICS

description	s.f.	acres	%
Building Area	15,390	0.35	5.6
Paved Area	42,686	0.98	15.8
Sub-Total Impervious Area	58,076	1.33	21.4
Green Area	212,987	4.89	78.6
Total Area	271,063	6.22	100.0

PROPOSED SITE COVERAGE STATISTICS (WITH PHASE 1 COMPLETED)

description	s.f.	acres	%
Building Area	21,042	0.48	7.8
Paved Area	104,442	2.40	38.5
Sub-Total Impervious Area	125,484	2.88	46.3
Green Area	145,579	3.34	53.7
Total Area	271,063	6.22	100.0

PROPOSED SITE COVERAGE STATISTICS (WITH PHASE 1 AND 2 COMPLETED)

description	s.f.	acres	%
Building Area	28,542	0.66	10.5
Paved Area	98,013	2.25	36.2
Sub-Total Impervious Area	126,555	2.91	46.7
Green Area	144,508	3.32	53.3
Total Area	271,063	6.22	100.0

HERSHBERG & HERSHBERG
Consulting Engineers and Land Surveyors
18 Locust Street
Albany, New York 12203

STATE OF NEW YORK — DANIEL R. HERSHBERG — 044228 — PROFESSIONAL ENGINEER & LAND SURVEYOR

REVISIONS	DATE
ADDED DIMENSIONS, USE	3-7-2017
ADDED DIMENSIONS, USE	3-15-2017

PROPOSED PRELIMINARY SITE PLAN FOR PROPOSED AUTO DEALERSHIP, 947 TROY SCHENECTADY ROAD, TOWN OF COLONIE, NEW YORK

APPLICANT: DEPAULA CHEVROLET

FILE: 170046 | SCALE: 1"=40' | BY: MLR | CHK: DRH | DATE: 2/28/17 | 170046-LDWG

ZF1

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 ENGINEERING, P.C.	SUBSURFACE LOG B-A

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/13/17	FINISH: 3/13/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 276.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	1	4	5				**FILL**: Dark Brown SILT and CLAY, Some
				5	5	10	F-C Sand and Gravel (MOIST)
	2	5	5				Grades Brown Mottled F-C SAND, Some
				3	2	8	Silt and Gravel, Little Clay and Asphalt
	3	1	2				Grades Some Asphalt
5'				5	8	7	
	4	4	4				Grades Little Silt
				2	1	6	
	5	2	1				Grades Brown Fine SAND, Some Asphalt,
				1	2	2	Little Silt (WET), Grades to Brown F-C
10'	6	1	9				SAND and SILT, Some Concrete, trace
				15	13	24	asphalt (MOIST), Grades to Brown/Gray
	7	14	6				F-C SAND and SILT, Some Asphalt, Little
				18	8	24	Gravel (WET)
	8	1	1				**(MOIST & WET, MEDIUM, LOOSE TO FIRM)**
15'				1	2	2	Dark Brown/Brown Mottled SILT, Little Clay,
	9	5	4				rootlets notedd (MOIST), Grades Brown
				4	5	8	Mottled, Little Fine Sand (WET)
	10	1	2				Grades Brown Mottled SILT, Some Fine
				2	3	4	Sand (SATURATED)
20'	11	2	2				
				2	2	4	
							(MOIST TO SATURATED, LOOSE)
25'	12	2	2				Brown Varved SILT and CLAY (MOIST)
				3	5	5	
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-A contin.

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/13/17	FINISH: 3/13/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 276.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	13	1	2				Gray SILT and CLAY with Occasional Fine Sand Partings (WET)
				3	3	5	
35'	14	1	2				
				2	6	4	**(MOIST TO WET, SOFT)**
40'	15	WH	1				Gray SILT, Some Fine Sand, Little Clay (SATURATED)
				2	2	3	
45'	16	1	3				
				4	4	7	**(SATURATED, LOOSE)**
50'	17	1	4				Gray SILT and CLAY with Silt Seams and Fine Sand Partings
				3	4	7	**(SATURATED, MEDIUM)**
55'							End of boring 52.0' depth.
60'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-B

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/13/17	FINISH: 3/13/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 277.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 1" Topsoil
	1	2	4				**FILL**: Brown F-C SAND, SILT, and GRAVEL (MOIST)
				14	14	18	
	2	16	18				Grades Little Asphalt
				20	20	38	
	3	12	8				Grades Little Concrete and Gravel, Grades to (WET)
5'				8	8	16	
	4	50/.3'				50+	**(MOIST TO WET, FIRM AND COMPACT)**
							End of boring 6.3' depth with split spoon refusal.
10'							
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-C

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/13/17	FINISH: 3/13/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 277.5'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 2" Crushed Stone
	1	6	4				**POSSIBLE FILL**: Brown Fine SAND, trace silt (MOIST)
				4	4	8	
	2	3	2				
				3	2	5	**(MOIST, LOOSE)**
	3	1	2				Brown Fine SAND, trace silt and dark brown mottling
5'				4	4	6	
	4	5	8				Grades Brown Fine SAND, Little Silt
				8	12	16	
10'	5	4	3				
				2	2	5	
15'	6	2	2				
				1	2	3	**(MOIST, LOOSE AND FIRM)**
							End of boring 17.0' depth.
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-D

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/16/17	FINISH: 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 277.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 2" Topsoil
	1	WH	1				Brown Fine SAND, trace silt (MOIST)
				2	1	3	
	2	1	1/12"				Similar with rootlets noted
				-	1	1	
	3	1	1				Grades Brown/Orange Mottled, Some Silt
5'				1	1	2	
	4	3	3				Similar with trace gray mottling
				3	5	6	
							(MOIST, LOOSE)
10'	5	2	1				Brown SILT and CLAY
				2	2	3	
							(WET, VERY SOFT)
15'	6	2	2				Brown SILT, Little Clay
				2	2	4	**(WET, LOOSE)**
							End of boring 17.0' depth.
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-E

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/16/17	FINISH: 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 278.0'
DRILL TYPE: CME 55	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 6" Sand and Crushed Stone
	1		20				
				16	14		Brown Fine SAND, Little Silt
		10				30	**(MOIST, FIRM)**
							Brown Varved SILT and CLAY with Bands
	2	4	7				of Fine Sand noted
5'				9	11	16	**(MOIST, STIFF)**
	3	11	10				Brown Fine SAND with Occasional Silt
				10	8	20	Partings **(MOIST, FIRM)**
							End of boring 8.0' depth.
10'							
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-F

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/16/17	FINISH: 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 278.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 2" Asphalt, +/- 3" Base
	1	4	5				Brown Fine SAND, trace silt
				4	4	9	**(MOIST, LOOSE)**
	2	4	4				Brown SILT and CLAY with Occasional Fine
				4	3	8	Sand Partings
5'	3	3	5				Similar with Fine Sand and Silt Seams
				9	10	14	**(MOIST, MEDIUM)**
	4	12	10				Brown Fine SAND and SILT with Silt
				10	12	20	Partings
							(MOIST, FIRM)
10'	5	3	5				Brown SILT, Some Fine Sand
				3	3	8	
							(SATURATED, LOOSE)
15'	6	1	2				Gray SILT and CLAY
				2	2	4	
20'	7	WH	1				Similar with Fine Sand and Silt Bands
				1	1	2	
25'	8	1	1				
				1	2	2	
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-F contin.

PROJECT: 947 Troy Schenectady Road	**DATE**	**START:** 3/16/17	**FINISH:** 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 278.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	
	9	1	2				Gray SILT and CLAY
				2	3	4	
35'	10	WH	1				
				2	2	3	
40'	11	WH	1				Similar with Fine Sand and Silt Partings
				1	2	2	
							(SATURATED, SOFT AND VERY SOFT)
45'	12	1	2				Gray Fine SAND and SILT
				4	4	6	
50'	13	1	4				Similar with Clay Bands
				4	4	8	**(SATURATED, LOOSE)**
							End of boring 52.0' depth.
55'							
60'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-G

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/13/17	FINISH: 3/13/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 278.0'
DRILL TYPE: CME 45C	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 6" Crushed Stone
	1	23	15				**FILL**: Brown Mottled F-C SAND, Little Silt
				10	7	25	**(MOIST, FIRM)**
	2	4	4				Brown Fine SAND, trace silt **(MOIST, FIRM)**
				5	5	9	Brown SILT and CLAY **(MOIST, MEDIUM)**
	3	3	3				Brown Fine SAND, Little Silt
5'				5	5	8	
	4	8	7				
				8	8	15	
							(MOIST, LOOSE TO FIRM)
10'							
	5	4	4				Brown Fine SAND and SILT
				2	5	6	
							(SATURATED, LOOSE)
15'							
	6	3	3				Brown to Gray SILT and CLAY
				3	3	6	**(WET, MEDIUM)**
							End of boring 17.0' depth.
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-H

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/16/17	FINISH: 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 277.0'
DRILL TYPE: CME 55	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 3" Topsoil
	1	1	2				Brown Fine SAND, Little Silt (MOIST)
				2	2	4	
	2	3	3				Grades trace silt
5'				3	4	6	
	3	4	4				
				5	6	9	**(MOIST, LOOSE)**
							End of boring 8.0' depth.
10'							
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-I

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/16/17	FINISH: 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 278.0'
DRILL TYPE: CME 55	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 2" Topsoil
	1	WH	1				Brown Fine SAND, Little Silt (MOIST)
				2	3	3	
	2	5	6				
5'				6	9	12	
	3	7	8				
				8	8	16	**(MOIST, LOOSE TO FIRM)**
							End of boring 8.0' depth.
10'							
15'							
20'							
25'							
30'							

DENTE ENGINEERING, P.C.	SUBSURFACE LOG B-J

PROJECT: 947 Troy Schenectady Road	**DATE**	START: 3/16/17	FINISH: 3/16/17

LOCATION: Colonie, New York	**METHODS:** 3 1/4" Hollow Stem Augers, ASTM
CLIENT: Tom Restino	D1586 Drilling Methods with Auto Hammer
JOB NUMBER: FDE-17-32	**SURFACE ELEVATION:** +/- 277.0'
DRILL TYPE: CME 55	**CLASSIFICATION:** O.Burns

SAMPLE		BLOWS ON SAMPLER					CLASSIFICATION / OBSERVATIONS
DEPTH	#	6"	12"	18"	24"	N	+/- 3" Topsoil
	1	1	2				**FILL**: Brown Mottled Fine SAND, trace silt
				3	3	5	**(MOIST, LOOSE)**
							Brown SILT and CLAY
							(MOIST, SOFT TO MEDIUM)
	2	4	6				
5'				9	11	15	Brown SILT, Little Fine Sand **(MOIST, FIRM)**
	3	8	8				Brown Fine SAND, trace silt, Grades to
				8	10	16	Some Silt **(MOIST, FIRM)**
							End of boring 8.0' depth.
10'							
15'							
20'							
25'							
30'							

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INFILTRATION TEST RESULTS

PROJECT: 947 Troy Schenectady Road | **PROJECT NO.** FDE-17-32

PROJECT LOCATION: Colonie, New York | **TEST DATE:** 3/23/17

WEATHER: | **TESTER:** M. McHenry

Test Location	Test Depth (feet)	Trial No.	Water Drop (inches)	Elapsed Time (hours)	Infiltration Rate (inches/hour)
B-B	2.8	1	0.0	1.00	0.0
		2	0.25	1.00	0.25
		3	0.25	1.00	0.25
		4	0.25	1.00	0.25
		Presoak water was present prior to testing. Average infiltration rate for four trials was 0.2 inches per hour. Infiltration rate of final trial was 0.25 inches per hour.			
B-E	3.1	1	0.0	1.00	0.0
		2	0.0	1.00	0.0
		3	0.0	1.00	0.0
		4	0.0	1.00	0.0
		Presoak water was present prior to testing. Water did not infiltration within a four hour period, and as such, the infiltration test is considered failed.			

Notes:

(1) Testing was conducted in general accord with the “Infiltration Testing Requirements” contained in Appendix D of the New York State Storm Water Management Design Manual.

(2) Test pipes were installed in boreholes made adjacent to test borings B-B and B-E.

SOIL CLASSIFICATION AT TEST DEPTH

Test Location B-B: FILL: Brown F-C SAND, SILT, and GRAVEL, Little Asphalt

Test Location B-E: Brown Varved SILT and CLAY with Bands of Fine Sand noted

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INFILTRATION TEST RESULTS

PROJECT: 947 Troy Schenectady Road | **PROJECT NO.** FDE-17-32

PROJECT LOCATION: Colonie, New York | **TEST DATE:** 3/23/17

WEATHER: | **TESTER:** S. Loiselle / S. Morey

Test Location	Test Depth (feet)	Trial No.	Water Drop (inches)	Elapsed Time (hours)	Infiltration Rate (inches/hour)
B-H	3.4	1	14.4	1.00	14.4
		2	14.8	1.00	14.8
		3	15.3	1.00	15.3
		4	16.8	1.00	16.8
		No presoak water was left in pipe at beginning of test. Average infiltration rate for four trials was 15.3 inches per hour. Infiltration rate of final trial was 16.8 inches per hour.			
B-I	3.4	1	19.2	1.00	19.2
		2	18.5	1.00	18.5
		3	17.8	1.00	17.8
		4	19.3	1.00	19.3
		No presoak water was left in pipe at beginning of test. Average infiltration rate for four trials was 18.7 inches per hour. Infiltration rate of final trial was 19.3 inches per hour.			

Notes:

(1) Testing was conducted in general accord with the "Infiltration Testing Requirements" contained in Appendix D of the New York State Storm Water Management Design Manual.

(2) Test pipes were installed in boreholes made adjacent to test borings B-H and B-I.

SOIL CLASSIFICATION AT TEST DEPTH

Test Location B-H: Brown Fine SAND, Little Silt

Test Location B-I: Brown Fine SAND, Little Silt

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INFILTRATION TEST RESULTS

PROJECT: 947 Troy Schenectady Road	**PROJECT NO.** FDE-17-32
PROJECT LOCATION: Colonie, New York	**TEST DATE:** 3/23/17
WEATHER:	**TESTER:** S. Loiselle / S. Morey

Test Location	Test Depth (feet)	Trial No.	Water Drop (inches)	Elapsed Time (hours)	Infiltration Rate (inches/hour)
B-J	3.6	1	1.8	1.00	1.8
		2	1.3	1.00	1.3
		3	1.8	1.00	1.8
		4	1.3	1.00	1.3
		No presoak water was left in pipe at beginning of test. Average infiltration rate for four trials was 1.6 inches per hour. Infiltration rate of final trial was 1.3 inches per hour.			

Notes:

(1) Testing was conducted in general accord with the “Infiltration Testing Requirements” contained in Appendix D of the New York State Storm Water Management Design Manual.

(2) Test pipe was installed in a borehole made adjacent to test boring B-J.

SOIL CLASSIFICATION AT TEST DEPTH

Test Location B-J: Brown SILT and CLAY

947 Troy Schenectady Rd

Colonie, NY

Moisture Content Results - ASTM D2216

Boring No.	B-A / S-8	B-A / S-9	B-A / S-10	B-A / S-11	B-F / S-3	B-F / S-4
Sample No.	549	550	551	552	553	554
Sample Depth	14'-16'	16'-18'	18'-20'	20'-22'	5'-7'	7'-9'
Tare Weight	262.00	260.50	260.70	257.90	254.90	258.40
W_S + Tare	525.90	550.30	556.00	531.00	482.20	510.20
W_D + Tare	475.10	491.90	487.80	467.00	439.30	483.10
W_{WATER}	50.80	58.40	68.20	64.00	42.90	27.10
$W_{DRY\ SOIL}$	213.10	231.40	227.10	209.10	184.40	224.70
% Moisture (W_W / W_D)	23.8	25.2	30.0	30.6	23.3	12.1

Boring No.	B-F / S-5	B-F / S-6	B-F / S-7	B-F / S-8		
Sample No.	555	556	557	558		
Sample Depth	10'-12'	15'-17'	20'-22'	25'-27'		
Tare Weight	258.40	256.50	257.20	257.20		
W_S + Tare	568.10	594.40	573.80	520.20		
W_D + Tare	495.60	523.20	507.00	456.40		
W_{WATER}	72.50	71.20	66.80	63.80		
$W_{DRY\ SOIL}$	237.20	266.70	249.80	199.20		
% Moisture (W_W / W_D)	30.6	26.7	26.7	32.0		

Boring No.						
Sample No.						
Sample Depth						
Tare Weight						
W_S + Tare						
W_D + Tare						
W_{WATER}						
$W_{DRY\ SOIL}$						
% Moisture (W_W / W_D)						

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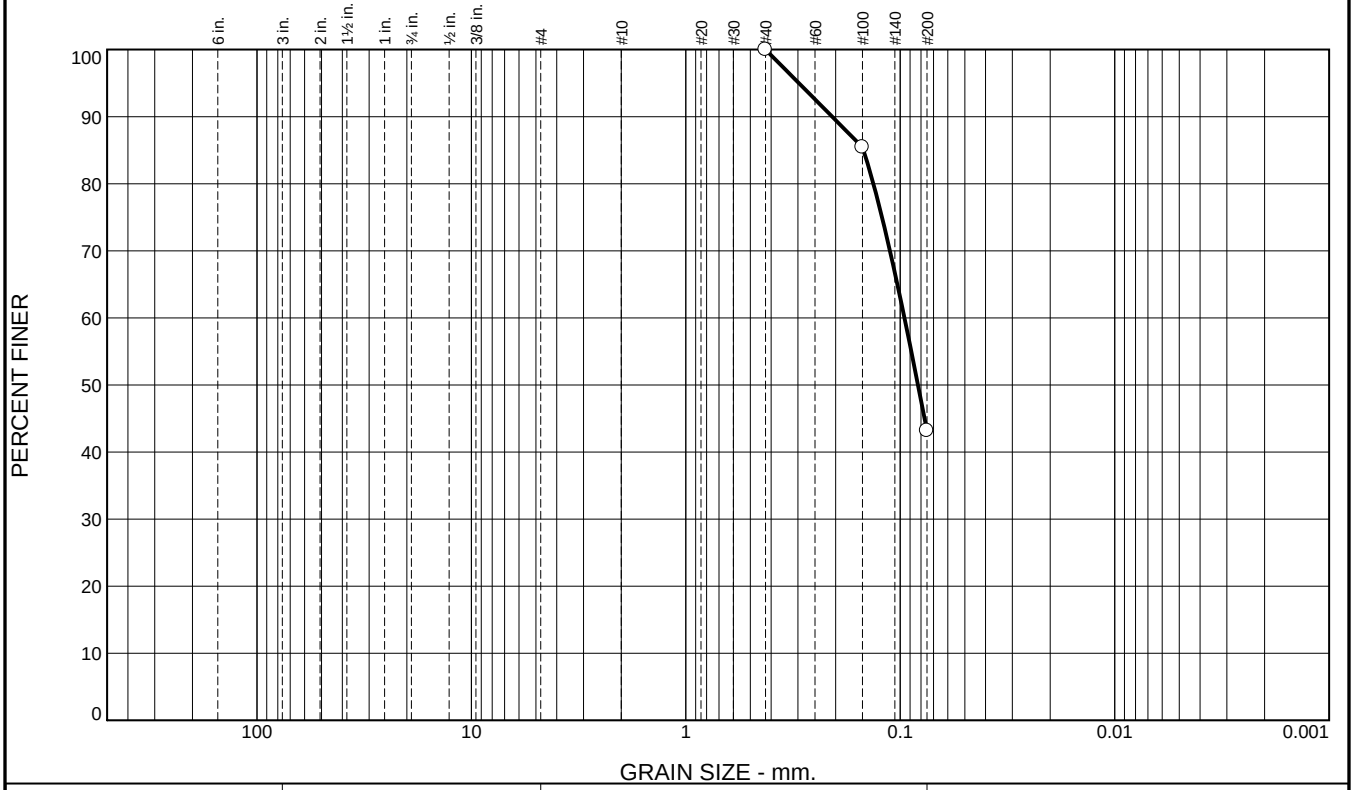
Client: Tom Restino
File No. FDE-17-032
Date: March 22, 2017

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	56.8	43.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#40	100.0		
#100	85.4		
#200	43.2		

* (no specification provided)

Material Description

FINE SAND and SILT

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 0.2078 D_{85}= 0.1484 D_{60}= 0.0956
D_{50}= 0.0827 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Per ASTM D422 Washed

Source of Sample: Soil Borings **Depth:** 7'-9'
Sample Number: 554 B-F / S-4

Date: 3-22-17

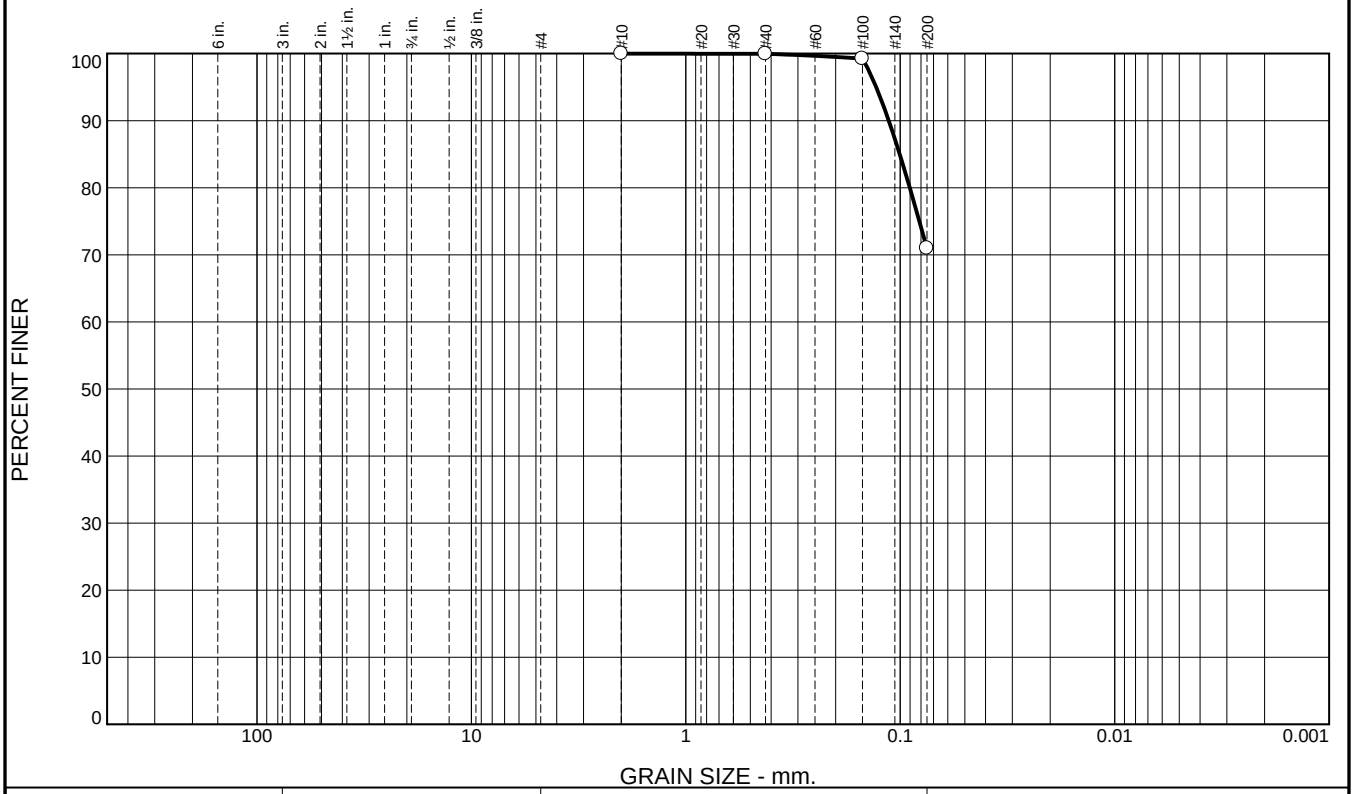
EVERGREEN TESTING, INC.
Watervliet, NY

Client: Tom Restino
Project: 947 Troy Schenectady Rd
Colonie, NY
Project No: FDE-17-032

Figure 554

Tested By: AB **Checked By:** FD

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	29.0	71.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	100.0		
#100	99.2		
#200	71.0		

* (no specification provided)

Material Description

SILT, Some Fine Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{90}= 0.1131 D_{85}= 0.1006 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO= A-4(0)

Remarks

Per ASTM D422 Washed

Source of Sample: Soil Borings **Depth:** 10'-12'
Sample Number: 555 B-F / S-5

Date: 3-22-17

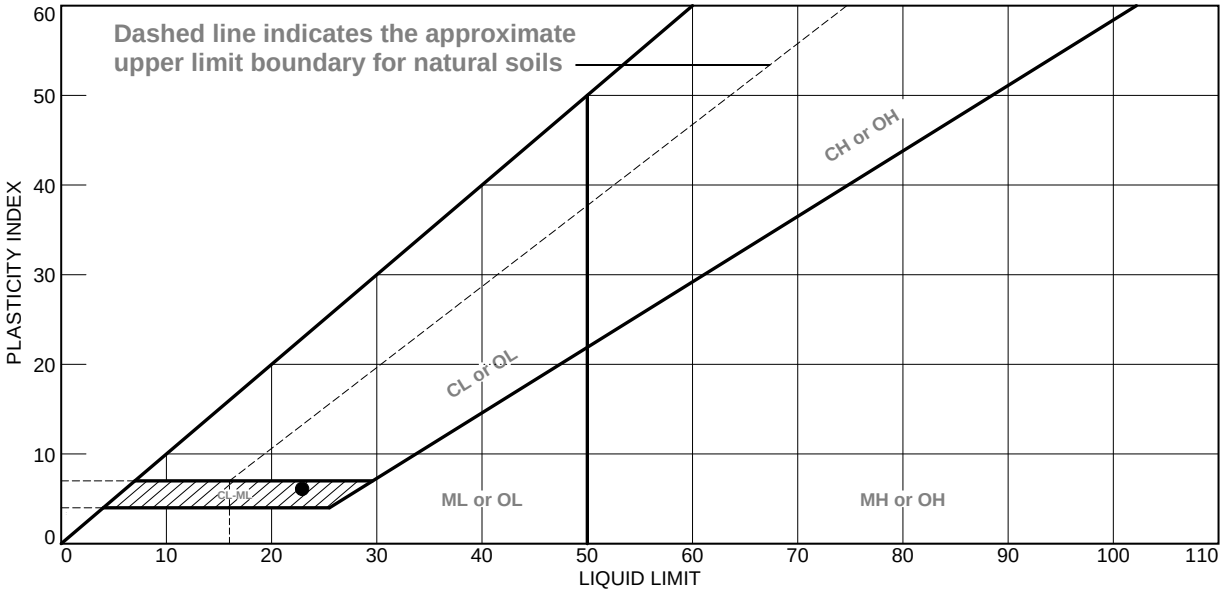
EVERGREEN TESTING, INC.
Watervliet, NY

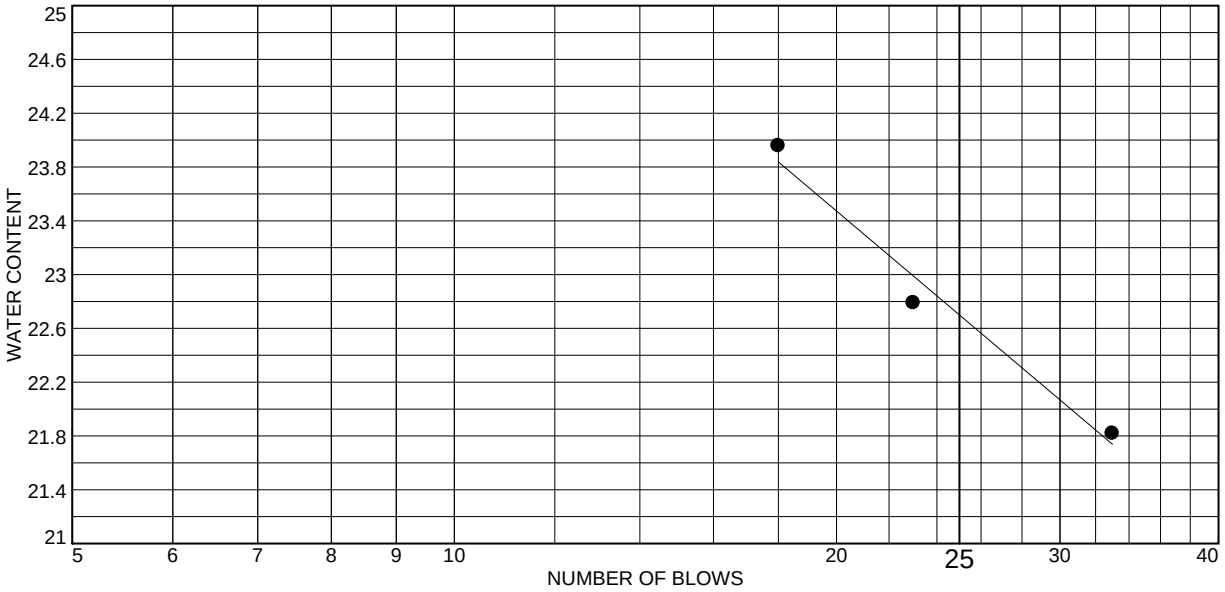
Client: Tom Restino
Project: 947 Troy Schenectady Rd
Colonie, NY
Project No: FDE-17-032

Figure 555

Tested By: AB **Checked By:** FD

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean silt and clay	23	17	6			

Project No. FDE-17-032 **Client:** Tom Restino

Project: 947 Troy Schenectady Rd
Colonie, NY

Source of Sample: Soil Borings **Depth:** 15'-17'

Sample Number: 556 B-F / S-6

EVERGREEN TESTING, INC.

Watervliet, NY

Remarks:

●Per ASTM D4318 Atterberg Limits

Figure 556

Tested By: AB **Checked By:** FD

USGS Design Maps Summary Report

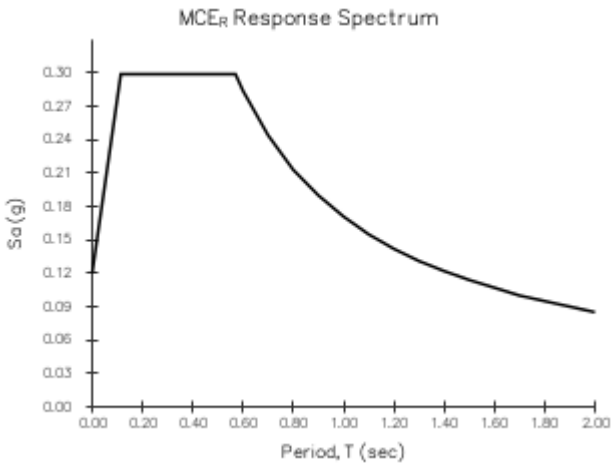
User–Specified Input

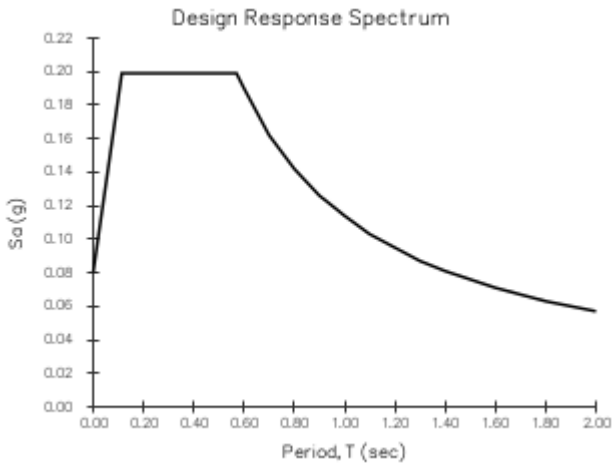
Report Title	947 Troy Schenectady Road Mon March 27, 2017 18:58:20 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	42.7628°N, 73.79716°W
Site Soil Classification	Site Class D – “Stiff Soil”
Risk Category	I/II/III

USGS–Provided Output

S_S =	0.187 g	S_{MS} =	0.299 g	S_{DS} =	0.199 g
S_1 =	0.071 g	S_{M1} =	0.171 g	S_{D1} =	0.114 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.





USGS Design Maps Detailed Report

2012/2015 International Building Code (42.7628°N, 73.79716°W)

Site Class D – “Stiff Soil”, Risk Category I/II/III

Section 1613.3.1 — Mapped acceleration parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2012/2015 International Building Code are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 1613.3.3.

From Figure 1613.3.1(1) [1] S_S = 0.187 g

From Figure 1613.3.1(2) [2] S_1 = 0.071 g

Section 1613.3.2 — Site class definitions

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Section 1613.

2010 ASCE-7 Standard – Table 20.3-1
SITE CLASS DEFINITIONS

Site Class	$\overline{v}_s$	$\overline{N}$ or $\overline{N}_{ch}$	$\overline{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content w ≥ 40%, and • Undrained shear strength $\overline{s}_u$ < 500 psf		

F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 1613.3.3 — Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters

TABLE 1613.3.3(1)
VALUES OF SITE COEFFICIENT F_a

Site Class	Mapped Spectral Response Acceleration at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 0.187 g, F_a = 1.600

TABLE 1613.3.3(2)
VALUES OF SITE COEFFICIENT F_v

Site Class	Mapped Spectral Response Acceleration at 1–s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.071 g, F_v = 2.400

Equation (16-37): $S_{MS} = F_a S_S = 1.600 \times 0.187 = 0.299$ g

Equation (16-38): $S_{M1} = F_v S_1 = 2.400 \times 0.071 = 0.171$ g

Section 1613.3.4 — Design spectral response acceleration parameters

Equation (16-39): $S_{DS} = ⅔ S_{MS} = ⅔ \times 0.299 = 0.199$ g

Equation (16-40): $S_{D1} = ⅔ S_{M1} = ⅔ \times 0.171 = 0.114$ g

Section 1613.3.5 — Determination of seismic design category

TABLE 1613.3.5(1)
SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD (0.2 second) RESPONSE ACCELERATION

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 0.199 g, Seismic Design Category = B

TABLE 1613.3.5(2)
SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.114 g, Seismic Design Category = B

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ “the more severe design category in accordance with Table 1613.3.5(1) or 1613.3.5(2)” = B

Note: See Section 1613.3.5.1 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 1613.3.1(1)*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(1).pdf

2. *Figure 1613.3.1(2)*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/IBC-2012-Fig1613p3p1(2).pdf