

Construction Soil Management Plan

Amherst Central Park South - Phase 1

DEC Site No. 915291

772 North Forest Road

Town of Amherst, Erie County, New York

“P Order” (Index No. R9-20240227-28)

Prepared for:

Town of Amherst

5583 Main Street

Williamsville, New York 14202

June 2024

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Acronym List

ASP	Analytical Services Protocol
BCP	Brownfield Cleanup Program
BGS	Below Ground Surface
CIS-1,2-DCE	Cis-1,2-dichloroethene
CVOC	Chlorinated Volatile Organic Compound
ELAP	Environmental Laboratory Accreditation Program
ESA	Environmental Site Assessment
HASP	Health and Safety Plan
MSL	Mean Sea Level
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	Polycyclic Aromatic Hydrocarbons
PPM	Parts per Million
PCB	Polychlorinated Biphenyl
PID	Photo-ionization Detector
PCE	Tetrachloroethylene
PVC	Poly Vinyl Chloride
QA/QC	Quality Assurance / Quality Control
REC	Recognized Environmental Condition
SCG	Standards, Criteria, Guidance
SCO	Soil Cleanup Objective
SITE	Amherst Central Park South
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TOGS	Technical and Operational Guidance Series
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Service
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1 INTRODUCTION

C&S Engineers, Inc. (C&S) has prepared this Soil Management Plan (SMP) for the Amherst Central Park South Site Phase 1 located within 772 North Forest Road, Amherst, Erie County, New York (the "Site"). **Figure 1** shows the location of the Site.

A Construction Characterization Work Plan (CCWP) was approved on December 22, 2023 and the investigation commenced on December 27 and 29, 2023, February 8 and 21, 2024, and March 14, 2024.

The investigation was conducted to characterize soil conditions prior to the commencement of construction activities and provide analytical data to create a soil handling plan for the site construction activities. The investigation consisted of:

- The collection and analysis of one sediment sample
- The advancement of 44 soil borings and collection and analysis of 91 subsurface soil samples

Soil and sediment samples were analyzed for a combination of Target Analyte List (TAL) metals, mercury, cyanide, and hexavalent chromium.

This CSMP was developed to 1) provide guidance on the management of onsite soil during Phase 1 construction, 2) provide an excavation work plan for one well-defined area of contamination at the Site identified during the investigation, and 3) to describe proposed actions to address the contamination.

This CSMP was developed for Phase 1 of the project. Phase 1 of Amherst Central Park South redevelopment plans includes the construction of a Community Theatre, Winter Market, and Skating Area. The work also consists of enhancing and creating related parking, roadways, and upgrading needed utilities.

2 PROJECT BACKGROUND

2.1 Site Description

In April 2023, the Town of Amherst purchased the former Westwood Country Club 170-acre property (“Property”) located at 772 North Forest Road, Amherst, New York. **Figure 1** shows the location of the Property (former Westwood County Club). The Town intends to transform the Property into a new public park. The park will be developed in stages. The first section of the park to be developed will be a 57.65-acre section of the southern portion of the Property. This portion will be referred to as “Amherst Town Park South.” The first phase of Amherst Town Park South (called “Phase 1”) will consist of 18 acres of land along Sheridan Drive and North Forest Road. Figure 2 shows the boundary of Phase 1. Phase 1, scheduled for construction to commence in 2024, will be developed in three sub-phases: Phase 1.1, 1.2, and 1.3, these sub-phases are presented in **Figure 2**.

This Report describes the soil characterization activities solely for Phase 1 of Amherst Town Park South. Similar characterization activities will place take place on remaining acreage as the Town Park is developed.

2.2 Site and Surrounding Characteristics

The Site is relatively flat with some minor topographic relief commonly associated with golf courses. Three fairways, greens, and rough are located within the Site and have not been maintained since 2014. The Site contains areas developed with a number of structures consisting of the clubhouse and associated buildings. A berm is located onsite along Sheridan Drive and runs west to east along the full length of the southern Site boundary. The berm is approximately 6 to 10 feet high.

The table below describes the properties / features / roads immediately surrounding the Site.

Direction	Features
North	Maple Road, Audubon Golf Course (par-3 course immediately adjacent to the northeast and full course north of Maple Road)
South	Sheridan Drive, Residential Housing
East	North Forest Road, Brookedge Drive, Ellicott Creek, Amherst Highway DPT, and Residential housing
West	Frankhauser Road, Fairways Boulevard, Residential housing

A Site location map is attached as **Figure 1**.

2.3 Current Property Use

The Site includes several vacant buildings including a former clubhouse, pool house, and maintenance sheds. The remainder of the site consists of a former golf course, which includes parking lots, a driveway, service roads for maintenance, a tennis court, fairways, greens, ponds, bunkers, and a berm on the southern boundary of the site.

2.4 Geology and Hydrogeology

2.4.1 Geology

The Soil Survey of Erie County (U.S. Department of Agriculture, Soil Conservation Service www.websoilsurvey.nrcs.usda.gov) identifies soils on the Site as loamy fine sand, silt loam, and urban land.

The results of the soil borings conducted during the investigation show that the soil is mostly clay in this area with the exceptions of the 9th green and the berm. Specifically, below the grass layer in SB-13, 1-foot of sand was observed followed by 6" of gravel before returning to native clay. In the areas where the berm was located, historic fill material (HFM) was observed at depths 5-10 feet bgs.

Bedrock in the vicinity of the Site consists generally of shale bedrock and the depth to bedrock in the area ranges from approximately 15 to 65 feet. During this boring program, refusal, probable bedrock, was encountered at depths of 11 to 15 feet below grade.

2.4.2 Hydrogeology

Based on a review of NYSDEC data, the Site is not underlain by any mapped principal or primary aquifers. Groundwater at and in the vicinity of the Site is not used for public drinking water supply. Groundwater was evaluated as part of a geotechnical evaluation of the Site completed in 2017 by C&S Engineers for the previous owner. As part of its geotechnical analysis, three groundwater observation wells were installed. Results indicate that the water table is present at 17 to 22 feet beneath the surface, although perched water is present in the upper soils, in some instances within a few feet of the surface. The geotechnical report and data table is provided in **Appendix A**.

2.5 Summary of Soil Characterization

The NYSDEC approved investigation was conducted to assess the nature and extent of contamination at the Site and consisted of:

- The collection and analysis of one sediment sample;
- The advancement of 44 soil borings and collection and analysis of 91 subsurface soil samples;
- the collection of quality assurance / quality control (QA / QC) samples

Soil and sediment samples were analyzed for a combination of Target Analyte List (TAL) metals, mercury, cyanide, and hexavalent chromium.

For the development of this Phase of Amherst Central Park South, the Restricted Residential SCOs apply to Phase 1.3, where the recreational activities are active. In Phases 1.1 and 1.2, the less stringent Commercial Use SCOs would apply to these passive recreational activities.

Only one exceedance (cadmium) of the applicable standards was identified during the site characterization study. Subsequent delineation sampling identified the boundaries of the area surrounding SB-21 with minimal cadmium concentrations above the Commercial Use SCOs.

Figure 2 shows sample locations and results.

3 SOIL MANAGEMENT

3.1 Introduction

The recommended Soil Cleanup Objectives (SCO) for Phase 1.1 and 1.2 is Commercial Use SCOs, and Phase 1.3 will be Restricted Residential Use SCOs. No institutional or engineering controls will be implemented for Phase 1 of this project.

3.2 Site Control

In order to safeguard the health and safety of site workers and the general public, access to all work areas will be restricted. Perimeter fencing will be installed to facilitate site control. Additionally, temporary construction fencing will be erected around accessible excavations and staging areas to prevent unauthorized personnel from entering these areas. Following the completion of remedial efforts, the occupied portion of the Site will be controlled with a perimeter chain-link fence gate.

3.3 Commercial Use (Phases 1.1 and 1.2) Excavation Work Plan – On-Site Soil Reuse

Excavation is planned to occur in only one area within the areal extents of the Phase 1.1 and Phase 1.2 boundaries and will include the removal of soil for off-site disposal surrounding SB-21. All other soils within these areas may be re-used onsite within the extents of Phases 1.1 and 1.2. Material generated from these areas will not be moved to other phases of the project. To ensure proper soil management and re-use during construction, the boundaries of the development Phase areas will be clearly identified, mapped, and marked out in the field.

Good housekeeping practices will be followed during excavation activities to prevent leaving contaminated material on the ground surface (e.g., precautions will be taken to prevent impacts to the ground surface from the potential for materials to spill from the excavator bucket).

3.3.1 Materials Excavation and Load-Out

- With the exception of the material surrounding SB-21, excavated fill may be direct-loaded onto trucks for onsite reuse or stockpiled for later reuse.
- The contractors are responsible for safe execution of all invasive and other work performed under this plan.

- The contractors will investigate the presence of utilities and easements on the Site to determine whether existing utilities or easements will pose a risk or impediment to the planned work under this plan.
- Locations where vehicles enter or exit the site will be inspected daily for control of off-site soil tracking.
- The contractor will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.
- Trucks transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides, as required by 6 NYCRR 364-3.3(d).

3.3.2 Soil Staging Methods

- Soil stockpiles will be continuously encircled with a berm and/or silt sock. Hay bales (or similar methods) will be used as needed near catch basins, surface waters, and other discharge points.
- Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be periodically inspected and any damaged tarp cover will be promptly replaced.

3.3.3 Materials Reuse On-Site

- All materials excavated for construction within this phase are planned to be reused on-site, with the exception of the material surrounding SB-21.
- Material that does not meet Unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6 NYCRR Part 360-16 Registration Facility). Except for the soils surrounding SB-21, material will be placed back into the excavation or reused within the Phase 1.1 or Phase 1.2 boundaries.

3.4 Commercial Use (Phases 1.1 and 1.2) Excavation Work Plan – SB-21 Excavation Work Plan

The location and extent of the soil surrounding SB-21 to be removed is shown on **Figure 3**. The limits measure approximately 70 feet in length, by 40 feet in width, to a depth of no less than 6 inches. Approximately, 40 to 60 tons of material will be removed from this area.

Contaminated excavated material from this area will not be reused in other Phases of the Amherst Town Park. To ensure proper soil management and re-use during construction, the boundaries of this area will be clearly identified, mapped , and marked out in the field.

Good housekeeping practices will be followed during excavation activities to prevent leaving contaminated material on the ground surface (e.g., precautions will be taken to prevent impacts to the ground surface from the potential for materials to spill from the excavator bucket).

3.4.1 Soil Screening Methods

- Visual, olfactory and/or instrument-based (e.g., PID) soil screening will be performed by a C&S scientist or engineer during all excavations in the area surrounding SB-21.
- If grossly contaminated fill, petroleum-impacted soils, or any soil or fill that significantly varies in makeup or description from that encountered during previous investigations are observed, the impacted material will be segregated from the excavated materials, evaluated and, when necessary, handled separately.

3.4.2 Materials Excavation and Load-Out

- Excavated fill may be direct-loaded onto trucks for off-site disposal or stockpiled.
- A C&S qualified environmental professional will observe and document the work during all excavation and load-out in areas known to be contaminated or potentially contaminated.
- The contractor is responsible for safe execution of all invasive and other work performed under this plan.

- The contractor will investigate the presence of utilities and easements on the Site to determine whether existing utilities or easements will pose a risk or impediment to the planned work under this plan.
- Loaded vehicles leaving the site will be appropriately covered, manifested, and/or placarded in accordance with appropriate federal, state, local, and NYSDOT requirements (and all other applicable transportation requirements). To the extent practicable, trucks will travel along routes that avoid residential areas.
- Locations where vehicles enter or exit the site will be inspected daily for evidence of off-site soil tracking.
- The contractor will be responsible for ensuring that all egress points for truck and equipment transport from the site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials. Trucks transporting contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides, as required by 6 NYCRR 364-3.3(d).

3.4.3 Materials Transported Off-Site

- All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.
- Material transported by trucks exiting the Site containing contaminated soil must have either tight-fitting opaque covers that are secured on the sides and/or back, or opaque covers that are locked on all sides, as required by 6 NYCRR 364-3.3(d).
- Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during site remediation and development.

3.4.4 Materials Disposal Off-Site

- Contaminated and regulated material will be transported and disposed in accordance with all local, state (including 6 NYCRR Part 360) and federal regulations.

3.4.5 Materials Reuse On-Site

- No materials from the area surrounding SB-21 shall be reused on-site.

3.4.6 Air Monitoring

When remedial subsurface work is being performed in the area immediately surrounding SB-21, the CAMP included in **Appendix B** will be implemented.

The action threshold for VOCs established in the CAMP is 5 ppm above background. If this value is exceeded for a 15-minute average, work will be halted. Work may resume once instantaneous readings fall below 5 ppm.

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility of the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:
 - (a) Objects to be measured: Dust, mists or aerosols;
 - (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
 - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
 - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
 - (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;

- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;
- (h) Logged Data: Each data point with average concentration, time/date and data point number;
- (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
- (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
- (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
- (l) Operating Temperature: -10 to 50°C (14 to 122°F); and
- (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record-keeping plan.

5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM-10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150 ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

3.5 Restricted Residential Use (Phase 1.3) Excavation Work Plan

Excavation is planned to occur in limited areas within the Phase 1.3 boundary and will include the removal and onsite reuse of soils.

Good housekeeping practices will be followed during excavation activities to prevent leaving contaminated material on the ground surface (e.g., precautions will be taken to prevent impacts to the ground surface from the potential for materials to spill from the excavator bucket).

Materials Excavation and Load-Out and Soil Staging Methods will conform to those listed in Section 3.4 above. No excavated soil is expected to be transported off-site, as all materials excavated for construction within this phase are planned to be reused on-site.

3.6 Erosion and Dust Controls

As part of the remedial actions to be performed in the area of SB-21, measures will be needed to limit erosion and dust generation. Erosion control and dust suppression techniques will be employed as necessary to limit erosion and fugitive dust generated in disturbed areas during remediation and redevelopment activities. Such techniques may be employed even if the community air monitoring results indicate that particulate levels are below action levels. Techniques may include but are not limited to:

- Using silt fencing, hay bales, and / or mulching;
- Applying water on haul roads and ingress / egress points;
- Wetting equipment and excavation surfaces;
- Hauling materials in properly tarped or watertight containers;
- Limiting vehicle speed on the Site;
- Limiting the size of excavations; and
- Covering excavated areas and materials following excavation.

Figures

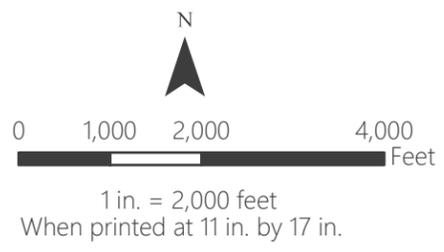
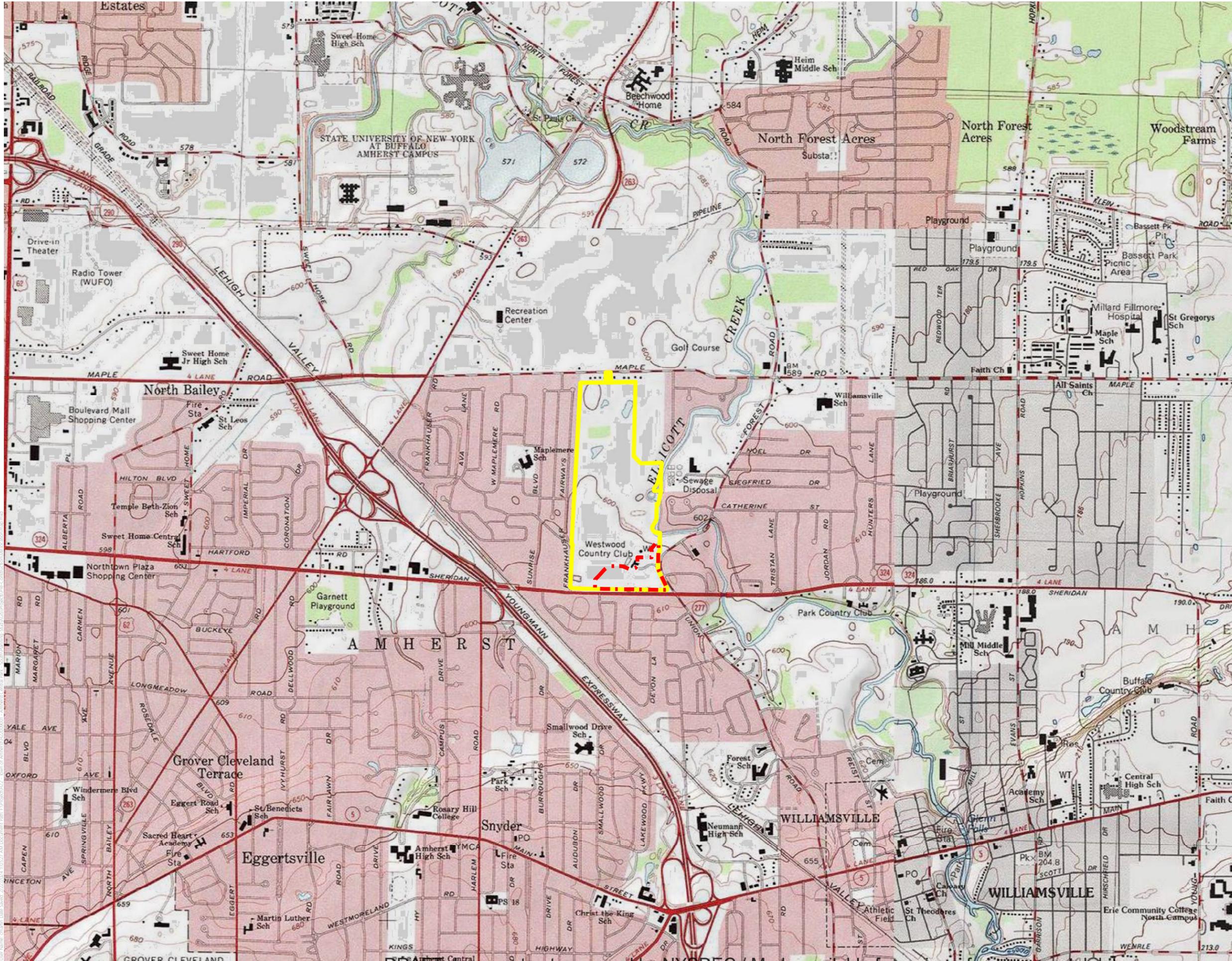
June 2024



Figure 1

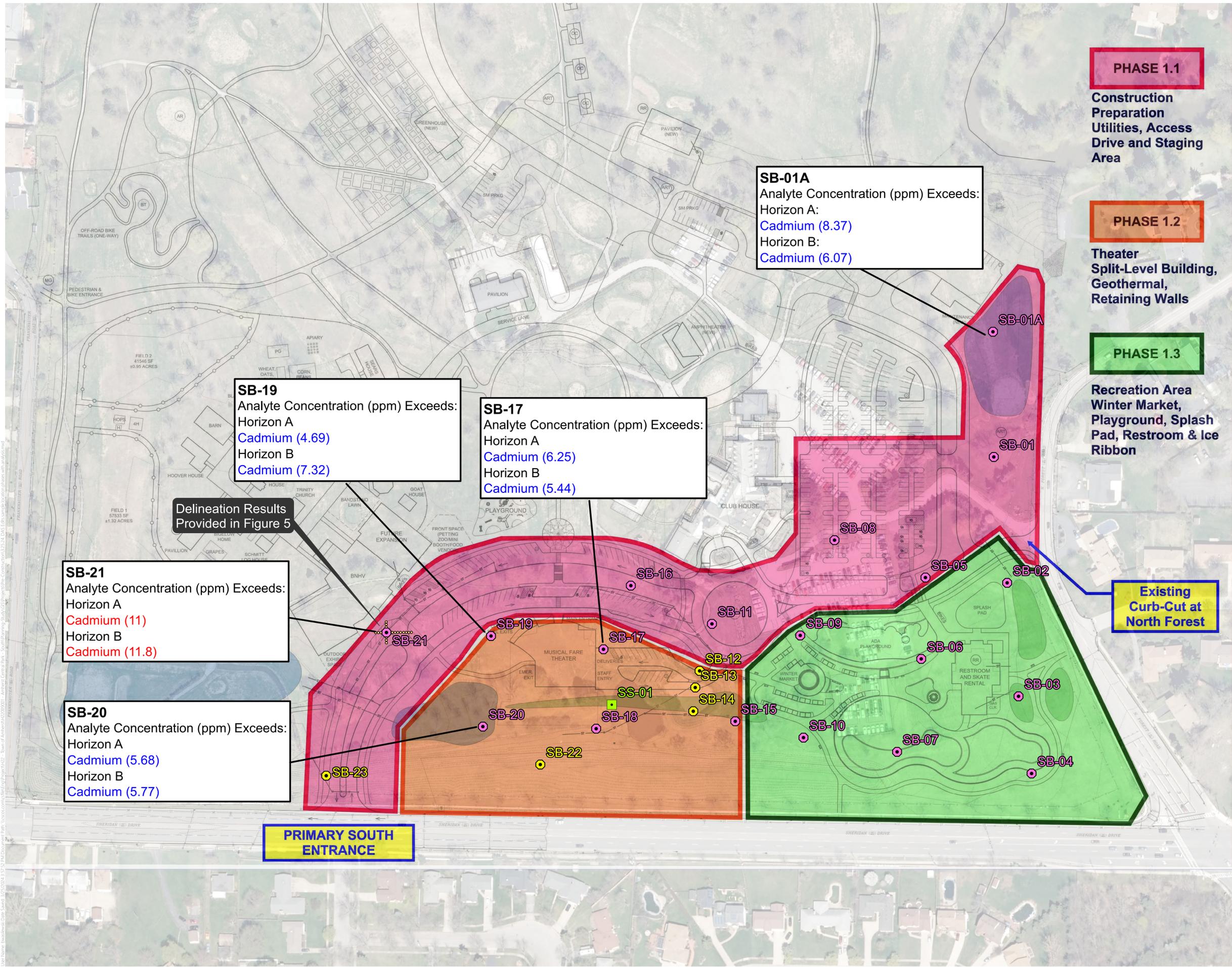
Site Location

-  2024 Phase 1 Construction
-  Former Westwood Country Club Property



Amherst Central Park South Phase 1 Construction

Sources: . Created by C&S Engineers, Inc.



PHASE 1.1

Construction Preparation Utilities, Access Drive and Staging Area

PHASE 1.2

Theater Split-Level Building, Geothermal, Retaining Walls

PHASE 1.3

Recreation Area Winter Market, Playground, Splash Pad, Restroom & Ice Ribbon

SB-01A
Analyte Concentration (ppm) Exceeds:
Horizon A:
Cadmium (8.37)
Horizon B:
Cadmium (6.07)

SB-19
Analyte Concentration (ppm) Exceeds:
Horizon A
Cadmium (4.69)
Horizon B
Cadmium (7.32)

SB-17
Analyte Concentration (ppm) Exceeds:
Horizon A
Cadmium (6.25)
Horizon B
Cadmium (5.44)

SB-21
Analyte Concentration (ppm) Exceeds:
Horizon A
Cadmium (11)
Horizon B
Cadmium (11.8)

SB-20
Analyte Concentration (ppm) Exceeds:
Horizon A
Cadmium (5.68)
Horizon B
Cadmium (5.77)

Delineation Results Provided in Figure 5

Existing Curb-Cut at North Forest

PRIMARY SOUTH ENTRANCE

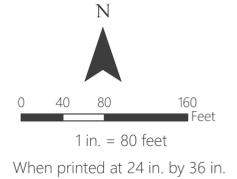
Figure 2

Soil Sample Results (Future Development)

- Sediment Sample Location
- Soil Sample Locations (Hand Auger)
- Soil Sample Locations (Drill Rig)
- Delineation Soil Sample Locations (Drill Rig)

Sample Name
Analyte Concentration (ppm) Exceeds:
Restricted Residential Use
Commercial Use
Industrial Use

Horizon A 0 - 2 inches below grade
Horizon B 2 - 6 inches below grade



Amherst Central Park South Phase 1 Construction

Sources: . Created by C&S Engineers, Inc.

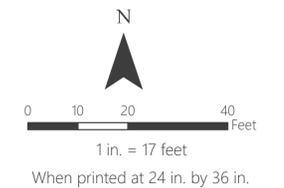
Figure 3

Soil Cleanup Plans

-  SB-21 Sample Location
-  Delineation Soil Sample Locations (Drill Rig)

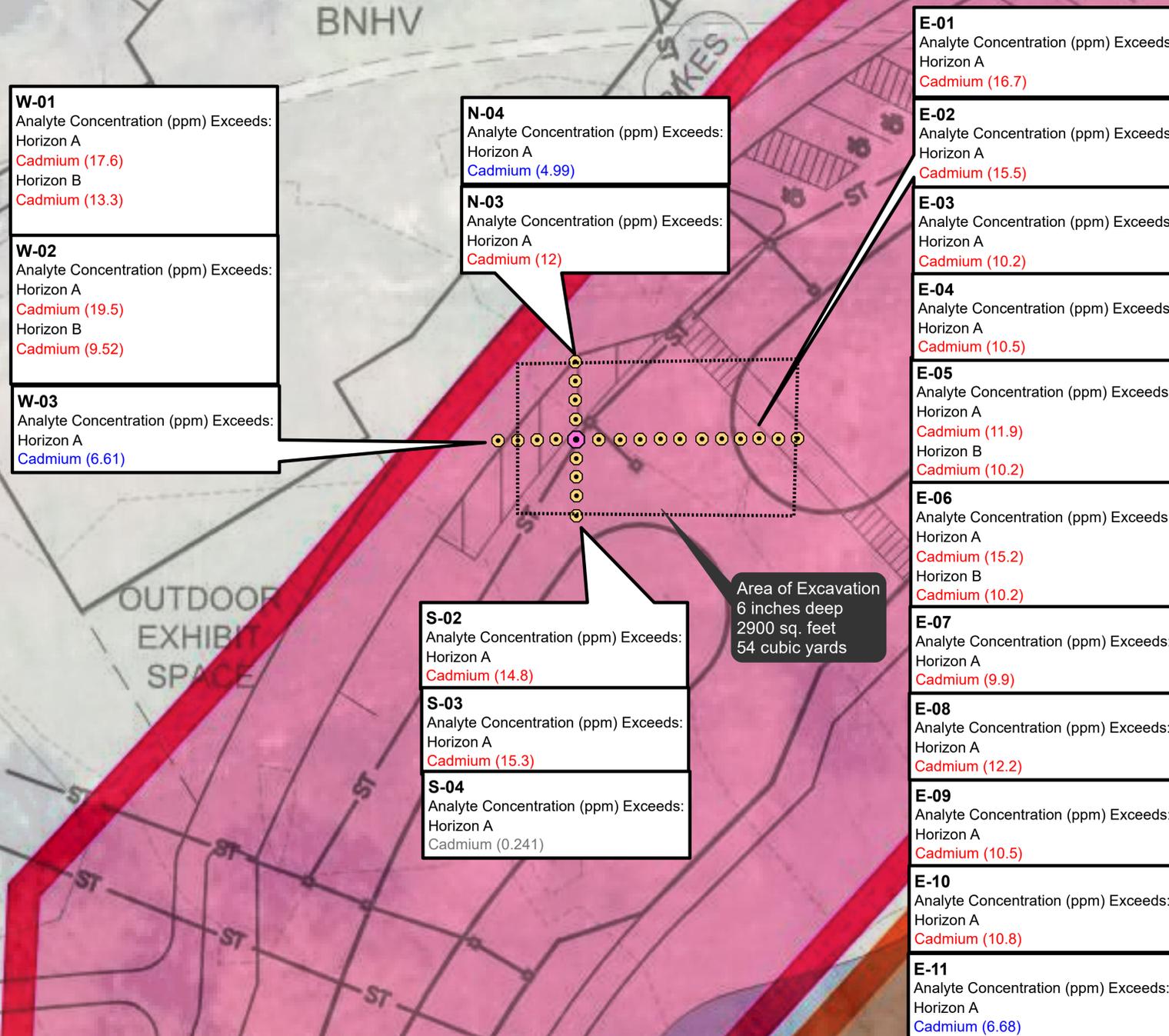
Sample Name
Analyte Concentration (ppm) Exceeds:
Restricted Residential Use
Commercial Use
Industrial Use

Horizon A 0 - 2 inches below grade
 Horizon B 2 - 6 inches below grade



Amherst Central Park South Phase 1 Construction

Sources: . Created by C&S Engineers, Inc.



APPENDIX A

PREVIOUSLY COMPLETED ENVIRONMENTAL INVESTIGATIONS

EMPIRE GEO SERVICES, INC.

A SUBSIDIARY OF SJB SERVICES, INC.

April 24, 2014
Project No. BE-13-192

Mr. Bradley A. Packard, Project Manager
Mensch Capital Partners, LLC
350 Essjay Road, Suite 304
Williamsville, New York 14221

Re: Geotechnical Evaluation Report for
Proposed Westwood Country Club Development Project
North Forest Road
Amherst, New York

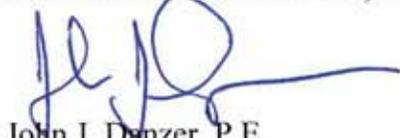
Dear Mr. Packard:

Empire Geo-Services, Inc. is pleased to submit three (3) copies of the enclosed Geotechnical Evaluation Report to Mensch Capital Partners, LLC (Mensch) for the above referenced project. We have also forwarded to you, via e-mail, an electronic pdf file copy of this report for your use and distribution, as appropriate.

Please contact me should you have any questions or wish to discuss this report. Thank you for considering Empire for this work and we look forward to working with you through completion of this project.

Sincerely,

EMPIRE GEO-SERVICES, INC.



John J. Danzer, P.E.
Senior Geotechnical Engineer

Enc.: Geotechnical Evaluation Report (3 Copies) & Electronic pdf file copy /
via e-mail

cc: Mr. Robert J. Pidanick – Nussbaumer & Clarke, Inc. w/ Electronic pdf
copy via e-mail only



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**Geotechnical Evaluation Report for
Proposed Westwood Country Club Redevelopment Project
North Forest Road
Amherst, New York**

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MEMBER

ACEC New York

American Council of Engineering Companies of New York

**Geotechnical Evaluation Report for
Proposed Westwood Country Club Redevelopment Project
North Forest Road
Amherst, New York**

EXECUTIVE SUMMARY

Introduction

This report summarizes the results of a subsurface exploration program and geotechnical engineering evaluation completed by Empire Geo-Services, Inc. (Empire) for a proposed mixed use redevelopment project being considered by Mensch Capital Partners, LLC on the site of the Westwood Country Club off North Forest Road in Amherst, New York. The approximate location of the project site is shown on Figure No. 1.

The proposed redevelopment project is proposed within the existing Westwood Country Club golf course area, which is bounded by Maple Road to the north, North Forest Road, Ellicott Creek and the Audubon Par 3 Golf Course to the east, Sheridan Drive to the south and Frankhauser Road and Fairways Boulevard to the west.

The proposed redevelopment project is currently planned to include the following:

- 1 to 2 story single family residential home lots in the northern eastern portion of the site;
- Adjoining 1 to 2 story townhome style residential units in the northern western portion of the site;
- Larger 1 to 2 story single family residential home lots in the eastern center portion of the site;
- An approximate 30 acre parcel in the west center portion of the site for senior living development;
- Mixed use town center type development in the southern portion of the site including commercial/retail buildings, office buildings, multi family townhomes and multi family apartments; and
- Re-use of the existing club house building for conference and reception use, in association with construction of an adjoining hotel building.

In addition the project will also include construction of roadways, access drives and parking lot areas with access to the development from Sheridan Drive and Maple Road.

The subsurface exploration program consisted of a total of forty-nine (49) test borings, designated as B-1 through B-49, which were advanced across the site. Thirty (30) borings were advanced to apparent bedrock refusal, with the remaining nineteen (19) borings being advanced to a planned depth of 20 feet and then terminated. Apparent bedrock refusal was encountered at depths ranging between 13.5 feet and 62.5 feet and confirmed by rock coring in seven (7) of the test borings. Three (3) groundwater observation wells

were installed in borings B-6, B-24 and B-48 to help assess groundwater conditions on the site, Geotechnical laboratory testing of selected recovered soil samples was also completed.

SJB Services, Inc. (SJB), our affiliated drilling and materials testing company, completed the test borings and laboratory testing for the subsurface exploration program. The test borings and groundwater observation well installations were completed between December 3rd, 2013 and February 5, 2014. The approximate locations of the test borings with respect to an aerial photograph of the existing site are shown on Figure No. 2 and the approximate locations of the test borings with respect to the currently proposed conceptual site development plan are shown on Figure No. 3.

The elevations presented in this report were referenced to the rim of an electrical manhole (temporary benchmark established by SJB), which is located off the front of the existing golf cart storage building, located in the south center portion of the site, as shown on Figure No. 2. This benchmark has an elevation El. datum of 602.38 feet, as measured and reported by Nussbaumer & Clarke, Inc.

This report summarizes the subsurface conditions encountered by the exploration program and presents preliminary geotechnical engineering considerations and recommendations to assist in planning and preliminary design of the site redevelopment. Specifically our evaluation addresses the soil, bedrock and groundwater conditions present on the site, with regard to their impacts on foundation, slab-on-grade floor construction, underground utility construction and pavement construction.

Existing Site Information

As part of our study Empire researched existing information concerning the geologic and flood plain conditions present in the Westwood Country Club site area, including the Soil Survey for Erie County, Surficial Geology and Bedrock Geology Maps, and FEMA Flood Plain Mapping.

The USDA – Erie County Soil Survey data indicate that the surficial soils (i.e. soils typically within the upper 5 feet of the existing ground surface) within the Westwood Country Club facility site consist predominately of “clay loam”, “silt loam”, and “loamy fine sand” type soils. These surficial soil types are similarly classified as CL, ML and SM group soils using the Unified Soil Classification System (USCS), respectively.

Geologic maps prepared by the New York State Geological Survey indicate the surficial overburden soils present consist predominately of glacial till deposits of clay, silt and bouldery clay, with glacial outwash deposits of sand and gravel along Ellicott Creek. The uppermost bedrock formation in this area is the upper (late) Silurian period, Camillus Shale formation of the Salina Geologic Group. This bedrock formation is characterized as medium hard, weathered to sound Shale rock, with occasional gypsum partings and seams and has a generally fair to good rock mass quality.

The FEMA flood plain mapping indicates the 500 year and 100 year flood plains from Ellicott Creek extend into the eastern portions of the Westwood Country Club facility site. The 500 year flood elevations range from El. 595 feet to El. 594 feet where it extends onto the site from the southern end to the center portion, and to about El. 593 feet where it extends onto the northern portion of the site.

Subsurface Exploration Results

The subsurface conditions encountered in the test borings consisted generally of surface topsoil, along with man placed fill or disturbed indigenous soils typically extending to depths ranging between about 2 feet and 5 feet, which are underlain by predominately indigenous glacial till deposited silty clay, clayey silt, silt, and silty or clayey sand soils, overlying the Camillus Shale Bedrock. Table 2 summarizes the surface topsoil depths, the depths and bottom elevation of the man-placed fill, the depth and elevation of auger refusal (i.e. apparent bedrock refusal), and the groundwater observations made in the test borings and the wells installed for this investigation.

The indigenous soils are classified as CL, CH, ML, SM-SC and SM group soils using the Unified Soil Classification System (ASTM D2488). The consistency of the cohesive silty clay and clayey silt soils typically ranged between medium and hard, while the more granular silty or clayey sand soils and the non-plastic silt soils were typically of a firm to very compact relative density. Deeper soft to very soft clay soil deposits having SPT “N” values of less than 4 or “woh - weight of hammer” (i.e. the sample spoon was advanced with only the weight of the drop hammer and drill rods applied statically to the sample spoon), were encountered in only a few test borings (B-1, B-18, B-20 and B-25). Accordingly, significant deposits of highly compressible soft to very soft clays, as present in other portions of northern Amherst, are generally absent within this site.

Shale bedrock, as indicated by the auger refusal conditions, and confirmed by rock coring, was encountered at depths ranging between about 13.5 feet (boring B-10) and 62.5 feet (boring B-1), with corresponding elevations ranging between approximately El. 586.9 feet to El. 543.4 feet. The bedrock core recovered consisted generally of gray, medium hard, sound, thinly bedded to bedded Shale Rock, with occasional partings, seams and layers of gypsum. The core recoveries ranged between 100% and 50%, and the rock quality designation (RQD) values ranged between 20% and 82% indicating the recovered rock cores have a varying rock mass quality ranging between “very poor” and “good”.

Based on the water levels obtained at the completion of coring in borings B-4, B-43 and B-48, as well as the readings obtained in borings B-9, B-20 and B-25 following completion soil sampling to auger refusal, and the April 1st, 2014 level in well B-24 tends to suggest that a permanent groundwater table may be present at elevations in the range of about El 580 feet to El. 589 feet, although this is not confirmed by the other groundwater observation wells at this time, as they may be partially impacted by upper perched groundwater..

It also appears that zones of perched or trapped groundwater are present in the topsoil and the fill soils at or near the ground surface, at various locations on the site, due to the relatively low permeability of the underlying soils present, and depending on site drainage conditions. Such conditions were observed during the subsurface exploration where areas of standing water and spongy surface conditions were present, hindering some of the drill rig access.

Laboratory Test Results

The laboratory test data indicates the clay soils encountered within the upper reaches of the site below the immediate surface soils, (i.e. within the anticipated depths of proposed spread foundations) appear to be partially desiccated and have a generally non-existent to low potential susceptibility to shrinkage. Also, given the relatively medium stiff to hard nature of the indigenous clay soils and their inherent low permeability it is unlikely saturation and potential swelling of these soils would occur in an undisturbed state. The upper surficial clayey silt /silty clay fill soils, however, which are in a less dense condition, may be more susceptible to potential shrinkage and swelling where they are inundated with poor draining surface water.

Based on DIPRA tests performed the site soils tested appear to have a low corrosion potential to ductile iron waterline pipes and other buried metallic pipes/elements. Accordingly, cathodic protection or a suitable protective coating of metallic pipes and conduits, to resist potential corrosion, does not appear necessary. Also based on sulfate concentrations, the soils are considered to have a negligible potential for sulfate exposure. Accordingly, a Type I-II Portland Cement appears will be acceptable for the concrete structure elements placed in these soils.

Preliminary Geotechnical Considerations and Recommendations

General

The indigenous soils encountered consist predominately of partially desiccated, medium stiff to hard silty clay and clayey silt and firm to very compact silty or clayey sand deposits with some intermixed gravel, and occasional cobbles/boulders and shale fragments. These soils are non-organic, and are not considered to be highly compressible, nor highly susceptible to shrinkage, swelling, or liquefaction. Significant deposits of highly moist, soft to very soft clays, as present in other areas of northern Amherst and which have been problematic to residential foundation/structure movement and distress (i.e. basement foundation subsidence / settlement and lateral movement), are generally absent within this site.

The indigenous soil conditions encountered in the test borings are generally considered suitable to support the anticipated residential and mixed use structure loads using conventional spread foundation systems. In a few cases (i.e. within borings B-9, B-11, B-19, B-21, B-22 and B-45) some limited zones of weaker soils were encountered which may impact the use of spread foundations. Accordingly, these conditions possibly may

require consideration of deep foundations (i.e. driven piles) particularly if a multiple-story more heavily loaded building structure would be proposed at or near these locations.

The existing fill and indigenous soil subgrades are also considered to be generally suitable for basement, at-grade and garage slab-on-grade floor construction, with proper site preparation. The soils encountered are also considered generally suitable for construction of the proposed infrastructure, including the roadways, parking lots, storm and sanitary sewers, waterlines and retention pond structures. The poor draining surface conditions, however, are expected to make site stripping and subgrade preparation difficult, particularly during wet periods

Given, the relatively low to medium low permeability of the soils present, both permanent and perched groundwater seepage if encountered should be relatively slow and of low quantities. Accordingly, these conditions should not significantly impact basement and utility construction. It is anticipated that conventional sump and pump methods of dewatering should generally be sufficient to control surface water, as well as permanent and perched groundwater seepage conditions, should they be encountered.

Based on the subsurface conditions encountered, the overall site should be classified as Seismic Site Class “D” in accordance with the Building Code of New York State. Therefore, seismic design may be based on this site classification.

Foundation Support

Preliminarily, it is expected that spread foundations can be sized, based on net allowable bearing capacities in the range of about 2,000 to 4,000 pounds per square foot (psf) ±, depending on location, foundation bearing depths and actual structure loads.

Spread foundations should bear on suitable, undisturbed, indigenous soil bearing grades, after the removal of all fill soils and any unsuitable indigenous soft or wet soils. Alternatively, the foundations may also bear on Engineered Fill (i.e. compacted Structural Fill or flowable backfill), which is placed over the suitable indigenous soil bearing grades, following excavation and removal of fill soils and any unsuitable indigenous soils which are present below the design bearing grade elevation of the footings.

Where zones of softer soils were encountered, which may impact the use of spread foundations for heavier building structures, the use of driven H-piles or pipe piles driven to refusal on the Shale bedrock appear would be the best suited deep foundation system option for the site conditions present. For preliminary information, a driven HP12x53 H-pile, driven to refusal on the bedrock, would be expected to develop an axial compressive capacity in the range of about 100 to 120 tons ± per pile. Other pile sections can also be used, based on product availability and costs, which would provide higher or lower allowable axial capacities, based on the actual pile section.

Basement Structure Design

Where suitable foundation drainage is provided, the basement walls can be designed for “at rest” lateral earth pressure computed on the basis of an “equivalent fluid unit weight” of 70 pounds per cubic foot (pcf). This is based on the assumption that the wall backfill beyond the drainage system is a suitable well draining granular backfill material, such as a crusher run stone Structural Fill. In this case suitable damp proofing of the walls and floors should also be provided. Alternatively, the basement structures could also be designed to resist potential full hydrostatic pressure. In such case the basement structure should also be fully water proofed.

The use of the on-site clayey silt, silty clay and silty or clayey sand soils to backfill the basement walls is not recommended as they will be susceptible to potential swelling in a looser disturbed state, which could cause additional lateral pressures on the basement walls. The on-site soils could be used, however, to backfill non-earth retaining foundation walls provided they can be properly placed and compacted to a stable and well engineered condition.

Slab-on Grade Floor Construction

The building floors can be constructed as slab-on-grade following proper subgrade preparation. For preliminary design purposes, a minimum of 6-inches of Subbase Stone is recommended beneath the lightly loaded floor slabs (residential floors, lightly loaded office floors, etc.). A minimum 12-inch thick layer of Subbase Stone is recommended beneath more heavily loaded floor slabs (i.e. garage areas, storage areas, mechanical rooms, etc.). A suitable stabilization/separation geotextile, such as Mirafi 500X, should be placed over the existing soil or fill soil subgrades prior to placement of the Subbase Stone layer.

Seismic Design Considerations

Based on the subsurface conditions encountered, the overall site should be classified as Seismic Site Class “D” in accordance with the Building Code of New York State. The soil conditions encountered are generally not considered to be susceptible to potential liquefaction in the case of a seismic event. Therefore, seismic design may proceed based on these considerations.

It is possible that a seismic shear wave velocity study of the site may refine and possibly upgrade the seismic design site class. This may be particularly beneficial in the areas of the mixed use commercial and apartment buildings depending on the costs associated with seismic reinforcement of these structures. It should be understood, however, that there is no guarantee that an upgrade can be made if a seismic shear wave study is performed,

Pavement Design Considerations

The Town of Amherst requires a typical pavement section consisting of the following components for residential and commercial development roadways:

Town of Amherst Asphalt Concrete Pavement Section:

- 1.5 inches – Top Course
- 2.5 inches – Binder Course
- 4.0 inches – Base Course
- 11 inches – Subbase Stone Course

We would recommend, however, the Town of Amherst pavement section also include a suitable stabilization/separation geotextile (i.e. Mirafi 600X or suitable equivalent).

Pavement design recommendations are also provided for two (2) flexible pavement structure types within the proposed mixed use development areas. These include the following:

Heavy Duty Asphalt Concrete Pavement (for the entrance, access drives and pavement areas, which will be subject to delivery truck traffic):

- 1.5 inches – Top Course
- 3.0 inches – Binder Course
- 15 inches – Subbase Stone Course
- Stabilization/Separation Geotextile
- Prepared Subgrade

Light Duty Asphalt Concrete Pavement (for automobile / light SUV only parking areas):

- 1.5 inches – Top Course
- 2.0 inches – Binder Course
- 10 inches – Subbase Stone Course
- Stabilization/Separation Geotextile
- Prepared Subgrade

The installation of suitable drainage is also recommended to drain the pavement subbase course and subgrades in order to limit the potential for frost action and improve pavement structure performance and design life.

Underground Utility Construction

The in-situ soils should provide generally suitable subgrade conditions for underground utility construction, including storm and sanitary sewers, water lines, gas lines and buried

electrical / communication conduits. Accordingly, standard bedding materials and thicknesses can generally be used to support this infrastructure.

Site Preparation

Measures to improve site drainage should be implemented as necessary prior to commencing the site stripping and subgrade preparation work.

All existing structures, trees, stumps, vegetation, topsoil, organic soils, etc., and any other deleterious materials within the proposed building pad areas and pavement areas should be removed. Following stripping and removal of the surface materials (i.e. topsoil, asphalt pavement, concrete pads and structures, etc.), the exposed subgrades should be proof-rolled. The subgrade proof-rolling should be done under the guidance of, and observed by qualified geotechnical engineering personnel. The subgrade fill placement necessary to raise the site grades and/or the placement of subbase courses may proceed following proper site preparation and acceptance of the existing soil subgrades.

The on-site soils could be used for constructing the fills for establishing the building pad and pavement areas, provided they can be properly placed and compacted in a controlled manner and to a stable well engineered condition, in accordance with our recommendations. It should be understood, however, that these soils will be very difficult to dry and work with. Therefore the use of imported granular fill materials will be better suited for building pad, roadway and parking lot fill areas. Efforts should be made to maintain the subgrades in a dry and stable condition at all times, and limit construction traffic directly over these soils, particularly if they become wet.

Additional Geotechnical Investigations

Additional investigations and further evaluations are recommended for final design when final building development plans and loading conditions, along with final site development plans, are established, as discussed further in the report. Empire can assist in planning the locations and scope of the additional explorations and evaluations that may be necessary for final design.

Closing

Additional more detailed site condition findings, along with considerations and recommendations for permitting, planning and preliminary design of the proposed site redevelopment project are presented in the Geotechnical Evaluation Report, which follows.

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1.00 INTRODUCTION

1.10 GENERAL

This report summarizes the results of a subsurface exploration program and geotechnical engineering evaluation completed by Empire Geo-Services, Inc. (Empire) for a proposed mixed use redevelopment project being considered on the site of the Westwood Country Club off North Forest Road in Amherst, New York. The approximate location of the project site is shown on Figure No. 1.

Mensch Capital Partners, LLC (Mensch) retained Empire to complete this work, which was done in accordance with our proposal dated October 11, 2013. This work was completed to evaluate the geotechnical characteristics of the site, with regard to foundation support of the proposed mixed use buildings being considered for redevelopment of the site, and to provide preliminary geotechnical design and construction considerations / recommendations to assist the design team with planning and preliminary design.

The subsurface exploration program completed by Empire consisted of a total of forty-nine (49) test borings advanced across the site, of which thirty (30) borings were advanced to apparent bedrock refusal at depths ranging between 13.5 feet and 62.5 feet, with the remaining nineteen (19) borings being advanced to a planned depth of 20 feet and then terminated. Bedrock was cored in seven (7) of the test borings advanced to refusal. In addition, three (3) groundwater observation wells were installed and geotechnical laboratory testing of selected recovered soil samples was also completed. SJB Services, Inc. (SJB), our affiliated drilling and materials testing company, completed the test borings and laboratory testing for the subsurface exploration program.

On this basis, Empire prepared this report, which summarizes the subsurface conditions encountered by the test borings, groundwater observation wells and laboratory testing, and presents preliminary geotechnical engineering considerations and recommendations to assist in planning and preliminary design of the site redevelopment. Specifically our evaluation addresses the soil, bedrock and groundwater conditions present on the site, with regard to their impacts on foundation, slab-on-grade floor construction, underground utility construction and pavement construction.

1.20 SITE DESCRIPTION AND PROPOSED DEVELOPMENT PROJECT

The proposed site redevelopment project comprises approximately 170 acres and is bounded within the area of Maple Road to the north, North Forest Road, Ellicott Creek and the Audubon Par 3 Golf Course to the east, Sheridan Drive to the south and Frankhauser Road and Fairways Boulevard to the west. The redevelopment project is generally proposed within the existing Westwood Country Club golf course area, which currently consists of the golf tees, fairways, hazards, greens along with bordering cart paths, tall grass, trees, brush and ponds. The main club house building, pool and tennis amenities, maintenance buildings, access drive and parking lot areas are located in the southeast portion of the site, with access from North Forest Road. Grades across the site gradually drop in elevation about 10 to 13 feet from south (i.e. Sheridan Drive) to north (Maple Road). Figure No. 2 presents an aerial photograph of the existing site, along with the approximate locations of the test borings plotted on the plan.

The proposed redevelopment project is currently planned to include the following:

- 1 to 2 story single family residential home lots in the northern eastern portion of the site;
- Adjoining 1 to 2 story townhome style residential units in the northern western portion of the site;
- Larger 1 to 2 story single family residential home lots in the eastern center portion of the site;
- An approximate 30 acre parcel in the west center portion of the site for senior living development;
- Mixed use town center type development in the southern portion of the site including commercial/retail buildings, office buildings, multi family townhomes and multi family apartments; and
- Re-use of the existing club house building for conference and reception use, in association with construction of an adjoining hotel building.

In addition the project will also include construction of roadways, access drives and parking lot areas with access to the development from Sheridan Drive and Maple Road. Figure No. 3 presents a conceptual plan of the proposed site development along with the approximate locations of the test borings plotted on the plan.

The 1 to 2 story single family residential homes and townhome residential units are expected to consist of wood framed construction, with possible basement structures. The commercial/retail buildings, office buildings, multi family townhomes and multi family apartments are also expected to be 1 to 2 stories with

either wood or steel frame type construction, and with at grade ground floors constructed as slab-on-grade. Accordingly, basements are not anticipated for these structures. The new hotel building is expected to be multiple-story with steel frame or masonry with pre-cast plank type construction. The hotel building is also not expected to include a basement structure.

At this time the final building configurations and structure loads have not been established. The development plan currently anticipates that the building structures can generally be supported using conventional spread foundation systems, although it is understood that deep foundation systems could be necessary in some cases, depending on the actual structure loads and soil conditions present.

2.00 SUBSURFACE EXPLORATION

The subsurface exploration program completed to characterize the subsurface conditions consisted of a total of forty-nine (49) test borings, designated as B-1 through B-49. In addition, groundwater observation wells were installed in three (3) of the test borings (B-6, B-24 and B-48). The test borings and groundwater observation well installations were completed by SJB between December 3rd, 2013 and February 5, 2014. The approximate locations of the test borings with respect to an aerial photograph of the existing site are shown on Figure No. 2 and the approximate locations of the test borings with respect to the currently proposed conceptual site development plan are shown on Figure No. 3.

The proposed test boring locations were initially established on a site plan, along with location coordinates, prepared by Nussbaumer & Clarke, Inc. (N&C), which were provided to Empire through Mensch. The boring locations were established to provide general coverage over the project site. Using this plan and the location coordinates, SJB then staked the boring locations in the field using hand held global positioning satellite (gps) instrumentation and visual observations referenced to existing site features. The locations should be considered accurate only to the degree implied by the methodologies used.

The ground surface elevation at each test boring location was measured and recorded by SJB using laser survey level techniques. The elevations were referenced to the rim of an electrical manhole (benchmark established by SJB) located off the front of the existing golf cart storage building, located in the south center portion of the site. The approximate location of the benchmark is shown on Figure No. 2 and has an elevation El. datum of 602.38 feet, as measured and reported by N&C.

Thirty (30) borings were advanced to apparent bedrock refusal at depths ranging between 13.5 feet and 62.5 feet, with the remaining nineteen (19) boring advanced to a depths ranging between about 18 feet and 22 feet. Bedrock was cored in seven (7) of the test borings advanced to refusal (borings B-1, B-4, B-29, B-31, B-43, B-45 and B-47). The borings advanced to apparent bedrock refusal and the borings advanced to a depth of 18 to 22 feet (scheduled to be 20 feet) are designated on Figures No. 2 and No. 3.

The test borings were made using a Central Mine Equipment (CME) model 550X and a CME model 550SE rubber tire, all terrain drill rigs, using hollow stem auger and split spoon sampling techniques. Split spoon samples and Standard Penetration Tests (SPTs) were taken continuously from the ground surface to a depth of 12 feet or 16 feet and in intervals of five feet or less below the zone of continuous sampling until boring completion. The split spoon sampling and SPTs were completed in general accordance with *ASTM D 1586 - "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils"*.

After reaching auger refusal at test boring locations B-1, B-4, B-29, B-31, B-43, B-45 and B-47 the refusal material encountered was cored using a NQ size double tube core barrel in accordance with *ASTM D 2113 - "Standard Practice for Rock core Drilling and Sampling of Rock for Site Investigation"*. Five (5) feet of bedrock was cored at each of these locations.

Groundwater observation wells were installed in test borings B-6, B-24 and B-48 to help assess groundwater levels on the site. The wells were installed with hollow stem auger drilling techniques in general accordance with *ASTM D5092 Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers*. The well installation consisted of a 2-inch diameter PVC well screen and riser pipe with sand filter, bentonite seal and soil backfill. A protective flush mount surface casing and surrounding concrete seal were installed at the surface of boring B-6 to finish the well installation. The wells installed at borings B-24 and B-48 were completed with a PVC stickup riser and cap, and without a protective surface casing. Additional details regarding the construction of the observation wells are shown on the Monitoring Well Completion Records presented following their respective test boring logs in Appendix A.

A geologist from SJB prepared the test boring logs based on visual observation of the recovered soil samples and bedrock core, along with review of the driller's field notes. The soil samples were described based on visual/manual estimation of the grain size distribution, along with characteristics such as color, relative density, consistency, moisture, etc. In addition the Unified Soil Classification System

(USCS) group symbols were also established and are presented on the logs for the soil types encountered. The recovered rock core samples were also described, including characteristics such as color, rock type, hardness, weathering, bedding thickness, core recovery and rock quality designation (RQD). The test boring logs are presented in Appendix A, along with general information and a key of terms and symbols used to prepare the logs.

3.00 LABORATORY TESTING PROGRAM

Selected recovered soil samples were tested in SJB's geotechnical testing laboratory to confirm the visual soil classifications and provide index properties to aid in our evaluations. The laboratory testing program included the following index tests:

1. Moisture content in accordance with *ASTM D 2216 – “Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass”*.
2. Grain size distribution in general accordance with *ASTM C136 – “Standard Test Method for Particle-Size Analysis of Soils”*;
3. Liquid limit, plastic limit and plasticity index in accordance with *ASTM D 4318 – “Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils”*.
4. In addition, the samples tested for liquid limit, plastic limit and plasticity index were also tested for shrinkage limit in accordance with *ASTM D 427 – “Test Method for Shrinkage Factors of Soils by Mercury Method”*. Using the shrinkage test data and the moisture content data, Empire calculated the coefficient of linear extensibility (COLE factor) of the clay soils at the various measured moisture contents, to qualitatively evaluate their shrinkage potential. The COLE factors were determined following a procedure similar to those described in the *Soil Survey Investigation Report No. 42, Soil Survey Laboratory Methods Manual 1996, USDA, NRCS, NSSC*.

The soil samples tested for the above index properties, as well as a summary of the results, are presented on Table 1.

Composite soil samples were also prepared from test borings B-6 (samples S-2 through S-4, 2.0'-8.0'); B-34 (samples S-2 through S-5, 2.0'-10.0'); and B-45 (samples S-2 through S-5, 2.0'-10.0') and were tested for the following:

- Resistivity, redox, pH, moisture, and sulfides according to procedures established by the Ductile Iron Pipe Research Association (DIPRA test) to provide an indication of the corrosion potential of the on-site soils with regard to buried metallic conduits; and
- Sulfate and chloride concentration in the soils, with regard to potential impacts on buried concrete structures.

This laboratory test data is also presented in Appendix B, as well as summarized on Table 1.

4.00 EXISTING SITE INFORMATION

As part of our study Empire researched existing information concerning the geologic and flood plain conditions present in the Westwood Country Club site area. This included:

- USDA - Natural Resource Conservation Service - Soil Survey for Erie County (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>);
- NYSED – New York State Museum and Science Service - Surficial Geology and Bedrock Geology Maps (<http://www.nysm.nysed.gov/gis/>); and
- Erie County On-Line GIS Mapping System – FEMA Flood Plain Mapping (<http://gis1.erie.gov/Geocortex/Essentials/Web/viewer.aspx?Site=FEMA&reloadkey=true>).

4.10 SOIL SURVEY INFORMATION

The USDA – Erie County Soil Survey data indicate that the surficial soils (i.e. soils typically within the upper 5 feet of the existing ground surface) within the Westwood Country Club facility site consist predominately of “clay loam”, “silt loam”, and “loamy fine sand” type soils. These surficial soil types are similarly classified as CL, ML and SM group soils using the Unified Soil Classification System (USCS), respectively.

These soils typically consist of silty clay, clayey silt, non-plastic silt and silty fine sand and are of a medium-low to low permeability (i.e. poor draining). These soils are also considered to be highly moisture sensitive and have a relatively poor value (i.e. difficult to place and compact) as subgrade fill material to raise site grades beneath slab-on-grade and pavement construction. The locations of the various surficial soil types, as mapped by the Erie County Soil Survey, are presented in Appendix C1.

4.20 SURFICIAL AND BEDROCK GEOLOGY

Geologic maps prepared by the New York State Geological Survey indicate the surficial overburden soils present within the Westwood Country Club facility site consist predominately of glacial till deposits of clay, silt and bouldery clay, with glacial outwash deposits of sand and gravel along Ellicott Creek.

The geologic maps indicate the uppermost bedrock formation in this area is the upper (late) Silurian period, Camillus Shale formation of the Salina Geologic Group. This bedrock formation is characterized as medium hard, weathered to sound Shale rock, with occasional gypsum partings and seams and has a generally fair to good rock mass quality.

Excerpted portions of the surficial soil and bedrock geologic maps, along with applicable associated legends, are presented in Appendix C2.

4.30 FLOOD PLAIN MAPPING

Review of the FEMA flood plain mapping indicates the 500 year and 100 year flood plains from Ellicott Creek extend into the eastern portions of the Westwood Country Club facility site. The 500 year flood elevations range from El. 595 feet to El. 594 feet where it extends onto the site from the southern end to the center portion, and at about El. 593 feet where it extends onto the northern portion of the site.

The flood plain mapping obtained from the Erie County On-Line GIS Mapping System is presented in Appendix C3.

5.00 SUBSURFACE CONDITIONS

5.10 GENERAL SUBSURFACE CONDITIONS ENCOUNTERED

The test borings completed at the site encountered soil and bedrock conditions generally similar to those indicated by existing site information which was researched, as described above in Section 4.00. The stratigraphy encountered in the test borings consisted generally of surface topsoil, along with man placed fill or disturbed indigenous soils typically extending to depths ranging between about 2 feet and 5 feet, which are underlain by indigenous glacial till deposited silty clay, clayey silt, silt, and silty or clayey sand soils, overlying Shale Bedrock.

The consistency of the cohesive silty clay and clayey silt soils typically ranged between medium and hard, while the more granular silty or clayey sand soils and the non-plastic silt soils were typically of a firm to very compact relative density. Deeper soft to very soft clay soil deposits having SPT “N” values of less than 4 or “woh - weight of hammer” (i.e. the sample spoon was advanced with only the weight of the drop hammer and drill rods applied statically to the sample spoon), were encountered in only a few test borings (B-1, B-18, B-20 and B-25). Accordingly, significant deposits of wet, highly compressible, soft to very soft clays, as present in other portions of northern Amherst, are generally absent within this site.

Shale bedrock, as indicated by the auger refusal conditions, and confirmed by rock coring, was encountered at depths ranging between about 13.5 feet (boring B-10) and 62.5 feet (boring B-1), with corresponding elevations ranging between approximately El. 586.9 feet to El. 543.4 feet, with an average elevation of about El. 560.1 feet.

Groundwater levels measured in the groundwater observation wells (B-6, B-24 and B-48) ranged between depths of 0.6 feet, 8.2 feet and 2.4 feet bgs, respectively, during the site visit on April 1st, 2014.

The soil and bedrock stratigraphy encountered and the groundwater conditions observed are described in more detail in the following sections and on the test boring logs presented in Appendix A. Also included, is a table (Table 2) summarizing the surface topsoil depths, the depths and bottom elevation of the man-placed fill, the depth and elevation of auger refusal (i.e. apparent bedrock refusal), and the groundwater observations made in the test borings and the wells installed for this investigation.

5.20 SURFACE MATERIALS AND FILL SOILS

The driller noted a distinct topsoil layer at the ground surface of most of the test borings, with the exception of test borings B-21, B-27 and B-38. The topsoil thickness typically ranged between about 2-inches and 14-inches, based on the driller's measurements and interpretation of topsoil. These measurements are widely spaced and are subject to interpretation. Therefore, these measurements should not be solely relied on for construction quantity estimates.

Beneath the topsoil and at the ground surface of the remaining test borings, man placed fill and/or disturbed or reworked indigenous soils were encountered at most of the test boring locations. The fill soils consisted of red-brown, brown-black and black clayey silt and silty clay soils with occasional zones or inclusions of organics, cinders and wood. The fill, where present, was typically found to extend to depths ranging between about 2 feet and 5 feet bgs.

Most of the fill soils are similar in character to the indigenous soils and appear were most likely placed during past site grading associated with the country club development. It can be expected that fill soils will also be present, and will extend to the bottom of the existing foundations near and adjacent to the existing building structures and amenities as well as to the bottom of previous excavations for existing utility lines within the site.

5.30 INDIGENOUS SOILS

The indigenous soil deposits encountered beneath the surface materials and fill consisted predominately of glacial till deposited silty clay, clayey silt, silt and silty or clayey sand soils, which also contain some intermixed gravel, apparent occasional cobbles/boulders and shale fragments. These indigenous soil deposits were found to extend to the top of bedrock. The indigenous soils are classified as CL, CH, ML, SM-SC and SM group soils using the Unified Soil Classification System (ASTM D2488).

Standard Penetration Test (SPT) "N" values obtained in the indigenous silty clay and clayey silt soils ranged from "woh - weight of hammer" (i.e. the sample spoon was advanced with only the weight of the drop hammer and drill rods applied statically to the sample spoon), to "REF - sample spoon refusal" (i.e. 50 blows to advance the split spoon with 6-inches or less of penetration). The SPT "N" values indicate the consistency of the fine grained cohesive clayey silt and silty clay soils vary from very soft to hard, while the relative density of the more granular silty sand soils and non-plastic silt soils vary from loose to very compact.

Some limited zones of deeper soft to very soft clay soil deposits having SPT “N” values of less than 4 or “woh - weight of hammer” (i.e. the sample spoon was advanced with only the weight of the drop hammer and drill rods applied statically to the sample spoon), were encountered in only a few test borings (B-1, B-18, B-20 and B-25). Accordingly, significant deposits of soft to very soft clays, as present in other areas of northern of Amherst, are generally absent within this site. Some soft clay soils were also present in the upper reaches of a few of the test borings (B-8, B-9, B-11, B-19, and B-22).

5.40 BEDROCK

As discussed above, thirty (30) of the test borings were advanced through the overburden until auger refusal (presumed bedrock refusal) was encountered at depths ranging between about 13.5 feet (boring B-10) and 62.5 feet (boring B-1), with corresponding elevations ranging between approximately El. 586.9 feet to El. 543.4 feet. The borings, as well as the depth and elevation where auger refusal (presumed bedrock refusal) was encountered are summarized on Table 2. Within test borings B-7 and B-22 a zone of weathered Shale was encountered before reaching auger refusal.

Bedrock core samples were obtained from test borings B-1, B-4, B-29, B-31, B-43, B-45 and B-47 after reaching auger refusal. Five (5) feet of bedrock was cored at each of these locations. The bedrock core recovered consisted generally of gray, medium hard, sound, thinly bedded to bedded Shale Rock, with occasional partings, seams and layers of gypsum. Within test boring B-31, the recovered shale rock core was described as being partially slightly weathered and laminated.

The shale bedrock recovered is part of the Camillus Shale geologic formation. The core recoveries ranged between 100% and 50%. The rock quality designation (RQD) values ranged between 20% and 82% indicating the recovered rock cores have a varying rock mass quality ranging between “very poor” and “good”.

5.50 GROUNDWATER CONDITIONS

Water level measurements were made in most of the test borings at the completion of overburden drilling and soil sampling. Freestanding water was encountered in borings B-1, B-4, B-5, B-9, B-14, B-20, B-21, B-25, B-26, B-29, B-36, B-37, B-40, B-43, B-45 and B-47 at depths ranging from 13.6 feet to 53.4 feet bgs. These water levels correspond to elevations ranging between El. 586.7 feet and El. 552.5 feet. Each of these borings were advanced to auger refusal (presumed bedrock refusal).

No freestanding water was recorded following the completion of overburden drilling and sampling, at the remaining test borings advanced to auger refusal or at the shallower test borings (i.e. test borings advanced to a depth of 18 to 22 feet and terminated). It is possible that in many cases within the deeper test borings, that groundwater may not have had sufficient time to accumulate and/or stabilize in the boring holes within the time that had elapsed from the completion of soil drilling operations and the time of the observations / measurements.

Following coring at boring locations B-4, B-43 and B-48, freestanding water was recorded at depths of 20.0 feet, 10.0 feet and 10.0 feet respectively below the existing ground surface. These depths correspond to elevations ranging between El. 581.5 feet and El. 583.2 feet. We note that water was added to these test borings to facilitate the rock coring. Water level measurements were not obtained at the completion of coring at the remaining rock core borings (B-1, B-29, B-31 and B-47).

A 2-inch diameter, PVC, groundwater observation well was installed in borings B-6 B-24 and B-48 following the completion of drilling. The wells installed at borings B-24 and B-48 extend to presumed top of bedrock (auger refusal) at depths of 41.3 feet and 31.0 feet, respectively. The well installed at boring B-6 is seated within the silty clay and clayey silt soils at a depth of 22.0 feet.

A geotechnical engineer visited the site on February 7th, February 17th, March 4th, and April 1st, 2014 to record the water level in the wells. The water level depths and corresponding elevations are as follows:

Groundwater Observation Well Water Level Depths and Elevations			
Boring / Well No.	Ground Surface El. (feet)	Water Level Depth (feet)	Water Level El. (feet)
February 7 th , 2014			
B-6	603.1	1.1	602.0
B-24	598.6	30.1	568.5
B-48	595.8	3.6	592.2
February 17 th , 2014			
B-6	603.1	2.1	601.0
B-24	598.6	13.1	585.5
B-48	595.8	4.5	591.3
March 4 th , 2014			
B-6	603.1	4.4	598.7
B-24	598.6	8.1	590.5
B-48	595.8	3.5	592.3
April 1 st , 2014			
B-6	603.1	0.6	602.5
B-24	598.6	8.2	590.4
B-48	595.8	2.4	593.4

The water levels observed and measured in the wells, particularly at boring locations B-6 and B-48, may in part be the result of wet surface conditions or perched water present in the upper soils. Based on the water levels obtained at the completion of coring in borings B-4, B-43 and B-48, as well as the readings obtained in borings B-9, B-20 and B-25 following completion soil sampling to auger refusal, and the level in well B-24 tends to suggest that a permanent groundwater table may be present at elevations in the range of about El 580 feet to El. 589 feet, although this is not confirmed by the other groundwater observation wells at this time. Continued monitoring of the water levels in the existing wells, particularly into the summer months, as well as the installation of additional wells is recommended to better confirm the depths / elevations of permanent groundwater conditions present on the site.

It also appears that zones of perched or trapped groundwater are present in the topsoil and fill soils at or near the ground surface, at various locations on the site, due to the relatively low permeability of the underlying soils present, and depending on site drainage conditions. Such conditions were observed during the subsurface exploration where areas of standing water and spongy surface conditions were present, hindering some of the drill rig access. These conditions can be particularly

more prevalent following heavy or extended periods of precipitation and during seasonally wet periods, and therefore should be anticipated with the new development site preparation. The clayey and silty fill and indigenous soils encountered are considered to be poor draining soils.

6.00 LABORATORY TEST RESULTS

6.10 SHRINKAGE / SWELL POTENTIAL OF CLAY SOILS

A total of thirteen (13) silty clay / clayey silt soil samples, obtained at various locations and depths as summarized on Table 1, were evaluated qualitatively for shrinkage potential using soil shrinkage and moisture content index test data from the laboratory testing program.

The range of moisture content, liquid limit, plastic limit, plasticity index and shrinkage limit of the clay type soil samples tested, were as follows:

Index Property	Range
Moisture Content	10.7 % to 28.1 %
Liquid Limit	20 % to 61 %
Plastic Limit	12 % to 25 %
Plasticity Index	8 to 37
Shrinkage Limit	12 % to 23 %

The plasticity indices indicate the clay soils vary between a low and high plasticity. Based on the moisture contents and the shrinkage test data, the COLE factors determined ranged from 0 to 0.034.

The laboratory test data and COLE factors calculated suggest that the silty clay soils encountered within the upper reaches of the site below the immediate surface soils, (i.e. within the anticipated depths of proposed spread foundations) are partially desiccated and have a generally non-existent to low potential susceptibility to shrinkage. Therefore, spread foundation settlement should generally be limited to normal consolidation settlement as a result of the compressive structural loads.

The following conditions were noted to support these conclusions.

1. The moisture content of the clay soil samples tested were either lower or just slightly above their shrinkage limit.

2. The COLE factors determined generally ranged from 0 to 0.025, with one sample slightly greater at 0.034.

COLE factors of 0 correlate to a non-existent shrinkage potential. COLE factors between 0 and 0.03 correlate to a low shrinkage potential. COLE factors of 0.03 to 0.06 correlate to a moderate shrinkage potential and COLE factors of about 0.06 and greater correlate to a high to very high shrinkage potential.

With regard to potential swelling, the clay soils would have to be in a loose condition and be inundated with water for long periods to cause saturation and potential swelling. Given the relatively medium stiff to hard nature of the indigenous clay soils and their inherent low permeability it is unlikely saturation and potential swelling of these soils would occur in an undisturbed state. We note, however the upper surficial clayey silt /silty clay fill soils are in a less dense condition and may be more susceptible to potential shrinkage and swelling, where they are inundated with poor draining surface water.

In addition, drying and re-wetting cycles occurring in clayey fill soils, if used to backfill the foundation walls, could result in soil swelling/shrinkage cycles that can exert additional lateral pressures acting on earth retaining foundation walls. Such action may cause cracking and distortion of the walls if not properly accounted for. Accordingly, to reduce risks associated with the potential for soil expansion and minimize the potential for additional lateral earth pressures to act on the walls, the backfill against any earth retaining structures (i.e. basement foundation walls, depressed crawl space walls, pit structures, etc.) should consist of a suitable non-plastic soil such as a granular sand and gravel backfill material or a crusher run stone Structural Fill material.

6.20 SOIL CORROSION AND SULFATE ATTACK POTENTIAL

Three (3) composite soil samples were prepared from the samples obtained from the upper reaches of test boring locations B-6, B-34 and B-45. The composite samples were tested for resistivity, redox, pH, and sulfides according to procedures established by the Ductile Iron Pipe Research Association (DIPRA). These samples were also tested for chlorides and sulfates.

This analytical laboratory test data is included in Appendix B and is also summarized in the following tables.

Summary of DIPRA Test Results							
Test Boring	Sample Depth (feet bgs)	Resistivity (ohm-cm)	Redox (mv)	ph	Sulfides	Moisture (%)	Total DIPRA Points
B-6	2 to 8	15,000	-35.2	7.0	Negative	9.5	6
B-34	2 to 10	11,500	-22.6	6.4	Negative	8.9	6
B-45	2 to 10	2,700	9.0	7.6	Negative	23.9	7

Based on the DIPRA publication “American National Standard for Polyethylene Encasement for Ductile Iron Pipe Systems”, if the total DIPRA points exceed 10, the soil is considered corrosive to ductile iron pipe, and protection against exterior corrosion should be provided.

Based on the test results, the site soils tested appear to have a low corrosion potential to ductile iron waterline pipes and other buried metallic pipes/elements. Accordingly, cathodic protection or a suitable protective coating of metallic pipes and conduits, to resist potential corrosion, does not appear necessary.

Summary of Chloride and Sulfate Test Results			
Test Boring	Sample Depth (feet bgs)	Chloride (mg/kg)	Sulfate (mg/kg)
B-6	2 to 8	15	N.D.
B-34	2 to 10	10	N.D.
B-45	2 to 10	18	N.D.

N.D. – Non Detectable within test parameters.

Based on the sulfate concentrations, the soils, which make up these samples, are considered to have a negligible potential for sulfate exposure. Accordingly, a Type I-II Portland Cement appears will be acceptable for the concrete structure elements placed in these soils.

Refer to the laboratory test data included in Appendix B for more information.

7.00 PRELIMINARY GEOTECHNICAL CONSIDERATIONS AND RECOMMENDATIONS FOR SITE DEVELOPMENT

7.10 GENERAL CONSIDERATIONS

The following general considerations and recommendations are provided to assist with the permitting, planning and preliminary design for the proposed mixed use redevelopment project being considered on the site of the Westwood Country Club. This information is based on the recently completed geotechnical investigation, which included 49 test borings completed across the site to characterize the soil and bedrock conditions present, groundwater observations during drilling and from 3 installed wells to assess groundwater conditions present on the site, and laboratory testing to further characterize soil conditions. Additional investigations and further evaluations will be necessary, as discussed below, for final design once final building development plans and loading conditions, along with final site development plans, are established.

Topsoil, along with underlying man-placed fill or disturbed indigenous soils, were encountered at the surface of most of the test boring locations. The topsoil thickness typically ranged between about 2-inches and 14-inches, based on the driller's measurements and interpretation of topsoil. The fill, where present, was typically found to extend to depths ranging between about 2 feet and 5 feet bgs.

The indigenous soils encountered consist predominately of medium stiff to hard silty clay and clayey silt and firm to very compact silty or clayey sand deposits with some intermixed gravel, and occasional cobbles/boulders and shale fragments. These soils are non-organic, and are not considered to be highly compressible, nor highly susceptible to shrinkage, swelling, or liquefaction. Significant deposits of highly moist, soft to very soft clays, as present in other areas of northern Amherst and which have been problematic to residential foundation/structure movement and distress (i.e. basement foundation subsidence / settlement and lateral movement), appear to be generally absent within this site.

Accordingly, the indigenous soil conditions encountered in the test borings are generally considered suitable to support the anticipated residential and mixed use structure loads using conventional spread foundation systems. Spread foundations and any underlying Engineered Fill (i.e. compacted Structural Fill or suitable flowable backfill material), however, will need to bear on suitable indigenous soil

subgrades established below the upper existing man-placed fill and disturbed indigenous soils.

In a few cases (i.e. within borings B-9, B-11, B-19, B-21, B-22 and B-45) some limited zones of weaker soils were encountered which may impact the use of spread foundations from a structure bearing capacity and settlement stand point, particularly if a multiple-story more heavily loaded building structure would be proposed at or near these locations. Accordingly, these conditions possibly may require consideration of deep foundations (i.e. driven piles) for multiple-story more heavily loaded building structures at or near these locations.

The existing fill and indigenous soil subgrades are also considered to be generally suitable for basement, at-grade and garage slab-on-grade floor construction, with proper site preparation. The soils encountered are also considered generally suitable for construction of the proposed infrastructure, including the roadways, parking lots, storm and sanitary sewers, waterlines and retention pond structures.

Based on the water level observations made in the test borings, as well as in the groundwater observation wells, it appears that a permanent general groundwater zone (i.e. groundwater table) should generally not be encountered within the excavations for shallow spread foundations and shallow utility construction. The groundwater observations made during drilling and in well B-24 suggest that a permanent groundwater table may be present at elevations in the range of about El 580 feet to El. 589 feet, although this was not confirmed by all of the groundwater observation wells at this time.

Zones of perched or trapped groundwater are also present in the topsoil and upper fill soils at or near the ground surface, at various locations on the site, due to the relatively low permeability of the underlying soils present, and poor site drainage conditions. These conditions therefore will make site stripping and subgrade preparation difficult, particularly during wet periods.

Given, the relatively low to medium low permeability of the soils present, both permanent and perched groundwater seepage if encountered should be relatively slow and of low quantities. Accordingly, these conditions should not significantly impact basement and utility construction. It is anticipated that conventional sump and pump methods of dewatering should generally be sufficient to control surface water, as well as permanent and perched groundwater seepage conditions, should they be encountered.

Based on the subsurface conditions encountered, the overall site should be classified as Seismic Site Class “D” in accordance with Table 1613.5.2 of the Building Code of New York State - December 2010 (NYS Building Code). As previously stated, the soil conditions encountered are not considered to be susceptible to potential liquefaction in the case of a seismic event. Therefore, seismic design may be based on these criteria.

The following sections present additional and more detailed geotechnical considerations and recommendations to assist with permitting, planning, and preliminary design of the proposed site redevelopment project.

7.20 FOUNDATION SUPPORT

As stated above, the indigenous soil conditions encountered in the test borings are generally considered suitable to support the anticipated residential and mixed use structures using conventional spread foundation systems. Preliminarily, it is expected that spread foundations can be sized, based on net allowable bearing capacities in the range of about 2,000 to 4,000 pounds per square foot (psf) ±, depending on location, foundation bearing depths and actual structure loads.

Spread foundations should bear on suitable, undisturbed, indigenous soil bearing grades, after the removal of all fill soils and any unsuitable indigenous soft or wet soils. Alternatively, the foundations may also bear on Engineered Fill (i.e. compacted Structural Fill or flowable backfill), which is placed over the suitable indigenous soil bearing grades, following excavation and removal of fill soils and any unsuitable indigenous soils which are present below the design bearing grade elevation of the footings.

Suitable indigenous soil bearing subgrades should consist of stiff to hard silty clay and clayey silt soils or firm to very compact silty or clayey sand soils. Suitable bearing subgrade conditions were typically encountered in the test borings at depths ranging between about 2 feet and 5 feet bgs. At boring locations B-19 and B-22 suitable bearing subgrade conditions were deeper at about 10 feet and 6.5 feet, respectively.

In a few cases (i.e. within borings B-9, B-11, B-19, B-21, B-22 and B-45) zones of weaker soils were encountered which may impact the use of spread foundations. Accordingly, these conditions possibly may require consideration of a deep foundation system; particularly if multiple-story more heavily loaded building structures would be proposed at or near these locations.

Driven H-piles or pipe piles driven to refusal on the Shale bedrock appear would be the best suited deep foundation system option for the site conditions present. Zones of gypsum present in the Shale bedrock may require socketting of drilled piers in the bedrock in order to bear the piers on suitable bedrock below these zones. Therefore, it appears the use of drilled piers would be less favorable from both a constructability and economic standpoint.

For preliminary information, a driven HP12x53 H-pile, driven to refusal on the bedrock, would be expected to develop an axial compressive capacity in the range of about 100 to 120 tons \pm per pile. Other pile sections can also be used, based on product availability and costs, which would provide higher or lower allowable axial capacities, based on the actual pile section.

7.30 BASEMENT STRUCTURE DESIGN CONSIDERATIONS

Basement structures should be designed for lateral earth pressures caused by the load of backfill against the wall and the surcharge effects from any permanent or temporary loads. In addition suitable foundation drainage should be provided to relieve potential hydrostatic pressure from developing against the basement walls and floors due to the possible presence of groundwater. In this case suitable damp proofing of the walls and floors should also be provided. Alternatively, the basement structures could also be designed to resist potential full hydrostatic pressure. In such case the basement structure should also be fully water proofed.

Where suitable foundation drainage is provided, the basement walls can be designed for “at rest” lateral earth pressure computed on the basis of an “equivalent fluid unit weight” of 70 pounds per cubic foot (pcf). This is based on the assumption that the wall backfill beyond the drainage system is a suitable well draining granular backfill material, such as a crusher run stone Structural Fill.

The use of the on-site clayey silt, silty clay and silty or clayey sand soils to backfill the basement walls is not recommended as they will be susceptible to potential swelling in a looser disturbed state, which could cause additional lateral pressures on the basement walls. The on-site soils could be used, however, to backfill non-earth retaining foundation walls provided they can be properly placed and compacted to a stable and well engineered condition.

The foundation drainage system should be properly designed, installed and maintained for long-term performance and should drain to a sump and pump system or a gravity drain relief point, which is not susceptible to potential backup.

The foundation drainage system should include a drainage/separation geotextile installed around drainage stone, which surrounds a slotted under-drain pipe. The drainage stone should be sized in accordance with the pipe slotting. A crushed aggregate conforming to NYSDOT Standard Specifications Section 703-02, Size Designation No. 1 (½-inch washed gravel or stone) is generally acceptable for slotted under-drain pipe. The foundation under-drain pipes should be set at a depth of about 1 foot below the top of the finish basement floor grade.

A pervious granular backfill (i.e. concrete sand or crusher run stone) or a suitable geosynthetic drainage composite (i.e. Miradrain, Grace Hydroduct, Delta MS, etc.) should be placed against the basement foundation wall, above the drainage system, to allow infiltration to the drainage system.

7.40 SLAB-ON-GRADE FLOOR CONSTRUCTION

The building floors can be constructed as slab-on-grade following proper subgrade preparation as outlined in Section 7.80. For preliminary design purposes, a minimum of 6-inches of Subbase Stone is recommended beneath the lightly loaded floor slabs (residential floors, lightly loaded office floors, etc.). A minimum 12-inch thick layer of Subbase Stone is recommended beneath more heavily loaded floor slabs (i.e. garage areas, storage areas, mechanical rooms, etc.). A suitable stabilization/separation geotextile, such as Mirafi 500X, should be placed over the existing soil or fill soil subgrades prior to placement of the Subbase Stone layer.

An imported suitable granular fill material is generally recommended to be used as subgrade fill to raise the site grades, beneath the Subbase Stone course for the slab-on-grade construction. The use of the soils from the site may be possible for the building pad site filling, provided the soil can be properly placed and compacted in a controlled manner, as discussed further in Section 7.80 below.

In order to limit potential post construction settlement, due to required site filling, we recommend the subgrade fill placement, in areas requiring more than about 2 to 3 feet of fill, be completed at least 1 to 2 months in advance of the final subgrade preparation, Subbase Stone placement, and floor slab construction.

Preliminarily, the slab-on-grade floor slabs may be designed using a modulus of subgrade reaction of 150 pounds per cubic inch (pci) at the top of the subbase layer. It is recommended that the slab-on-grade be constructed such that it is not structurally connected to, or resting directly on, perimeter walls or column footings in order to limit differential settlement effects.

The above subbase stone thicknesses should not be considered sufficient for carrying construction vehicle loads. Therefore, contingencies should be planned for to temporarily increase the Subbase Stone thickness within the building pad areas to provide a suitable working surfaces to stage the construction, carry construction vehicle loads and protect the underlying subgrades. This will be particularly important when wet periods occur. The additional subbase stone material could then be removed and re-graded in preparation for the actual floor construction and/or re-used as foundation backfill or as pavement area subbase or as otherwise determined appropriate.

A moisture barrier is generally not considered warranted where the floor slabs are constructed at or above the final site grades, unless otherwise recommended by the finished flooring manufacturer. A suitable moisture barrier, however, is recommended beneath the below grade floor areas (i.e. basement areas) to reduce the potential for dampness.

7.50 SEISMIC DESIGN CONSIDERATIONS

Based on the subsurface conditions encountered in the test borings, the upper 100 feet of the site should be classified as Seismic Site Class “D” in accordance with the criteria presented on Table 1613.5.2 of the Building Code of New York State - December 2010 (NYS Building Code). The soil conditions encountered are generally not considered to be susceptible to potential liquefaction in the case of a seismic event. Therefore, seismic design may proceed based on these considerations.

The spectral response accelerations in the project area were obtained by Empire using the United States Geological Survey (USGS) web site application (<https://geohazards.usgs.gov/secure/designmaps/us/>). These accelerations were then adjusted, as recommended by the USGS, to obtain the 2% probability in 50 years mapping accelerations, as presented in the NYS Building Code.

Using the site location, the calculated spectral response accelerations for Site Class “B” soils are 0.221g for the short period (0.2 second) response (S_s) and 0.051g for the one second response. These spectral response accelerations were then adjusted for the Seismic Site Class “D” soil profile determined for the project site.

Accordingly, the adjusted spectral response accelerations for Site Class “D” are as follows:

- Short Period Response (S_{MS}) - 0.354g
- 1 Second Period Response (S_{M1}) - 0.122g

The corresponding five percent damped design spectral response accelerations (S_{DS} and S_{D1}) are as follows:

- S_{DS} - 0.236g
- S_{D1} - 0.081g

It is possible that a seismic shear wave velocity study of the site may refine and possibly upgrade the seismic design site class. This may be particularly beneficial in the areas of the mixed use commercial and apartment buildings depending on the costs associated with seismic reinforcement of these structures. It should be understood, however, that there is no guarantee that an upgrade can be made if a seismic shear wave study is performed,

7.60 PAVEMENT DESIGN CONSIDERATIONS

The Town of Amherst requires a typical pavement section consisting of the following components for residential and commercial development roadways:

Town of Amherst Asphalt Concrete Pavement Section:

- 1.5 inches – Top Course
- 2.5 inches – Binder Course
- 4.0 inches – Base Course
- 11 inches – Subbase Stone Course

It is estimated that the existing subgrade soils will have a typical CBR value of about 2 to 3 ±. This correlates to a soil resilient modulus of about 3,500 psi, which has been used for our pavement design evaluations. The pavement sections were analyzed using the NYS DOT Thickness Design Manual for New and Reconstructed Pavement, along with the American Association of State Highway and Transportation Officials (AASHTO) “Interim Guide Method for Design of Flexible Pavements”.

Based on our analyses, the Town of Amherst pavement section will provide approximately 1.2 million, 18-kip equivalent axle loads (EAL’s) over its design life, provided the subgrades are prepared in accordance with the recommendations

presented in Section 7.80. This design life is considered to be within an acceptable range for this type of application.

We would recommend, however, the Town of Amherst pavement section also include a suitable stabilization/separation geotextile (i.e. Mirafi 600X or suitable equivalent). It may also be necessary to increase the subbase thickness in some areas to improve subgrade conditions in some areas, as well as to promote drainage to underdrains, etc. as discussed below.

Pavement design recommendations are also provided for two (2) flexible pavement structure types within the proposed mixed use development areas. These include the following:

- A heavy duty asphalt concrete pavement for the entrance, access drives and pavement areas, which will be subject to delivery truck traffic. (Heavy Duty Asphalt Concrete Pavement Structure); and
- A light duty asphalt concrete pavement for automobile / light SUV only parking areas (Light Duty Asphalt Concrete Pavement Structure).

Heavy Duty Asphalt Concrete Pavement:

- 1.5 inches – Top Course
- 3.0 inches – Binder Course
- 15 inches – Subbase Stone Course
- Stabilization/Separation Geotextile
- Prepared Subgrade

Light Duty Asphalt Concrete Pavement:

- 1.5 inches – Top Course
- 2.0 inches – Binder Course
- 10 inches – Subbase Stone Course
- Stabilization/Separation Geotextile
- Prepared Subgrade

Based on our analyses, the Heavy Duty and Light Duty pavement sections will provide approximately 350,000 and 45,000 18-kip equivalent axle loads (EAL's), respectively, over their design life.

The installation of underdrains and/or edge drains is recommended to drain the pavement subbase course and subgrades in order to limit the potential for frost action and improve pavement structure performance and design life. Alternatively, the pavement subbase course can also be allowed to daylight/drain to an adjacent perimeter drainage swale.

Proper grading of the pavement structure subgrades is also recommended. Accumulation of water on pavement subgrades should be avoided by grading the subgrade to a slope of at least 2 percent to allow drainage to the underdrains or drainage swale.

The subbase stone course for the above pavement sections should not be considered sufficient for use as construction haul roads. Therefore, contingencies should be planned for to temporarily increase the Subbase Stone thickness or provide additional base stabilization / reinforcement within the areas that will be used as construction roads and to stage the construction.

7.70 UNDERGROUND UTILITY CONSTRUCTION

The generally medium stiff to hard clayey silt and silty clay and firm to very compact silty or clayey soils should provide generally suitable subgrade conditions for underground utility construction, including storm and sanitary sewers, water lines, gas lines and buried electrical / communication conduits. Accordingly, standard bedding materials and thicknesses can generally be used to support this infrastructure. It should be expected, however, that in some localized cases that subgrade undercuts and the placement of additional bedding material or subgrade stabilizing materials may be required to provide suitable and stable subgrades for the utility construction. Therefore, some contingencies should be planned for, should such localized conditions be encountered.

7.80 SUBGRADE PREPARATION FOR PAVEMENT AND SLAB-ON-GRADE CONSTRUCTION

The site preparation work should be performed during seasonal dry periods to minimize potential degradation of the subgrade soils and potential undercuts which may be required to establish a stable base for construction. It should be understood that the indigenous subgrade soils that will be exposed are sensitive and will degrade and lose strength when they are wet and disturbed by construction equipment traffic. Accordingly, efforts should be made to maintain the subgrades in a dry and stable condition at all times, and not permit excessive or heavy construction traffic directly over these soils.

It is noted that zones of perched or trapped groundwater are present in the topsoil and upper fill soils at or near the ground surface, at various locations on the site, due to the relatively low permeability of the underlying soils and poor site drainage conditions present. Such conditions occurred during the subsurface exploration where areas of standing water and spongy surface conditions were present, hindering some of the drill rig access, until the site became frozen in the later part of January and early February. These conditions therefore will make site stripping and subgrade preparation difficult, particularly during wet periods, and therefore should be anticipated.

Measures to improve site drainage should be implemented as necessary prior to commencing the site stripping and subgrade preparation work. Such measures, may include installation of drainage swales to intercept and divert surface runoff away from the construction areas, sloping of the subgrade and “sealing” of the surface with a smooth drum roller to promote runoff, and restricting construction equipment traffic from traveling directly over the subgrade surfaces, especially when they are wet. The placement of a suitable base material and underlying stabilization geotextile, beneath haul roads, and in construction staging areas, will help to protect the subgrades and minimize problems associated with subgrade degradation.

All existing structures, trees, stumps, vegetation, topsoil, organic soils, etc., and any other deleterious materials within the proposed building pad areas and pavement areas should be removed. Following stripping and removal of the surface materials (i.e. topsoil, asphalt pavement, concrete pads and structures, etc.), the exposed subgrades should be proof-rolled. The proof-rolling should be performed, prior to the overlying fill placement, using a smooth drum roller weighing at least 10 tons.

The subgrade proof-rolling should be done under the guidance of, and observed by qualified geotechnical engineering personnel. In some cases it may be necessary to waive the proof-rolling requirement if wet subgrades are present. This should be determined by the geotechnical engineer (i.e. Empire). Any undercuts, which may be required as the result of the proof-rolling, should be performed based on guidance and evaluation of the conditions by the geotechnical engineer. Resulting undercuts should be backfilled with a suitable material as recommended by the geotechnical engineer.

The placement of an initial lift of suitable oversized stone fill material (i.e. “surge stone”, “shot rock”, minus 6-inch crusher run stone, No.3 & No.4 Stone, etc.) encased in stabilization geotextile top and bottom, may be necessary in some cases

to help stabilize the subgrades prior to the subgrade fill placement, particularly if the existing subgrades are in a soft/wet condition.

The subgrade fill placement necessary to raise the site grades may proceed following preparation and acceptance of the existing soil subgrades.

The majority of the site filling and grading necessary to raise site grades should be performed sufficiently in advance of the foundation, pavement and utility construction. Therefore we recommend the subgrade fill placement, in areas requiring more than about 2 to 3 feet of fill, be completed at least 1 to 2 months in advance of the final subgrade preparation and subbase stone placement for floor slab and pavement construction.

The on-site soils could be used for constructing the fills for establishing the building pad and pavement areas, provided they can be properly placed and compacted in a controlled manner and to a stable well engineered condition, in accordance with our recommendations. It should be understood, however, that these soils will be very difficult to dry and work with. Therefore the use of imported granular fill materials will be better suited for building pad, roadway and parking lot fill areas. On-site soils used for filling within the building pad area and pavement areas must be free of all organics, and any soft, wet or otherwise deleterious material.

As stated above, the use of the fine grained on-site soils for site filling will be difficult to work with (i.e. dry for proper compaction), vs. an imported Suitable Granular Fill or Structural Fill material, particularly during seasonally inclement or wet weather. Efforts should be made to maintain the subgrades in a dry and stable condition at all times, and limit construction traffic directly over these soils, particularly if they become wet.

Subgrade fill placed to establish the building pad, roadway and parking lot areas, using the on-site soil material, should be compacted to a minimum of 95 percent of the maximum dry density as measured by the modified Proctor moisture-density relationship (ASTM D 1557). The subgrade fill should be placed in horizontal lifts that do not exceed a maximum loose lift thickness of 6 to 9 inches. The loose lift thickness should be reduced in conjunction with the compaction equipment used so that the required density is attained. On-site soil used for subgrade fill should have a moisture content within -3% to $+1\%$ of the optimum moisture content (determined by ASTM D 1557) when it is placed and compacted. On-site soils having moisture contents exceeding this range will require drying efforts to be implemented by the contractor.

The subgrade fill should be placed to a stable condition and should not “pump” or show signs of movement or significant deflection (i.e. unstable conditions) as it is being constructed. Any unsuitable conditions should be undercut and removed. The fill subgrades should also be properly graded, drained and protected from moisture and frost. Placement of fill over wet, soft, snow covered or frozen subgrades should not be permitted.

Suitable Granular Fill or Structural Fill as described below in Section 7.90, or other imported suitable granular soil materials are recommended as better suited for subgrade fill to raise the existing site grades for slab-on-grade and pavement construction. Empire, however, should be consulted regarding the acceptability of any off-site materials, which do not meet the requirements stated below for Suitable Granular Fill or Structural Fill. All fill placement and compaction should be closely monitored and tested on a “full-time” basis by qualified geotechnical engineering personnel.

7.90 STRUCTURAL FILL AND SUITABLE GRANULAR FILL MATERIALS

Structural Fill Material

Structural Fill (Subbase Stone) should consist of crusher run stone, which is free of clay, organics and friable or deleterious particles. The crusher stone should meet the requirements of New York State Department of Transportation, Standard Specifications, Item 304.12 – Type 2 Subbase, with the following gradation requirements.

<u>Sieve Size Distribution</u>	<u>Percent Finer by Weight</u>
2 inch	100
¼ inch	25-60
No. 40	5-40
No. 200	0-10

Suitable Granular Fill

Suitable Granular Fill should be well graded from coarse to fine and classified as GW, GP, GM, SW, SP and SM soils using the Unified Soil Classification System (ASTM D-2487). It should have no more than 85- percent by weight material passing the No. 4 sieve, no more than 20- percent by weight material passing the No. 200 sieve and should be generally free of particles greater than 4-inches. It should also be

free of topsoil, asphalt, concrete rubble, wood, debris, clay and other deleterious materials.

Material meeting the requirements of New York State Department of Transportation, Standard Specifications, Item 203.07 – Select Granular Fill is acceptable for use as Suitable Granular Fill.

Placement and Compaction

Structural Fill and Suitable Granular Fill should be compacted to a minimum of 95 percent of the maximum dry density as measured by the modified Proctor test (ASTM D1557). Placement of the fill should not exceed a maximum loose lift thickness of 6 to 9 inches, with the exception of the subbase course beneath the slab-on-grade and pavement construction, which can be placed in a single lift not exceeding 15-inches. It may be necessary to reduce the loose lift thickness depending on the type of compaction equipment used so that the required density is attained. The fill should have a moisture content within two percent of the optimum moisture content at the time of compaction.

8.00 RECOMMENDATIONS FOR ADDITIONAL GEOTECHNICAL INVESTIGATIONS

As discussed above, it is recommended that additional explorations be completed for final site redevelopment design particularly in the mixed use town center and future senior housing building development areas

Preliminarily we would recommend that additional test borings in the mixed use town center and senior housing building development areas be performed to provide an approximate frequency of at least one (1) boring per about 3,000 to 4,000 square feet of building footprint, with no less than 4 borings per building. The recommended depth of these borings will be dependent on the building structure loads and foundation bearing depths. At least half of these borings, however, should be extended to bedrock, if a deep foundation system appears may be warranted.

Additional borings within the proposed residential areas should be made to provide a frequency of about one (1) boring per 4 to 5 residential units, with these borings extending to a depth of about 20 feet ±. Additional borings along the proposed roadway and parking lot areas should be made to provide a frequency of about one (1) boring per 400 linear feet of road and/or about one (1) boring per about 10,000 square feet of parking lot area. The roadway borings should extend at least 5 feet

beneath the anticipated utility inverts and the parking lot area borings should extend to a depth of about 6 feet.

Empire can be consulted to assist in planning the locations and scope of the additional explorations and evaluations that may be necessary for final design, based on the final development plans, building sizes and loads.

9.00 CONCLUDING REMARKS

This report was prepared to assist in evaluating the geotechnical characteristics of the subsurface conditions present at the Westwood Country Club site in Amherst, New York, with regard to the proposed mixed use redevelopment project being considered on the site. The report has been prepared for the exclusive use of Mensch Capital Partners, LLC and related parties, for specific application to this site and this project only.

The considerations and preliminary recommendations presented were prepared based on Empire Geo-Services, Inc.'s understanding of the proposed site redevelopment, as described herein, and through the application of generally accepted soils and foundation engineering practices. No warranties, expressed or implied are made by the conclusions, opinions, recommendations or services provided.

This report was prepared for site characterization and preliminary site development planning purposes only. It should not be considered as providing complete or sufficient subsurface information for final building foundation design and construction. Additional subsurface explorations and geotechnical engineering evaluations will be necessary based on the actual planned site development, including the building sizes, location, use and structural loads.

Additional information regarding the use and interpretation of this report is presented in Appendix D.

Sincerely,

EMPIRE GEO-SERVICES, INC.



John J. Danzer, P.E.
Senior Geotechnical Engineer

TABLES

TABLE 1
SUMMARY OF LABORATORY INDEX TESTS
PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
NORTH FOREST ROAD
AMHERST, NEW YORK

Test Boring Number	Sample Number	Sample Depth	Moisture Content (%)	Grain Size Distribution			Atterberg Limits			COLE Factor	Shrinkage Potential	Soil Description	USCS Group Soil
				Gravel (%)	Sand (%)	Silt & Clay (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index				
B-1	S-3	4' - 6'	14.6	5.2	27.0	67.8	20	12	8	12	Red-Brown Silty Clay / Clayey Silt, some Sand, trace gravel	CL / ML	
B-3	S-4	6' - 8'	14.8	2.0	14.8	83.2	24	13	11	13	Red-Brown Silty Clay, little Sand, trace gravel	CL	
B-7	S-6	10' - 12'	12.6	8.3	17.4	74.3	24	12	12	13	Brown-Gray, Silty Clay, little Sand, Trace gravel	CL	
B-12	S-3	4' - 6'	13.1	8.6	23.2	68.2	24	13	11	12	Red-Brown Silty Clay, some Sand, trace gravel	CL	
B-14	S-4	6' - 8'	10.7	7.9	22.0	70.1	23	12	11	17	Red-Brown Silty Clay, some Sand, trace gravel	CL	
B-20	S-5	10' - 12'	23.3	0.0	1.0	99.0	37	17	20	19	Red-Brown Silty Clay, trace sand	CL	
B-22	S-3	4' - 6'	26.5	0.0	0.8	99.2	52	22	30	23	Red-Brown Silty Clay, trace sand	CH	
B-30	S-5	8' - 10'	11.4	4.3	22	72.8					Red-Brown Clayey Silt, some Sand, trace gravel	ML	
B-31	S-6	10' - 12'	10.7	9.1	21.6	69.3	23	13	10	12	Orange-Brown Silty Clay, some Sand, trace gravel	CL	
B-35	S-7	15' - 17'	8.7	11.8	29.4	58.8					Red-Brown Clayey Silt, some Sand, little Gravel	ML	
B-38	S-2	2' - 4'	21.3	0.0	3.8	96.2	44	20	24	20	Brown Silty Clay, trace sand	CL	
B-40	S-4	6' - 8'	12.0	2.2	14.8	83	25	14	11	13	Red-Brown Silty Clay, little Sand, trace gravel	CL	
B-44	S-3	4' - 6'	21.3	0.0	2.2	97.8	59	22	37	22	Red-Brown Silty Clay, trace sand	CH	
B-46	S-3	4' - 6'	28.1	0.0	0.8	99.2	61	25	36	22	Red-Brown Silty Clay, trace sand	CH	
B-48	S-5	8' - 10'	11.8	3.8	19.1	77.1	23	13	10	14	Red-Brown Silty Clay, little Sand, trace gravel	CL	
COMPOSITE SAMPLES													
DIPRA Points Chlorides / Sulfates (ppm)													
B-6	S-2 to S-4	2' - 8'	4.5 to 11.3	5.8	14.9	79.3				6	15 / ND	Red-Brown Silty Clay, little Sand, trace gravel	ML / CL
B-34	S-2 to S-5	2' - 10'	5.9 to 12.0	7.8	10.7	81.5				6	10 / ND	Red-Brown Silty Clay, little Sand, trace gravel	ML / CL
B-45	S-2 to S-5	2' - 10'	20.2 to 28.6	4.5	1.7	93.8				7	18 / ND	Red-Brown Silty Clay, trace sand	CL

TABLE 2 (SHEET 1 OF 3)

SUMMARY OF SUBSURFACE CONDITIONS

PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 NORTH FOREST ROAD
 AMHERST, NEW YORK

Boring Number	Ground Surface El. (feet)	Total Boring Depth (feet)	Surface Material	Fill Depth (feet)	Bottom of Fill El. (feet)	Auger Refusal Depth (feet)	Auger Refusal El. (feet)	Depth of Freestanding Water in Boring (feet)	El. of Freestanding Water in Boring (feet)	Depth to Groundwater in Well (feet)	El. of Groundwater in Well (feet)
B-1	605.9	67.5	Topsoil	2.0	603.9	62.5	543.4	53.4	552.5		
B-2	603.7	20.0	12" - Topsoil	2.0	601.7	N.E.	N.E.	N.E.	N.E.		
B-3	603.1	20.0	12" - Topsoil	2.0	601.1	N.E.	N.E.	N.E.	N.E.		
B-4	601.5	53.5	3" - Topsoil	2.0	599.5	48.5	553.0	47.0	554.5		
B-5	603.2	32.7	2" - Topsoil	2.0	601.2	32.7	570.5	16.5	586.7		
B-6 w/Well	603.1	22.0	14" - Topsoil	2.0	601.1	N.E.	N.E.	N.E.	N.E.	0.6	602.5
B-7	603.0	47.6	8" - Topsoil	N.E.	N.E.	47.6	555.4	N.E.	N.E.		
B-8	602.8	47.5	2" - Topsoil	N.E.	N.E.	47.5	555.3	N.E.	N.E.		
B-9	602.4	44.0	3" - Topsoil	2.0	600.4	44.0	558.4	22.0	580.4		
B-10 / 10A	600.4	13.5	3" - Topsoil	2.0	598.4	13.5	586.9	N.E.	N.E.		
B-11	601.7	45.7	4" - Topsoil	2.0	599.7	45.7	556.0	N.E.	N.E.		
B-12	599.1	20.0	4" - Topsoil	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.		
B-13	599.1	21.0	10" - Topsoil	2.0	597.1	N.E.	N.E.	N.E.	N.E.		
B-14	602.9	47.7	10" - Topsoil	2.0	600.9	47.7	555.2	38.2	564.7		
B-15	602.9	20.0	3.5" - Topsoil	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.		
B-16	599.5	20.0	6" - Topsoil	2.0	597.5	N.E.	N.E.	N.E.	N.E.		
B-17	598.2	22.0	Topsoil	2.0	596.2	N.E.	N.E.	N.E.	N.E.		

Orange box: Boring Advanced to Auger Refusal

Yellow box: Boring Scheduled to be Advanced to 20 feet and Terminated

Pink box: Boring Advanced 5 feet into Bedrock with Rock Coring

Blue box: Groundwater Observation Well Installed in Boring. Water Level on April 1st, 2014

N.E. - Not Encountered

N.E.B.C. - Not Encountered Before Boring to Facilitate Rock Coring

N.D. - Not Determined

Empire Geo-Services, Inc.
 5167 South Park Avenue
 Hamburg, New York 14075

TABLE 2 (SHEET 2 OF 3)

SUMMARY OF SUBSURFACE CONDITIONS

PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
NORTH FOREST ROAD
AMHERST, NEW YORK

Boring Number	Ground Surface El. (feet)	Total Boring Depth (feet)	Surface Material	Fill Depth (feet)	Bottom of Fill El. (feet)	Auger Refusal Depth (feet)	Auger Refusal El. (feet)	Depth of Freestanding Water in Boring (feet)	El. of Freestanding Water in Boring (feet)	Depth to Groundwater in Well (feet)	El. of Groundwater in Well (feet)
B-18	588.5	35.0	3" - Topsoil	4.0	584.5	35.0	553.5	N.E.	N.E.		
B-19	592.3	20.0	Topsoil	2.0	590.3	N.E.	N.E.	N.E.	N.E.		
B-20	597.0	43.5	Topsoil	2.0	595.0	43.5	553.5	16.5	580.5		
B-21	598.2	41.5	Native Soil	N.E.	N.E.	41.5	556.7	39.0	559.2		
B-22	599.1	44.1	11" - Topsoil	N.E.	N.E.	44.1	555.0	N.E.	N.E.		
B-23	596.8	22.0	11" - Topsoil	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.		
B-24 w/Well	598.6	41.3	Topsoil	4.0	594.6	41.3	557.3	N.E.	N.E.	8.2	588.6
B-25	594.8	40.2	4" - Topsoil	2.0	592.8	40.2	554.6	13.6	581.2		
B-26	594.1	40.8	Topsoil	2.0	592.1	40.8	553.3	33.5	560.6		
B-27	594.3	22.0	Fill	2.0	592.3	N.E.	N.E.	N.E.	N.E.		
B-28	593.2	20.0	6" - Topsoil	2.0	591.2	N.E.	N.E.	N.E.	N.E.		
B-29	594.5	38.5	3" - Topsoil	2.0	592.5	33.5	561.0	19.3	575.2		
B-30	594.8	20.0	8" - Topsoil	4.0	590.8	N.E.	N.E.	N.E.	N.E.		
B-31	592.5	43.5	6" - Topsoil	N.E.	N.E.	38.5	554.0	N.E.B.C.	N.E.B.C.		
B-32	594.0	30.5	3" - Topsoil	4.0	590.0	30.5	563.5	N.E.	N.E.		
B-33	592.9	20.0	Topsoil	2.0	590.9	N.E.	N.E.	N.E.	N.E.		
B-34	593.4	31.4	12" - Topsoil	2.0	591.4	31.4	562.0	N.E.	N.E.		

Boring Advanced to Refusal

Boring Scheduled to be Advanced to 20 feet and Terminated

Boring Advanced 5 feet into Bedrock with Rock Coring

Groundwater Observation Well Installed in Boring. Water Level on April 1st, 2014.

N.E. - Not Encountered

N.E.B.C. - Not Encountered Before Water Added to Boring to Facilitate Rock Coring

N.D. - Not Determined

Empire Geo-Services, Inc.
5167 South Park Avenue
Hamburg, New York 14075

TABLE 2 (SHEET 3 OF 3)

SUMMARY OF SUBSURFACE CONDITIONS

PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
NORTH FOREST ROAD
AMHERST, NEW YORK

Boring Number	Ground Surface El. (feet)	Total Boring Depth (feet)	Surface Material	Fill Depth (feet)	Bottom of Fill El. (feet)	Auger Refusal Depth (feet)	Auger Refusal El. (feet)	Depth of Freestanding Water in Boring (feet)	El. of Freestanding Water in Boring (feet)	Depth to Groundwater in Well (feet)	El. of Groundwater in Well (feet)
B-35	593.0	32.5	7" - Topsoil	N.E.	N.E.	32.5	560.5	N.E.	N.E.		
B-36	593.3	31.0	3" - Topsoil	2.0	591.3	31.0	562.3	28.0	565.3		
B-37	592.1	22.5	8" - Topsoil	4.0	588.1	22.5	569.6	20.0	572.1		
B-38	592.4	24.0	Fill	2.0	590.4	24.0	568.4	N.E.	N.E.		
B-39	592.0	18.1	4" - Topsoil	2.0	590.0	N.E.	N.E.	N.E.	N.E.		
B-40	588.9	22.0	Topsoil	5.0	583.9	22.0	566.9	19.0	569.9		
B-41	590.3	20.0	3" - Topsoil	2.0	588.3	N.E.	N.E.	N.E.	N.E.		
B-42	601.1	22.0	13" - Topsoil	2.0	599.1	N.E.	N.E.	N.E.	N.E.		
B-43	593.2	35.0	6" - Topsoil	2.0	591.2	30.0	563.2	20.0	573.2		
B-44	592.7	18.7	6" - Topsoil	2.0	590.7	N.E.	N.E.	N.E.	N.E.		
B-45	591.9	29.5	7" - Topsoil	2.0	589.9	24.5	567.4	15.0	576.9		
B-46	591.6	20.0	Topsoil	2.0	589.6	N.E.	N.E.	N.E.	N.E.		
B-47	594.9	39.0	6" - Topsoil	2.0	592.9	34.0	560.9	20.0	574.9		
B-48	595.8	31.0	3" - Topsoil	2.0	593.8	31.0	564.8	N.E.	N.E.	2.4	593.4
B-49	593.5	20.0	5" - Topsoil	2.0	591.5	N.E.	N.E.	N.E.	N.E.		

 Boring Advanced to Refusal

 Boring Scheduled to be Advanced to 20 feet and Terminated

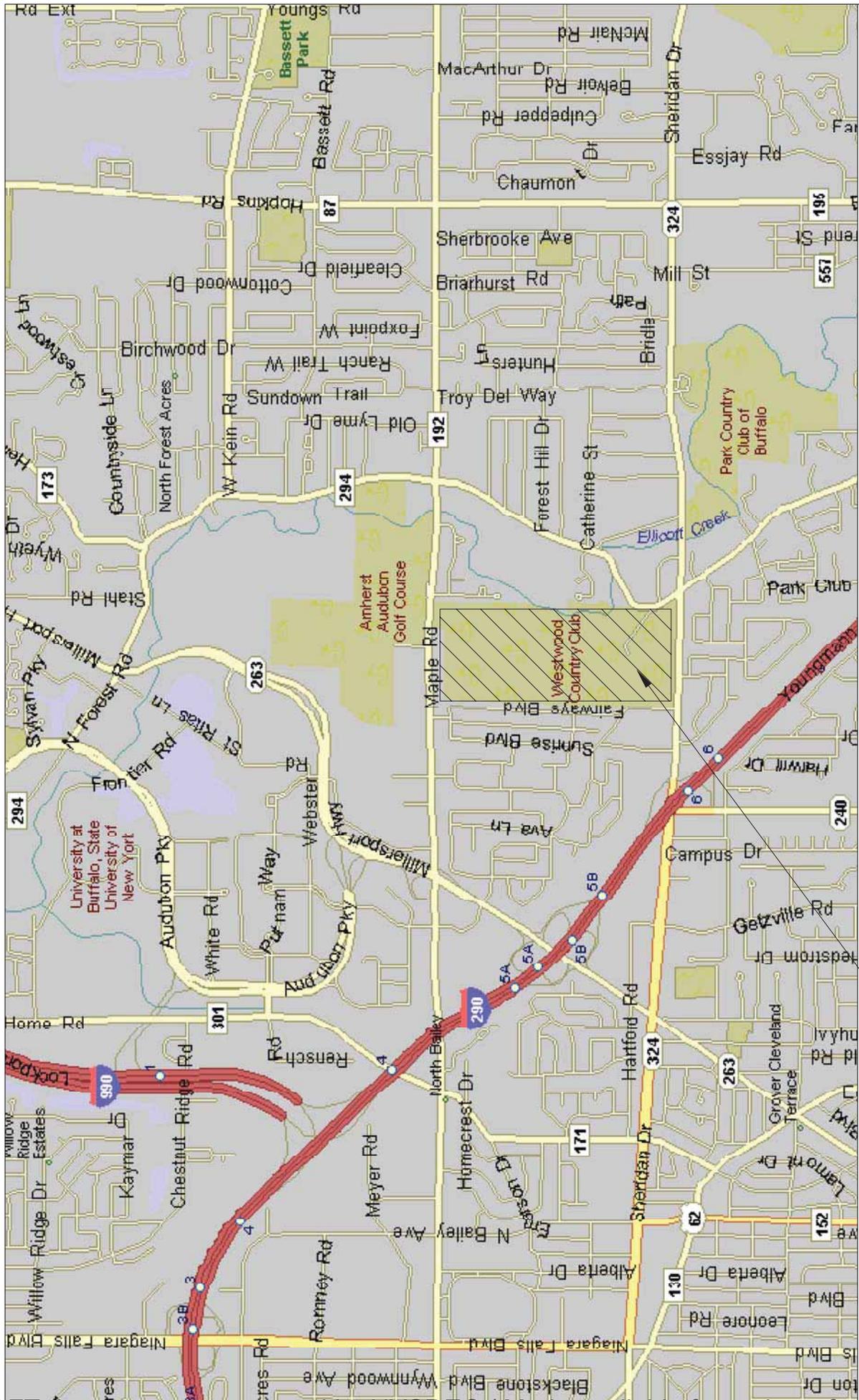
 Boring Advanced 5 feet into Bedrock with Rock Coring

 Groundwater Observation Well Installed in Boring. Water Level on April 1st, 2014.

N.E. - Not Encountered N.E.B.C. - Not Encountered Before Water Added to Boring to Facilitate Rock Coring N.D. - Not Determined

Empire Geo-Services, Inc.
5167 South Park Avenue
Hamburg, New York 14075

FIGURES



APPROXIMATE PROJECT SITE LOCATION

NOTE:
SITE LOCATION PLAN DEVELOPED
FROM MICROSOFT STREETS & TRIPS 2006

PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
NORTH FOREST ROAD
AMHERST, NEW YORK

SITE LOCATION PLAN

DR BY: EDG

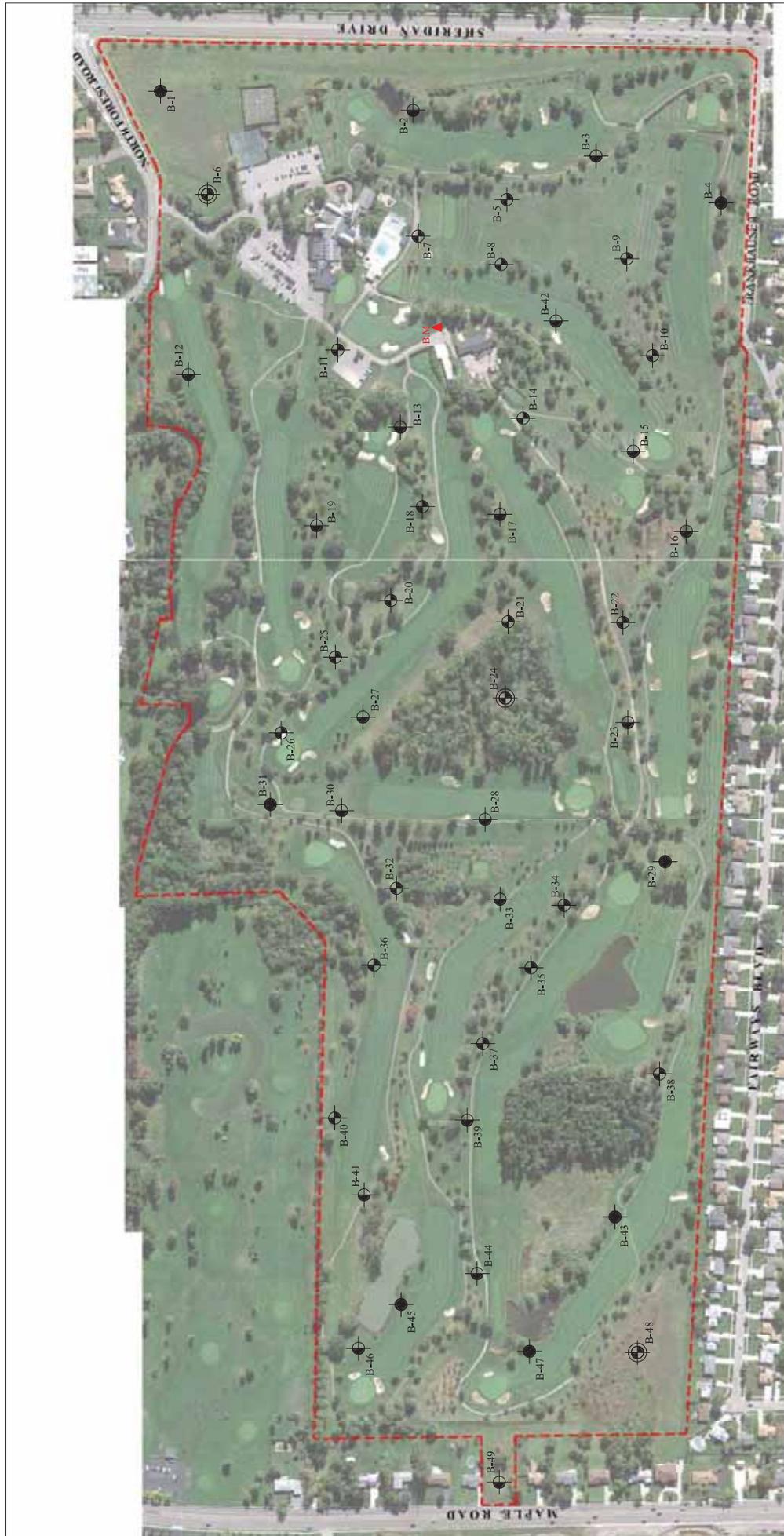
SCALE: NTS

PROJ NO.: BE-13-192

CHKD BY: JJD

DATE: 12/18/13

FIGURE NO: 1



<p>LEGEND:</p> <p>B-5 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING ADVANCED TO AUGER REFUSAL (PRESUMED BEDROCK REFUSAL).</p> <p>B-6 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING ADVANCED TO AUGER REFUSAL, WITH GROUNDWATER OBSERVATION WELL INSTALLATION.</p> <p>B-1 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING ADVANCED TO AUGER REFUSAL, WITH FIVE (5) FEET OF ROCK CORE.</p> <p>B-2 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING PLANNED TO BE ADVANCED TO TWENTY (20) FEET AND TERMINATED.</p>	<p>B.M. APPROXIMATE LOCATION OF BENCHMARK ESTABLISHED BY SHB SERVICES, INC. TOP OF EXISTING ELECTRICAL MANHOLE RIM - BENCHMARK ELEVATION = 602.38 FEET AS ESTABLISHED AND REPORTED BY NUSSBAUMER & CLARKE, INC.</p>		<p>NOTE: FIGURE DEVELOPED FROM DRAWING PROVIDED BY MENSCH CAPITAL PARTNERS, LLC.</p>	
	<p>EMPIRE GEO SERVICES INC a subsidiary of JIB Services, Inc.</p>		<p>PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT NORTH FOREST ROAD AMHERST, NEW YORK</p>	
<p>SUBSURFACE EXPLORATION PLAN EXISTING SITE CONDITIONS</p>		<p>DR BY: EDG</p>	<p>APPROX. SCALE: NTS</p>	<p>DATE: 04/23/14</p>
<p>CHKD BY: JJD</p>		<p>PROJ NO.: BE-13-192</p>		<p>FIGURE NO.: 2</p>



EMPIRE LEGEND:

- B-3 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING ADVANCED TO AUGER REFUSAL (PRESUMED BEDROCK REFUSAL).
- B-4 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING ADVANCED TO AUGER REFUSAL WITH GROUNDWATER OBSERVATION WELL INSTALLATION.
- B-1 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING ADVANCED TO AUGER REFUSAL WITH 5 FEET OF ROCK CORE.
- B-2 INDICATES APPROXIMATE LOCATION AND DESIGNATION OF TEST BORING PLANNED TO BE ADVANCED TO TWENTY (20) FEET AND TERMINATED.

- LEGEND:**
- WESTWOOD COMMONS:**
- A. OFFICE: 200,000 SQ.FT.
 - B. RESIDENTIAL: 72 UNITS
 - C. HOTEL: 280 UNITS
 - D. MULTI-FAMILY: 30 UNITS
 - E. NEGOTIATED BUSINESS SPACE: 15,000 SQ.FT.
 - F. LAKE EDGE TOWNHOMES / MULTI-FAMILY: 37 UNITS
 - G. RIVERS EDGE MULTI-FAMILY APARTMENTS: 56 UNITS
 - H. EVENT SPACE: 2 ACRES
 - I. EXISTING CLUBHOUSE: 2 ACRES
- WESTWOOD RESIDENTIAL:**
- 1. FAVORABLE LOTS: 208 UNITS
 - 2. LARGER LOTS - SINGLE FAMILY: 46 UNITS
 - 3. TOWNHOMES: 90 UNITS
 - 4. SENIOR LIVING FACILITY: ASSISTED LIVING 200 / INDEPENDENT 96

NOTES:

- TOTAL PARKING COUNT IN THE WESTWOOD COMMONS AREA: 2,180 STALLS
- WESTWOOD PARKWAY WIDTH: 80 FT.
- STANDARD ROADWAY WIDTH: 80 FT.

DEMOSIES MEDISTAN TRAILS (G.M.I.)

NOTE:
FIGURE DEVELOPED FROM DRAWING PROVIDED BY MENSCH CAPITAL PARTNERS, LLC.

		PROPOSED WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT NORTH FOREST ROAD AMHERST, NEW YORK	
SUBSURFACE EXPLORATION PLAN PROPOSED SITE DEVELOPMENT	DR. BY: EDG/WMA CHKD BY: JJD	APPROX. SCALE: NTS PROJ. NO.: BR-13-192	DATE: 04/23/14 FIGURE NO.: 3

APPENDIX A
TEST BORING LOGS

DATE
 START 12/3/2013
 FINISH 12/3/2013
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-1
 SURF. ELEV 605.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	WOH	1			TOPSOIL	
		3	6		4	Red-Brown Clayey SILT, tr.-little f-c Sand (moist, FILL)	WOH = Weight of Hammer and Rods
	2	7	9			Red-Brown Silty CLAY / Clayey Silt, some f-c Sand, tr.gravel (moist, v.stiff, CL-ML)	
5	3	5	5			(stiff)	
		7	12		12		
	4	13	23			Contains some-and f-c Sand (hard)	
		36	39		59		
10	5	9	16			Becomes Brown	
		24	32		40		
	6	9	22			Contains tr.-little f-c Gravel	
		26	32		48		
15							
	7	8	13			Becomes Brown-Gray	
		18	22		31		
20							
	8	6	10			(v.stiff)	
		13	19		23		
25							
	9	8	10				
		13	18		23		
30							
	10	7	10				
		14	19		24		
35							
	11	6	7				
		9	15		16		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. KOSKE DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/3/2013
 FINISH 12/3/2013
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-1
 SURF. ELEV 605.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
42	12	7	7			(stiff)	
		8	12		15		
45	13	3	3			Brown-Gray Silty CLAY, tr.sand (moist-wet, medium, CL)	
		3	4		6		
50	14	1	2			Becomes Red-Brown (soft)	
		1	2		3		
55	15	3	1				
		4	6		5		
60	16	50/0.1				Gray SHALE Rock, medium hard, sound, bedded.	REF = Sample Spoon Refusal NQ '2' Size Rock Core
					REF		
65						Boring Complete at 67.5'	RUN #1: 62.5' - 67.5' REC = 96% RQD = 82%
70							Free standing water recorded at 53.4' prior to coring.
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. KOSKE DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/17/2013
 FINISH 12/17/2013
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-3
 SURF. ELEV 603.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	1			TOPSOIL	Driller notes approx. 12" Topsoil
		2	3		3	Red-Brown and Black Silty CLAY, tr.sand (moist, FILL)	
5	2	5	6			Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		6	9		12		
	3	7	8			(v.stiff)	
		8	11		16		
10	4	10	12			Becomes Brown-Gray, contains little f-c Sand, tr.gravel	
		11	14		23		
	5	10	12			Contains tr.boulder fragments (hard)	
		14	17		26		
	6	15	17	50/0.3	REF	REF = Sample Spoon Refusal	
15	7	12	11			(v.stiff)	
		15	14		26		
20	8	15	10			No Recovery Sample #8	
		12	16		22		
25						Boring Complete at 22.0'	No free standing water encountered at boring completion.

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/28/2014
 FINISH 1/30/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-4
 SURF. ELEV 601.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	2	3			TOPSOIL	Driller notes approx. 3" Topsoil
		5	5		8	Red-Brown and Black Silty CLAY, tr.sand, tr.organics (moist, FILL)	
	2	4	3			Red-Brown Silty CLAY, tr.sand (moist, medium, CL)	
		4	6		7		
5	3	5	6			Brown Clayey SILT, tr.-little f-c Sand (moist, stiff, ML)	
		7	9		13		
	4	5	8			(v.stiff)	
		10	14		18		
	5	16	23			(hard)	
10		19	21		42		
	6	12	21				
		25	26		46		
15							
	7	5	9			Brown-Gray Silty CLAY, little-some f-c Sand, tr.gravel (moist, v.stiff, CL)	
		11	13		20		
20							
	8	6	10			Brown-Gray Clayey SILT, little f-c Sand (moist, v.stiff, ML)	
		13	19		23		
25							
	9	5	7				
		10	17		17		
30							
	10	5	6			Contains some f-c Sand, tr.-little f-c Gravel	
		12	14		18		
35							
	11	4	8				
		14	16		22		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/28/2014
 FINISH 1/30/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-4
 SURF. ELEV 601.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
45	12	6	10				
		13	15		23		
50	13	8	14			Gray-Brown f-m SAND, some-and Silt, tr.-little f-c Gravel (moist, compact, SM)	NQ '2' Size Rock Core
		26	37		40		
55						Gray SHALE Rock, medium hard, sound, thinly bedded to bedded, numerous gypsum partings and seams.	RUN #1: 48.5' - 53.5' REC = 75% RQD = 40% 1
60						Boring Complete at 53.5'	Free standing water recorded at 47.0' prior to coring. Free standing water recorded at 20.0' after coring.
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/15/2014
 FINISH 1/15/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-5
 SURF. ELEV 603.2' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	3			TOPSOIL	Driller notes approx. 2" Topsoil
		6	7		9	Brown-Black Clayey SILT, tr.sand, tr.organics (moist-wet, FILL)	
	2	5	6			Red-Brown Silty CLAY, tr.sand (moist-wet, stiff, CL)	
		7	8		13	Becomes Brown (v.stiff)	
10	3	7	9				No Recovery Sample #7
		11	15		20	Contains occasional Silt seams (hard)	
	4	14	17			Red-Brown Clayey SILT, little-some f-c Sand, tr.gravel (moist, stiff, ML)	
		19	15		36	(v.stiff)	
15	5	4	8				Becomes Brown-Gray, contains some f-c Sand
		6	7		14		
	6	11	12				
		10	12		22		
20	7	24	11				Brown-Gray Silty CLAY, little f-c Sand, tr.gravel (moist, hard, CL)
		12	7		23		
	8	15	11				
		10	18		21		
25	9	15	17				Brown-Gray Clayey SILT, some f-c Sand, tr.gravel (moist, hard, ML)
		21	24		38		
	10	15	18				
		50	50/0.4		68		
30							Boring Complete with Sample Spoon Refusal at 31.9' and Auger Refusal at 32.7'
35							Free standing water recovery at 16.5' at boring completion.
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START <u>12/5/2013</u> FINISH <u>12/5/2013</u> SHEET <u>1</u> OF <u>1</u>	SJB SERVICES, INC. SUBSURFACE LOG	HOLE NO. <u>B-6</u> SURF. ELEV <u>603.1' ±</u> G.W. DEPTH <u>See Notes</u>
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PROJECT: <u>PROPOSED IMPROVEMENTS</u>	LOCATION: <u>WESTWOOD COUNTRY CLUB</u>
PROJ. NO.: <u>BE-13-192</u>	<u>AMHERST, NEW YORK</u>

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
0	1	1	2			TOPSOIL	Driller notes approx. 14" Topsoil
		1	2		3	Red-Brown Clayey SILT, little f-c Sand (moist, FILL)	
1	2	3	2			Red-Brown Silty CLAY, tr.sand (moist, medium, CL)	
		4	4		6		
5	3	4	5			Red-Brown Clayey SILT, tr.-little f-c Sand (moist, stiff, ML)	
		6	8		11		
10	4	7	9			(v.stiff)	
		11	12		20		
15	5	6	7			(stiff)	
		6	9		13		
20	6	7	8				
		7	11		15		
25	7	4	4			Brown-Gray Silty CLAY and f-c Sand, tr.gravel (moist, stiff, CL)	
		5	7		9		
30	8	8	8			Brown-Gray Clayey SILT and f-c Sand, tr.gravel (moist, v.stiff, ML)	No free standing water noted at boring completion
		11	12		19		
35						Boring Complete at 22.0'	2" PVC Groundwater Observation Well installed at boring completion. Refer to installation log for details.
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW DRILLER: <u>T. FARRELL</u> METHOD OF INVESTIGATION <u>ASTM D-1586 USING HOLLOW STEM AUGERS</u>	DRILL RIG TYPE : <u>CME-550X</u>	CLASSIFIED BY: <u>Geologist</u>
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MONITORING WELL COMPLETION RECORD



WELL NUMBER: B-6	
PROJECT NAME: WESTWOOD CC	DRILLING METHOD: HOLLOW STEM AUGERS
PROJECT NUMBER: BE-13-192	GEOLOGIST: N/A
DRILLER: T. FARRELL	INSTALLATION DATE(S): 12/5/2013



TYPE OF SURFACE SEAL:	CONCRETE PAD WITH
	FLUSH MOUNT SURFACE
	CASING
TYPE OF BACKFILL:	AUGER CUTTINGS
BOREHOLE DIAMETER:	8" ±
I.D. OF RISER PIPE:	2.0"
TYPE OF RISER PIPE:	PVC
DEPTH OF SEAL:	5.0' El. 598.1' ±
TYPE OF SEAL:	BENTONITE CHIPS
DEPTH OF SAND PACK:	8.0' El. 595.1' ±
DEPTH OF TOP OF SCREEN:	10.0' El. 593.1' ±
TYPE OF SCREEN:	PVC
SLOT SIZE X LENGTH:	.010 X 10.0"
I.D. OF SCREEN:	2.0"
TYPE OF SAND PACK:	MORIE "O" FILTER SAND
DEPTH BOTTOM OF SCREEN:	20.0' El. 583.1' ±
DEPTH BOTTOM OF SAND PACK:	20.0' El. 583.1' ±
TYPE OF BACKFILL BELOW OBSERVATION WELL:	FILTER SAND
ELEVATION/ DEPTH OF HOLE:	22.0' El. 581.1' ±

DATE
 START 12/12/2013
 FINISH 12/12/2013
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-7
 SURF. ELEV 603.0' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	4	2			TOPSOIL	Driller notes approx. 8" Topsoil
		3	2		5	Brown Silty CLAY, tr.sand (moist, medium, CL)	
5	2	3	3				
		3	5		6		
5	3	7	11			Red-Brown Clayey SILT, little f-c Sand, tr.gravel, tr.boulder fragments (moist, v.stiff, ML)	
		13	10		24		
10	4	10	8			(stiff)	
		5	5		13		
10	5	7	8			Becomes Brown	
		7	11		15		
15	6	8	9			Brown-Gray Silty CLAY, tr.-little f-c Sand, tr.gravel (moist-wet, v.stiff, CL)	
		13	15		22		
20	7	7	4			(stiff)	
		6	7		10		
25	8	6	5				No Recovery Sample #8
		7	6		12		
30	9	6	8			Brown-Gray Clayey SILT, little-some, f-c Sand, tr.gravel (moist, v.stiff, ML)	
		8	12		16		
35	10	6	8			(stiff)	
		7	14		15		
40	11	10	12			(v.stiff)	
		9	5		21		

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/14/2014
 FINISH 1/14/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-8
 SURF. ELEV 602.8' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	1	1			TOPSOIL	Driller notes approx. 2" Topsoil
		2	3		3	Brown Silty CLAY, tr.sand (moist-wet, soft, CL)	
	2	6	7			Becomes Red-Brown and Gray (moist, stiff)	
		5	5		12		
5	3	5	4			Becomes Brown	
		7	9		11		
	4	15	16			(hard)	
		17	19		33		
	5	5	5			Contains occasional Silt partings and seams (stiff)	
10		7	9		12		
	6	6	7			Red-Brown Clayey SILT, little f-c Sand, tr.gravel (moist, stiff, ML)	
		7	7		14		
15							
	7	9	8			Brown Silty CLAY, little f-c Sand, tr.gravel (moist, v.stiff, CL)	
		8	10		16		
20							
	8	7	12			Brown-Gray Clayey SILT, little f-c Sand, tr.gravel (moist, v.stiff, ML)	
		16	14		28		
25							
	9	7	15			Contains some f-c Sand	
		14	12		29		
30							
	10	12	17			(hard)	
		28	27		45		
35							
	11	16	17				
		23	25		40		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/14/2014
 FINISH 1/14/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-8
 SURF. ELEV 602.8' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
45	12	13	17				No Recovery Sample #12
		16	15		33		
50	13	13	21			Contains occasional Shale fragments	
		38	32		59		
55						Boring Complete with Auger Refusal at 47.5'	No free standing water encountered at boring completion.
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/27/2014
 FINISH 1/27/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-9
 SURF. ELEV 602.4' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	2			TOPSOIL	Driller notes approx. 3" Topsoil
		2	2		4	Brown-Black Silty CLAY, tr.sand, tr.organics (moist-wet, FILL)	
	2	2	3			Red-Brown Silty CLAY, tr.sand, occasional Silt partings (moist, medium, CL) (v.stiff)	
		3	4		6		
		3	4	7			
			9	15		16	
10	4	5	8			(moist-wet, stiff)	
			10		18		
	5	4	5				
			8	8			13
	6	4	4				
			5	6			9
15	7	2	2			Red-Brown Clayey SILT, some f-m Sand (moist-wet, medium, ML)	
		2	3		4		
20	8	9	12			Contains tr.gravel (moist, v.stiff)	
		14	16		26		
25	9	14	16			(hard)	
		15	17		31		
30	10	14	19			Gray-Brown f-c SAND, some-and Silt, tr.gravel (moist, compact, SM)	
		20	22		39		
35	11	13	15				
		17	19		32		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/27/2014
 FINISH 1/27/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-9
 SURF. ELEV 602.4' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
42	12	14	19			Brown-Gray f-m SAND and Silt, tr.gravel (moist, compact, SM)	
		21	23		40		
45						Boring Complete with Auger Refusal at 44.0'	Free standing water recorded at 22.0' at boring completion.
46							
47							
48							
49							
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							
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75							
76							
77							
78							
79							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/27/2014
 FINISH 1/27/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-10
 SURF. ELEV 600.4' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES	
		0/6	6/12	12/18	N			
5	1	2	2			TOPSOIL	Driller notes approx. 3" Topsoil	
		3	3		5	Black Organic Clayey SILT, little f-c Sand (moist, FILL)		
	2	4	5			Red-Brown Clayey SILT, little f-c Sand, tr.gravel		
		7	6		12	(moist, stiff, ML)		
	3	12	11					
		11	12		22			
10	4	8	10				(hard)	
		13	12		23			
	5	12	5					
		15	17		20			
	6	5	14					
		17	15		31			
15						Boring Complete with Auger Refusal at 13.5'		No free standing water encountered at boring completion.
20								
25								
30								
35								
40								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/27/2014
 FINISH 1/27/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-10A
 SURF. ELEV 600.4' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5						OVERBURDEN SOILS	Boring B-10A is a continuation of Boring B-10. Driller notes moving 7' north and augering to refusal.
10						Boring Complete with Auger Refusal at 11.7'	No free standing water encountered at boring completion.
15							
20							
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/6/2013
 FINISH 12/6/2013
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-11
 SURF. ELEV 601.7' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	2			TOPSOIL Black CINDERS, little Silt (moist, FILL)	Driller notes approx. 4" Topsoil
		3	2		5		
5	2	2	3			Red-Brown Silty CLAY, tr.sand (moist, medium, CL)	
		4	4		7		
5	3	4	4			Red-Brown Clayey SILT, tr.sand (moist, stiff, ML)	
		5	5		9		
5	4	5	6			Becomes Brown	
		5	6		11		
10	5	2	3			Brown Silty CLAY, tr.sand (moist-wet, medium, CL)	
		2	3		5		
10	6	3	3				
		4	5		7		
15	7	1	2			Contains some f-c Sand	
		2	3		4		
20	8	2	2			Contains tr.sand, tr.gravel	
		3	4		5		
25	9	8	9			Brown-Orange Clayey SILT, little f-c Sand, tr.gravel (moist, v.stiff, ML)	
		12	13		21		
30	10	4	3			(wet, medium)	
		4	5		7		
35	11	2	1				
		3	1		4		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/26/2014
 FINISH 1/26/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-12
 SURF. ELEV 599.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES	
		0/6	6/12	12/18	N			
5	1	2	2			TOPSOIL Red-Brown Silty CLAY, little f-c Sand (moist, medium, CL) (stiff) Contains some f-c Sand, tr.gravel (v.stiff)	Driller notes approx. 4" Topsoil	
		3	4		5			
	2	3	5					
		4	6		9			
	3	5	7					
		10	13		17			
10	4	4	9			Becomes Brown-Gray, contains tr.gravel (hard)		
		12	15		21			
	5	6	21					
		33	30		54			
	6	10	19					
		36	37		55			
15								
20	7	13	28			Brown-Gray f-m SAND and Clayey Silt, tr.gravel (moist, v.compact, SC-SM)		
		36	38		64			
20	8	22	36					
		34	39		70			
25						Boring Complete at 20.0'	No free standing water encountered at boring completion.	
30								
35								
40								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/5/2013
 FINISH 12/5/2013
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-14
 SURF. ELEV 602.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	3			TOPSOIL	Driller notes approx. 10" Topsoil
		4	9		7	Red-Brown and Black Clayey SILT, little f-c Sand, tr.gravel (moist, FILL)	
	2	12	6			Red-Brown Silty CLAY, tr.-little f-c Sand (moist, stiff, CL)	
		8	10		14		
	3	8	7			Contains some f-c Sand, tr.gravel (v.stiff)	
10		10	11		17		
	4	9	10				
		9	11		19		
	5	9	12				
		11	15		23		
15	6	10	14				
		15	18		29		
	7	4	5			(moist-wet, stiff, CL)	
		6	8		11		
20							
	8	6	7			(v.stiff)	
		11	15		18		
	9	12	14			Brown-Gray f-c SAND and Clayey Silt, little f-c Gravel (moist, firm, SC-SM)	
25		8	13		22		
	10	15	10				Poor Recovery Sample #10
		9	12		19		
30							
	11	12	13			Red-Brown Silty CLAY, tr.sand (moist-wet, v.stiff, CL)	
		15	16		28		
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/5/2013
 FINISH 12/5/2013
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-14
 SURF. ELEV 602.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
45	12	6	10				
		13	14		23		
50	13	13	18			Brown-Gray SILT and Fine Sand, tr.gravel (moist, compact, ML)	
		20	23		38		
	14	50/0.1			REF		
55						Boring Complete with Sample Spoon Refusal at 47.5' and Auger Refusal at 47.7'	Free standing water recorded at 38.2' at boring completion.
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. KOSKE DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/17/2014
 FINISH 1/17/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-15
 SURF. ELEV 602.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	3			TOPSOIL Red-Brown Clayey SILT, little f-c Sand (moist, medium, ML) (v.stiff)	Driller notes approx. 3.5" Topsoil
		5	6		8		
5	2	6	11			Becomes Brown	
		12	14		23		
5	3	11	12			Contains tr.gravel (hard)	
		12	16		24		
10	4	14	18			(v.stiff)	
		23	24		41		
10	5	9	12				
		14	16		26		
10	6	12	14			Contains some f-c Sand (hard)	
		11	16		25		
15	7	5	9			Boring Complete at 20.0'	No free standing water encountered at boring completion.
		15	16		24		
20	8	17	21				
		26	30		47		
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/17/2014
 FINISH 1/17/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-16
 SURF. ELEV 599.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	WOH	3			TOPSOIL	Driller notes approx. 6" Topsoil
		4	4		7	Red-Brown Clayey SILT, little-some f-c Sand, tr.gravel (moist, FILL)	
5	2	12	11			Red-Brown Clayey SILT, tr.-little f-c Sand (moist, v.stiff, ML)	WOH = Weight of Hammer and Rods
		12	16		23		
5	3	10	11			Contains little f-c Gravel (hard)	
		18	17		29		
10	4	16	25				
		27	33		52		
10	5	11	18				
		22	24		40		
15	6	10	14				
		19	23		33		
15	7	5	10			(moist-wet, v.stiff)	
		10	12		20		
20	8	15	21			Red-Brown Silty CLAY, tr.-little f-c Sand (moist, hard, CL)	
		22	18		43		
						Boring Complete at 20.0'	No free standing water encountered at boring completion.
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/23/2014
 FINISH 1/23/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-17
 SURF. ELEV 598.2' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	3	2			TOPSOIL	
		1	2		3	Brown-Black Silty CLAY, tr.sand, tr.organics (wet, FILL)	
	2	4	3			Gray-Brown f-c SAND and Silt (wet, FILL)	
		4	3		7		
5	3	4	6			Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		5	6		11		
	4	8	7			Red-Brown Clayey SILT, little f-c Sand, tr.gravel (moist, stiff, ML)	
		8	11		15		
	5	6	11			Red-Brown Silty CLAY, tr.sand (moist, hard, CL)	
10		20	16		31		
	6	12	14				
		20	22		34		
15							
	7	10	10			(v.stiff)	
		12	15		22		
20							
	8	11	16			Brown-Gray Clayey SILT, some f-c Sand, tr.gravel (moist, hard, ML)	
		15	20		31		
25						Boring Complete at 22.0'	No free standing water reading obtained at boring completion.
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/20/2014
 FINISH 1/20/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-18
 SURF. ELEV 588.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			TOPSOIL	Driller notes approx. 3" Topsoil
		3	3		6	Brown-Black Silty CLAY, tr.sand, tr.organics (moist, FILL)	
	2	5	6				
		5	7		11		
10	3	3	5			Red-Brown Silty CLAY, tr.-little f-c Sand (moist-wet, stiff, CL)	Poor Recovery Sample #6
		5	4		10		
	4	7	11			Brown-Gray Clayey SILT, some f-c Sand, tr.gravel (moist, v.stiff, ML)	
		14	12		25		
15	5	7	11				
		12	15		23		
	6	8	8				
		10	14		18		
20	7	14	15			(hard)	
		17	21		32		
	8	5	7				
		34	50/0.4		41		
25	9	4	8			Brown-Gray Silty CLAY, some f-c Sand, tr.gravel (moist-wet, v.stiff, CL)	
		12	14		20		
	10	1	1			Becomes Red-Brown (wet, medium)	
		3	2		4		
35							
40						Boring Complete with Auger Refusal at 35.0'	No free standing water reading obtained at boring completion.

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE : _____
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
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SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-19
 SURF. ELEV 592.3' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	2	2			TOPSOIL	
		2	4		4	Black-Brown Clayey SILT, some f-c Sand (moist, FILL)	
	2	2	2			Yellow-Brown Silty CLAY, little Fine Sand	
		2	2		4	(moist-wet, medium, CL)	
5	3	3	3			Yellow-Brown Fine SAND, little-some Silt	
		2	2		5	(moist-wet, v.loose, SM)	
	4	2	2				
		3	2		5		
	5	2	2			Red-Brown Silty CLAY, little f-c Sand, tr.gravel	
10		4	5		6	(moist-wet, medium, CL)	
	6	4	6			(stiff)	
		5	7		11		
15							
	7	7	8			Red-Brown f-m SAND, some-and Silt, little f-c Gravel	
		12	14		20	(moist, firm, SM)	
	8	10	11			Contains tr.clay	
20		13	11		24		
						Boring Complete at 20.0'	No free standing water encountered at boring completion.
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/21/2014
 FINISH 1/21/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-20
 SURF. ELEV 597.0' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	6	3			TOPSOIL	
		5	3		8	Black-Brown Clayey SILT, tr.sand, tr.organics (moist-wet, FILL)	
	2	5	5			Red-Brown Clayey SILT, tr.sand (moist, stiff, ML)	
		5	5		10		
5	3	5	8				
		7	6		15		
	4	8	10			Red-Brown Silty CLAY, tr.sand (moist, v.stiff, CL)	
		12	8		22		
	5	6	6			Becomes Brown (stiff)	
		6	6		12		
10	6	3	4				
		5	6		9		
15	7	4	7			Brown-Gray Clayey SILT, little-some f-c Sand, tr.gravel (moist, stiff, ML)	
		8	12		15		
20	8	12	13			(v.stiff)	
		15	14		28		
25	9	7	11				
		12	12		23		
30	10	3	7				
		12	13		19		
35	11	WOH/2.0			WOH	Brown-Gray Silty CLAY, tr.sand (moist-wet, v.soft, CL)	WOH = Weight of Hammer and Rods
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/21/2014
 FINISH 1/21/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-20
 SURF. ELEV 597.0' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
12	12	WOH/2.0			WOH	Gray Fine SAND, some-and Silt, tr.gravel (wet, v.loose, SM)	WOH = Weight of Hammer and Rods
45						Boring Complete with Auger Refusal at 43.5'	Free standing water recorded at 16.5' at boring completion.
50							
55							
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/21/2014
 FINISH 1/21/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-21
 SURF. ELEV 598.2' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	1			Red-Brown Silty CLAY, tr.sand (moist, medium CL)	Poor Recovery Sample #2 and #3
		3	2		4		
5	2	3	3			Red-Brown Clayey SILT, little f-c Sand (moist, v.stiff, ML)	
		3	4		6		
5	3	6	9			Contains tr.gravel (hard)	
		12	12		21		
10	4	9	6			(hard)	
		12	17		18		
10	5	25	24			REF = Sample Spoon Refusal	
		35	37		59		
15	6	34	50/0.1		REF		
15	7	9	15			Becomes Brown	
		31	38		46		
20	8	3	2			Brown Silty CLAY, tr.sand (moist-wet, medium, CL)	
		3	3		5		
25	9	1	1			Becomes Red-Brown (v.soft)	
		1	1		2		
30	10	3	4			(stiff)	
		5	8		9		
35	11	12	23			Becomes Brown-Gray (hard)	
		22	28		45		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/21/2014
 FINISH 1/21/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-21
 SURF. ELEV 598.2' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				N	SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18				
	12	31	46	50/0.4	REF		Brown-Gray f-c SAND and Silt, little f-c Gravel (moist, v.compact, SM)	
45							Boring Complete with Sample Spoon Refusal at 41.4' and Auger Refusal at 41.5'	Free standing water recorded at 39.0' at boring completion. REF = Sample Spoon Refusal
50								
55								
60								
65								
70								
75								
80								

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/12/2013
 FINISH 12/12/2013
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-22
 SURF. ELEV 599.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	WOH	1			TOPSOIL	Driller notes approx. 11" Topsoil WOH = Weight of Hammer and Rods
		1	2		2	Brown Silty CLAY, tr.sand (moist, v.soft, CL-CH)	
	2	2	2			(medium)	
		3	3		5		
	3	4	3			Becomes Red-Brown	
10		4	5		7		No Recovery Sample #6 and #7
	4	4	5			(stiff, CL)	
		5	5		10		
	5	4	7			Contains "and" f-c Sand, tr.gravel	
		8	7		15		
15	6	12	7				
		8	8		15		
	7	13	8				
		9	10		17		
20							
	8	4	5			Contains tr.-little f-c Sand	
		4	6		9		
	9	3	4			(medium)	
25		4	4		8		
	10	2	3			Becomes Brown	
		2	3		5		
30							
	11	5	6			Brown f-c SAND and Clayey Silt, little f-c Gravel (moist, firm, SC-SM)	
		7	7		13		
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/12/2013
 FINISH 12/12/2013
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-22
 SURF. ELEV 599.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	12	37	42	50/0.3	REF	Gray Highly Weathered SHALE Rock (wet)	
45						Boring Complete with Sample Spoon Refusal at 41.3' and Auger Refusal at 44.1'	No free standing water reading obtained at boring completion.
50							
55							
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/12/2013
 FINISH 12/12/2013
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-23
 SURF. ELEV 596.8' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	3			TOPSOIL Brown Silty CLAY, tr.sand (moist, medium, CL)	Driller notes approx. 11" Topsoil
		3	3		6		
5	2	3	2			Becomes Red-Brown, Contains occasional Silt seams (stiff)	
		4	5		6		
5	3	2	4			Red-Brown Clayey SILT, tr.sand, tr.gravel (moist, stiff, ML)	
		5	5		9		
10	4	5	6			(v.stiff)	
		7	6		13		
10	5	7	8			Becomes Brown-Gray	
		7	9		15		
15	6	8	7			Gray-Brown f-m SAND and Clayey Silt, tr.gravel (moist, firm, SC-SM)	
		10	10		17		
20	7	7	10			Boring Complete at 22.0'	No free standing water encountered at boring completion.
		12	14		22		
25	8	11	10				
		11	14		21		
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/22/2014
 FINISH 1/22/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-24
 SURF. ELEV 598.6' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	1	1			TOPSOIL	
		1	1		2	Black-Brown Clayey SILT, little f-c Sand, tr.gravel (moist, FILL)	
	2	2	2			Contains tr.wood fragments	
		3	2		5	Red-Brown and Gray Silty CLAY, tr.sand, occasional Silt partings (moist, medium, CL)	
5	3	5	4				
		4	5		8		
	4	9	9			(v.stiff)	
		9	8		18		
	5	10	7			Red-Brown Clayey SILT, tr.sand, occasional Fine Sand lenses (moist, v.stiff, ML)	
10		9	9		16		
	6	10	12			Contains tr.gravel	
		15	15		27		
15							
	7	4	7			Brown-Gray Silty CLAY, little-some f-c Sand, tr.gravel (moist, v.stiff, CL)	
		14	11		21		
20							
	8	6	15			(hard)	
		17	22		32		
25							
	9	10	14				
		17	20		31		
30							
	10	3	3			(medium)	
		4	5		7		
35							
	11	14	17			Brown-Gray f-m SAND, some-and Silt, tr.gravel (moist, compact, SM)	
		21	28		38		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/22/2014
 FINISH 1/22/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-24
 SURF. ELEV 598.6' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

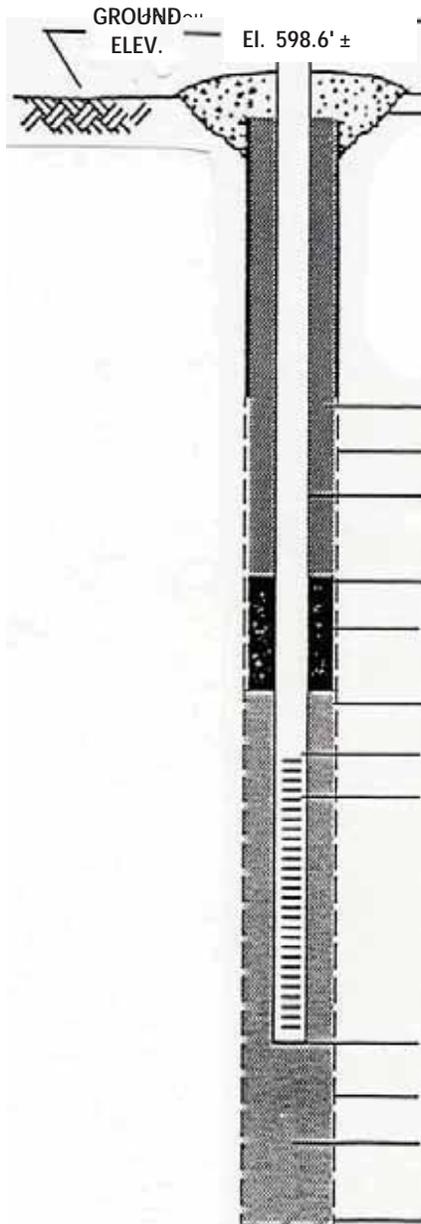
DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
12	12	47	50	50/0.2	REF	(v.compact)	
45						Boring Complete with Sample Spoon Refusal at 41.2' and Auger Refusal at 41.3'	No free standing water reading obtained at boring completion. 2" PVC Groundwater Observation Well installed at boring completion. Refer to installation log for details.
50							
55							
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD



WELL NUMBER: B-24	
PROJECT NAME: WESTWOOD CC	DRILLING METHOD: HOLLOW STEM AUGERS
PROJECT NUMBER: BE-13-192	GEOLOGIST: N/A
DRILLER: A. JAKUBCZAK	INSTALLATION DATE(S): 1/22/2014



RISER STICK-UP:	0.7' El. 599.3' ±
TYPE OF SURFACE SEAL:	NONE
TYPE OF BACKFILL:	AUGER CUTTINGS
BOREHOLE DIAMETER:	8" ±
I.D. OF RISER PIPE:	2.0"
TYPE OF RISER PIPE:	PVC
DEPTH OF SEAL:	32.0' El. 566.6' ±
TYPE OF SEAL:	BENTONITE CHIPS
DEPTH OF SAND PACK:	34.0' El. 564.6' ±
DEPTH OF TOP OF SCREEN:	36.0' El. 562.6' ±
TYPE OF SCREEN:	PVC
SLOT SIZE X LENGTH:	.010 X 5.0'
I.D. OF SCREEN:	2.0"
TYPE OF SAND PACK:	MORIE "O" FILTER SAND
DEPTH BOTTOM OF SCREEN:	41.0' El. 557.6' ±
DEPTH BOTTOM OF SAND PACK:	41.0' El. 557.6' ±
TYPE OF BACKFILL BELOW OBSERVATION WELL:	N/A
ELEVATION/ DEPTH OF HOLE:	41.0' El. 557.6' ±

DATE
 START 1/22/2014
 FINISH 1/22/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-25
 SURF. ELEV 594.8' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	1			TOPSOIL	Driller notes approx. 4" Topsoil.
		3	7		4	Red-Brown Clayey SILT, tr.-little f-c Sand (moist, FILL)	
5	2	4	5			Red-Brown Clayey SILT, little-some f-c Sand, tr.gravel (moist, stiff, ML)	(v.stiff)
		9	9		14		
5	3	5	9				Contains little f-c Sand
		11	12		20		
10	4	9	7				
		10	11		17		
10	5	10	12				
		11	11		23		
15	6	6	10				
		12	14		22		
20	7	12	14				
		16	17		30		
25	8	7	11				
		13	17		24		
30	9	10	13			Contains occasional boulder fragments	
		12	15		25		
35	10	2	6			Brown-Gray Silty CLAY, tr.sand (moist-wet, stiff, CL)	
		6	6		12		
40	11	WOH/2.0			WOH	Becomes Red-Brown (v.soft)	WOH = Weight of Hammer and Rods

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/22/2014
 FINISH 1/22/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-25
 SURF. ELEV 594.8' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	12	50/0.2			REF	Gray-Black Weathered SHALE Rock (moist-wet)	
45						Boring Complete with Sample Spoon Refusal and Auger Refusal at 40.2'	Free standing water recorded at 13.6' at boring completion.
50							REF = Sample Spoon Refusal
55							
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/23/2014
 FINISH 1/23/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-26
 SURF. ELEV 594.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	1	1			TOPSOIL	
		2	3		3	Brown-Black Organic Clayey SILT, little Fine Sand (wet, FILL)	
	2	4	5			Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)	
5		7	6		12		
	3	4	7			Contains occasional Silt partings	
		8	7		15		
	4	11	11			(v.stiff)	
		10	5		21		
	5	7	5			(stiff)	
10		10	9		15		
	6	2	4			Brown Clayey SILT, little f-c Sand, tr.gravel (moist, stiff, ML)	
		7	8		11		
15							
	7	5	8			Brown Silty CLAY, little f-c Sand (moist, v.stiff, CL)	
		13	14		21		
20							
	8	6	10			Brown Clayey SILT, little-some f-c Sand, tr.gravel (moist, v.stiff, ML)	
		11	11		21		
25							
	9	8	11			Becomes Brown-Gray	
		12	14		23		
30							
	10	WOH	3			Red-Brown and Gray Silty CLAY, tr.sand (moist, stiff, CL)	WOH = Weight of Hammer and Rods
		6	6		9		
35							
	11	8	11			Brown-Gray f-m SAND and Silt, tr.-little f-c Gravel (moist, firm, SM)	
		13	10		24		
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/23/2014
 FINISH 1/23/2014
 SHEET 2 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-26
 SURF. ELEV 594.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	12	6	50/0.3		REF	Contains little SILT, tr.shale	
45						Boring Complete with Sample Spoon Refusal and Auger Refusal at 40.8'	Free standing water recorded at 33.5' at boring completion. REF = Sample Spoon Refusal
50							
55							
60							
65							
70							
75							
80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/23/2014
 FINISH 1/23/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-27
 SURF. ELEV 594.3' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	1			Brown-Black Silty CLAY, tr.sand (moist, FILL)	
			1	2			
5	2	2	3			Brown Silty CLAY, tr.sand (moist, medium, CL)	
			2	2			
5	3	3	3			Becomes Red-Brown	
			4	7			
5	4	4	5			(stiff)	
			7	7			
10	5	6	7			(v.stiff)	
			11	11			
10	6	9	9				
			11	14			
15							
15	7	12	16			Becomes Brown-Gray, contains little f-c Sand (hard)	
			20	26			
20							
20	8	14	22			Brown-Gray Clayey SILT, some-and f-c Sand (moist, hard, ML)	
			26	27			
25						Boring Complete at 22.0'	No free standing water reading obtained at boring completion.
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/23/2014
 FINISH 2/5/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-29
 SURF. ELEV 594.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES	
		0/6	6/12	12/18	N			
5	1	2	2			TOPSOIL	Driller notes approx. 3" Topsoil	
		2	2		4	Brown-Black Clayey SILT, tr.sand, tr.organics (moist, FILL)		
	2	3	4			Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)		
		5	9		9			
	3	3	5					
10		9	9		14			
	4	8	11			Red-Brown Clayey SILT, little-some f-c Sand, tr.gravel (moist, v.stiff, ML)		
		13	15		24	(hard)		
	5	15	16		34	(v.stiff)		
		18	18		34			
15	6	7	12					
		14	16		26			
	7	15	14					
20		16	17		30			
	8	8	30			Gay-Brown f-m SAND, some-and Silt, little f-c Gravel (moist, v.compact, SM)		
		38	36		68			
25	9	10	17			Gray Fine SAND, some Silt (moist-wet, compact, SM)		
		28	25		45			
30	10	15	25			Gray-Brown f-m SAND, some-and Silt, little f-c Gravel (moist, compact, SM)	Free standing water recorded at 19.3' prior to coring. NQ '2' Size Rock Core	
		24	27		49			
35						Gray Shale Rock, medium hard, sound, thinly bedded to bedded, occasional gypsum partings.	RUN #1: 33.5' - 38.5' REC = 82% RQD = 42%	
40						Boring Complete at 38.5'		

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/17/2014
 FINISH 1/17/2014
 SHEET 1 OF 2

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-31
 SURF. ELEV 592.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			TOPSOIL	Driller notes approx. 6" Topsoil
		3	5		6	Orange-Brown mottled Silty CLAY, tr.sand (moist, medium, CL)	
	2	4	5			Orange-Brown and Gray Silty CLAY, some Fine Sand (moist, stiff, CL)	
		6	7		11		
	3	4	10			Becomes Red-Brown, contains tr.sand (v.stiff)	
		11	22		21		
10	4	6	10			Contains little f-c Sand, tr.gravel, tr.boulder fragments (hard)	
		13	19		23		
	5	16	50/0.3		REF		REF = Sample Spoon Refusal
	6	10	15				Contains some f-c Sand
		23	26		38		
15	7	9	20			No Recovery Sample #7	
		21	23		41		
	8	6	9				Becomes Brown-Gray (v.stiff)
	15	17		24			
25	9	5	4			Contains some f-c Sand (stiff)	
		7	11		11		
30	10	1	3			Brown Silty CLAY, tr.sand, numerous Silt partings and seams (moist-wet, stiff, CL)	
		8	10		11		
35	11	23	31	50/0.4	REF	Brown f-c SAND and Silt, tr.gravel, tr.shale (moist, v.compact, SM)	
40						RUN #1: 38.5' - 43.5'	

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE START <u>1/17/2014</u> FINISH <u>1/17/2014</u> SHEET <u>2</u> OF <u>2</u>	SJB SERVICES, INC. SUBSURFACE LOG	HOLE NO. <u>B-31</u> SURF. ELEV <u>592.5' ±</u> G.W. DEPTH <u>See Notes</u>
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PROJECT: <u>PROPOSED IMPROVEMENTS</u>	LOCATION: <u>WESTWOOD COUNTRY CLUB</u>
PROJ. NO.: <u>BE-13-192</u>	<u>AMHERST, NEW YORK</u>

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
45						Gray SHALE Rock, medium hard, slightly weathered to sound, laminated to bedded, occasional gypsum partings and seams	REC = 75% RQD = Approx. 25%
50						Boring Complete at 43.5'	No free standing water reading obtained at boring completion.
51							
52							
53							
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80							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW	CLASSIFIED BY: <u>Geologist</u>
DRILLER: <u>A. JAKUBCZAK</u>	DRILL RIG TYPE: <u>CME-550X</u>
METHOD OF INVESTIGATION <u>ASTM D-1586 USING HOLLOW STEM AUGERS</u>	

DATE
 START 1/31/2014
 FINISH 1/31/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-32
 SURF. ELEV 594.0' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			TOPSOIL	Driller notes approx. 3" Topsoil
		2	2		5	Brown-Black Silty CLAY, tr.sand, tr.organics (moist, FILL)	
	2	4	3				
10		3	5		6		Red-Brown Clayey SILT, tr.sand (moist v.stiff, ML)
	3	5	8				
		10	13		18		
15		4	6	7			(moist-wet)
		9	10		16		
	5	8	10				
20		11	12		21		Contains tr.gravel
	6	7	10				
		13	15		23		
25							Becomes Brown
	7	6	12				
		12	16		24		
30							Brown Silty CLAY, tr.sand (moist-wet, v.stiff, CL)
	8	5	7				
		11	10		18		
35							Brown-Gray f-m SAND and Silt, tr.gravel (moist, v.compact, SM)
	9	17	28				
		27	29		55		
40							Gray-Brown SHALE Rock fragments (moist)
	10	50/0.4			REF		
							Boring Complete with Sample Spoon Refusal at 30.4' and Auger Refusal at 30.5'
							No free standing water encountered at boring completion.

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/24/2014
 FINISH 1/24/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-33
 SURF. ELEV 592.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	3	1			TOPSOIL	
		1	1		2	Red-Brown and Black Clayey SILT, little f-c Sand (moist, FILL)	
	2	6	5			Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		5	5		10		
5	3	2	4			Red-Brown f-c SAND, some-and Silt, tr.gravel (moist-wet, firm, SM)	
		7	7		11	Red-Brown Clayey SILT, some-and f-c Sand, little f-c Gravel (moist, v.stiff, ML)	
	4	10	10				
		12	13		22	Contains little f-c Sand	
	5	11	13				
10		12	14		25		
	6	8	11				
		12	15		23	Becomes Brown (hard)	
	7	8	14				
		13	13		27	Boring Complete at 20.0'	No free standing water encountered at boring completion.
	8	22	34				
20		38	27		72		
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/12/2013
 FINISH 12/12/2013
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-34
 SURF. ELEV 593.4' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	1	3			TOPSOIL	Driller notes approx. 12" Topsoil
		4	4		7	Red-Brown and Black Silty CLAY, tr.sand (moist, FILL)	
	2	11	4			Brown Clayey SILT, tr.sand (moist, stiff, ML)	
		5	6		9		
5	3	6	8			Red-Brown Silty CLAY, tr.sand, occasional Silt partings (moist, stiff, CL)	
		7	7		15		
	4	10	7			Red-Brown Clayey SILT, tr.-little f-c Sand, tr.gravel (moist, stiff, ML)	
		8	12		15		
10	5	10	12			(v.stiff)	
		13	13		25		
	6	15	10				
		12	15		22		
15	7	11	12			Gray-Brown f-c SAND and Clayey Silt, little f-c Gravel (moist, firm, SC-SM)	
		15	17		27		
20	8	7	7				
		15	18		22		
25	9	41	50/0.3		REF	Brown-Gray f-m SAND and Silt, tr.gravel (moist, v.compact, SM)	REF = Sample Spoon Refusal
30	10	50/0.4			REF		
35						Boring Complete with Sample Spoon Refusal and Auger Refusal at 31.4'	No free standing water encountered at boring completion.
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/13/2013
 FINISH 12/13/2013
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-35
 SURF. ELEV 593.0' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	3			TOPSOIL Orange-Brown and Gray Mottled Clayey SILT, tr.sand (moist, medium, ML) Becomes Brown	Driller notes approx. 7" Topsoil
		3	2		6		
5	2	3	3			Red-Brown Silty CLAY, tr.sand (moist, v.stiff, CL)	
		4	5		7		
5	3	7	8			Red-Brown Clayey SILT, little f-c Sand (moist, v.stiff, ML)	
		11	11		19		
10	4	10	10			Contains some f-c Sand, little Gravel	
		9	11		19		
10	5	6	10			Red-Brown f-m SAND and Silt, tr.gravel (moist, v.compact, SM)	No Recovery Sample #8 REF = Sample Spoon Refusal
		11	13		21		
15	6	7	12			Becomes Brown-Gray, contains tr.boulder fragments (v.compact)	
		14	16		26		
15	7	11	13			Boring Complete with Sample Spoon Refusal at 30.2' and Auger Refusal at 32.5'	No free standing water reading obtained at boring completion.
		15	15		28		
20	8	50/0.4			REF		
25	9	39	50/0.1		REF		
30	10	50/0.2			REF		
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/30/2014
 FINISH 1/30/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-36
 SURF. ELEV 593.3' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	3			TOPSOIL	Driller notes approx. 3" Topsoil
		3	3		6	Brown Silty CLAY, tr.sand, tr.organics (moist, FILL)	
5	2	6	6			Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		7	8		13		
5	3	5	6				
		5	7		11		
10	4	7	7			Red-Brown Clayey SILT, tr.-little f-c Sand (moist, stiff, ML)	
		8	7		15		
10	5	6	5			(hard)	
		8	12		13		
15	6	12	15				
		17	19		32		
15	7	15	17			Becomes Brown	
		21	18		38		
20	8	5	5			Brown-Gray f-m SAND, some-and Silt, tr.gravel (moist, firm, SM)	
		7	31		12		
25	9	18	21			(compact)	REF = Sample Spoon Refusal
		27	41		48		
30	10	50/0.4			REF	Brown-Gray SHALE Rock frgements (wet)	
35						Boring Complete with Sample Spoon Refusal at 30.4' and Auger Refusal at 31.0'	Free standing water recorded at 28.0' at boring completion.
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/16/2014
 FINISH 1/17/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-37
 SURF. ELEV 592.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	2			TOPSOIL Brown-Black Silty CLAY, tr.sand (moist, FILL)	Driller notes approx. 8" Topsoil
		3	4		5		
5	2	4	4			Red-Brown Silty CLAY, tr.sand, occasional Silt partings (moist, stiff, CL)	
		5	6		9		
5	3	3	6			Red-Brown Clayey SILT, tr.sand (moist, v.stiff, ML)	
		8	12		14		
10	4	10	12			Contains some f-c Sand (hard) (v.stiff)	
		15	17		27		
10	5	9	14				
		17	18		31		
15	6	10	13				
		15	14		28		
20	7	29	50/0.4		REF	Gray-Brown f-m SAND and Silt, tr.gravel, tr.boulder fragments (moist, v.compact, SM)	REF = Sample Spoon Refusal
20	8	50/0.4			REF		No Recovery Sample #9
25	9	50/0.0			REF	Boring Complete with Sample Spoon and Auger Refusal at 22.5'	Free standing water recorded at 20.0' at boring completion.
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/23/2014
 FINISH 1/23/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-38
 SURF. ELEV 592.4' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			Black-Brown Clayey SILT, little f-c Sand, tr.gravel (moist, FILL)	
		3	3		6		
5	2	2	4			Brown Silty CLAY, tr.sand (moist, stiff, CL) (moist-wet) (v.stiff)	
		5	5		9		
	3	3	5				
		8	12		13		
10	4	13	14				
		13	15		27		
	5	17	14				
		7	10		21		
10	6	2	4				
		6	7		10		
15	7	5	17			Brown-Gray Clayey SILT, some f-c Sand, tr.gravel (moist, hard, ML)	
		26	24		43		
20	8	8	17			Brown-Gray f-c SAND, some-and Silt, tr.gravel (moist, compact, SM)	
		21	19		38		
25						Boring Complete with Auger Refusal at 24.0'	No free standing water encountered at boring completion.
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/16/2014
 FINISH 1/16/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-39
 SURF. ELEV 592.0' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			TOPSOIL	Driller notes approx. 4" Topsoil
		2	3		5	Brown-Black Silty CLAY, tr.sand, tr.organics (moist, FILL)	
5	2	7	9			Brown Silty CLAY, tr.sand (moist, v.stiff, CL)	REF = Sample Spoon Refusal
		10	10		19	Becomes Red-Brown	
10	3	6	7			(stiff)	REF = Sample Spoon Refusal
		10	8		17	Contains occasional Silt seams (v.stiff)	
10	4	4	7			Red-Brown f-c SAND and Silt, tr.gravel (moist-wet, loose, SM)	REF = Sample Spoon Refusal
		8	9		15		
15	5	10	9			Brown-Gray f-m SAND and Silt, tr.gravel, tr.boulder fragments (moist, v.compact, SM)	REF = Sample Spoon Refusal
		8	9		17		
15	6	4	5				REF = Sample Spoon Refusal
		5	9		10		
20	7	21	38			Boring Complete at 18.1'	No free standing water encountered at boring completion.
		41	49		79		
20	8	50/0.1			REF		No free standing water encountered at boring completion.
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/29/2014
 FINISH 1/29/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-40
 SURF. ELEV 588.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	3			TOPSOIL	No Recovery Sample #3
		2	2		5	Black Organic Silty CLAY, tr.sand (moist, FILL)	
	2	3	3			Becomes Red-Brown	
		6	7		9		
	3	4	7				
		10	11		17		
	4	8	8			Red-Brown Silty CLAY, tr.-little f-c Sand (moist, stiff, CL)	
		7	10		15		
10	5	17	15			(hard)	
		16	18		31		
	6	15	18			Red-Brown f-m SAND and Silt, tr.gravel (moist, compact, SM)	
		21	19		39		
15							
	7	18	21			Becomes Brown-Gray	
		27	33		48		
20							
	8	22	23			(v.compact)	
		35	50/0.4		58		
25						Boring Complete with Sample Spoon Refusal at 21.9' and Auger Refusal at 22.0'	Free standing water recorded at 19.0' at boring completion.
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 12/17/2013
 FINISH 12/17/2013
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-42
 SURF. ELEV 601.1' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	1			TOPSOIL	Driller notes approx. 13" Topsoil
		3	3		4	Black Clayey SILT, little Fine Sand (moist, FILL)	
5	2	5	6			Brown Silty CLAY, tr.sand (moist, stiff, CL) (v.stiff)	No Recovery Sample #4
		7	9		13		
	3	9	8				
		8	10		16		
10	4	12	8			(moist-wet)	
		9	9		17		
	5	8	11				
		12	13		23		
15	6	10	10			Becomes Red-Brown, contains little f-c Sand	
		12	12		22		
20	7	9	9				
		10	10		19		
25	8	8	9			Boring Complete at 22.0'	No free standing water encountered at boring completion.
		8	12		17		
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: T. FARRELL DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/30/2014
 FINISH 1/31/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-43
 SURF. ELEV 593.2' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	4			TOPSOIL	Driller notes approx. 6" Topsoil
		5	6		9	Black Organic Clayey SILT, little f-c Sand (moist, FILL)	
	2	4	6			Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		7	7		13	Becomes Red-Brown (v.stiff)	
10	3	5	8			(stiff)	Red-Brown Clayey SILT, little-some f-c Sand, tr.-little f-c Gravel (moist, stiff, ML)
		10	12		18		
	4	6	6				
		9	14		15		
15	5	2	6				Becomes Brown-Gray (hard)
		7	11		13		
	6	5	5				
		8	9		13		
20	7	6	27				Contains little f-c Sand (v.stiff)
		48	50		75		
	8	8	13				
		12	15		25		
25	9	10	12				Free standing water recorded at 20.0' prior to coring. NQ '2' Size Rock Core
		16	17		28		
35						Gray SHALE Rock, medium hard, sound, thinly bedded to bedded, grades predominantly gypsum at approximately 34.0'	RUN #1: 30.0' - 35.0' REC = 60% RQD = 40%
40						Boring Complete at 35.0'	Free standing water recorded at 10.0' after coring.

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/16/2014
 FINISH 1/16/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-44
 SURF. ELEV 592.7' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			TOPSOIL	Driller notes approx. 6" Topsoil
		4	7		7	Red-Brown and Black Silty CLAY, tr.sand (moist, FILL)	
5	2	7	8			Red-Brown Clayey SILT, tr.sand, occasional Fine Sand lenses (moist, stiff, ML)	
		4	10		12		
5	3	5	8			Red-Brown Silty CLAY, tr.sand (moist, v.stiff, CL-CH)	
		10	12		18		
10	4	11	14			Contains occasional Silt seams (hard) (v.stiff)	Poor Recovery Sample #6
		17	8		31		
10	5	11	10				
		8	10		18		
15	6	20	14				
		15	17		29		
20	7	18	40			Brown-Gray f-m SAND, some Silt, tr.gravel, tr.boulder fragments (moist, v.compact, SM)	REF = Sample Spoon Refusal
		39	42		79		
20	8	44	50/0.2		REF	Boring Complete with Sample Spoon Refusal at 18.7'	No free standing water encountered at boring completion.
25							
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: S. WOLKIEWICZ DRILL RIG TYPE: CME-550SE
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 2/4/2014
 FINISH 2/4/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-45
 SURF. ELEV 591.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	3	3			TOPSOIL Brown-Black Silty CLAY, tr.sand, tr.organics (moist, FILL) Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)	Driller notes approx. 7" Topsoil
			5	5			
5	2	4	5			(v.stiff)	
			6	9			
5	3	3	6			(wet, medium)	
			9	10			
10	4	5	8				
			12	15			
10	5	3	4				
			4	3			
15	6	3	3				
			4	5			
20	7	4	4			Gray f-m SAND, some-and Silt, tr.gravel (moist, SM)	REF = Sample Spoon Refusal
			4	5			
25	8	50/0.4			REF	Gray SHALE Rock, medium hard, sound, thinly bedded to bedded, occasionally gypsum seams.	NQ '2' Size Rock Core
25	9	50/0.0			REF	Boring Complete at 29.5'	RUN #1: 24.5' - 29.5' REC = Approx. 50% RQD = Approx. 20%
30							Free standing water recorded at 15.0' prior to coring. Free standing water recorded at 10.0' after coring.
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 1/31/2014
 FINISH 2/3/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-47
 SURF. ELEV 594.9' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
	1	4	5			TOPSOIL	Driller notes approx. 6" Topsoil
		6	6		11	Red-Brown Silty CLAY, tr.sand, tr.organics (moist, FILL)	
	2	3	7			Red-Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		8	10		15		
5	3	5	5			Red-Brown Clayey SILT, little f-c Sand, tr.gravel (moist, stiff, ML)	
		9	12		14		
	4	4	8			(v.stiff)	
		10	14		18		
	5	6	10			Red-Brown Silty CLAY, tr.-little f-c Sand, tr.gravel (moist, v.stiff, CL)	
10		20	23		30		
	6	8	15			Red-Brown Clayey SILT, tr.-little f-c Sand (moist, hard, ML)	
		25	29		40		
15							
	7	15	19				
		31	25		50		
20							
	8	12	21				
		26	29		47		
25							
	9	17	22			Contains some f-c Sand	
		24	24		46		
30							REF = Sample Spoon Refusal
	10	12	42	50/0.3	REF	Gray f-c SAND, some Silt, tr.gravel, tr.shale (moist, v.compact, SM)	Free standing water recorded at 20.0' prior to coring.
35						Gray SHALE Rock, medium hard, sound, thinly bedded to bedded, grade to predominantly gypsum at approximately 36.5'	RUN #1: 34.0' - 39.0' REC = 100% RQD = 64%
40						Boring Complete at 39.0'	

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

DATE
 START 2/3/2014
 FINISH 2/3/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-48
 SURF. ELEV 595.8' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

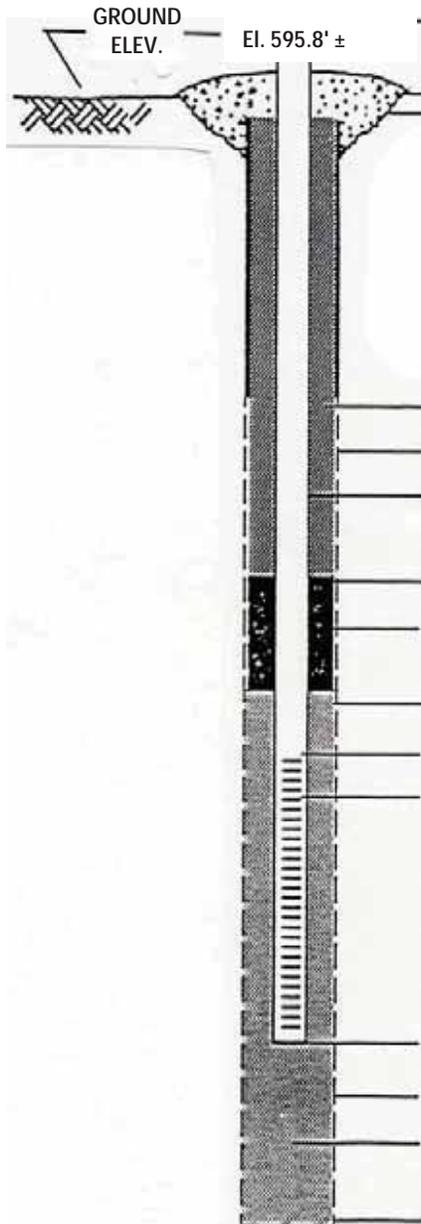
DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	1	2			TOPSOIL	Driller notes approx. 3" Topsoil
		5	5		7	Brown Silty CLAY, tr.sand, tr.organics (moist, FILL)	
5	2	3	4			Brown Silty CLAY, tr.sand (moist, stiff, CL)	
		5	6		9		
5	3	4	13			Becomes Red-Brown, contains occasional Silt partings (v.stiff)	
		16	17		29		
10	4	6	10			Red-Brown Silty CLAY, little f-c Sand, tr.gravel (moist, v.stiff, CL)	
		18	18		28		
10	5	3	13			(hard)	
		24	26		37		
15	6	5	15				
		27	30		42		
20	7	7	18			Becomes Brown-Gray	
		26	28		44		
25	8	6	11				
		28	30		39		
30	9	4	10			Contains little-some f-c Sand (v.stiff)	REF = Sample Spoon Refusal
		19	25		29		
30	10	16	50/0.4		REF	Brown-Gray f-c SAND and Silt, tr.gravel, tr.shale (moist, SM)	
35						Boring Complete with Sample Spoon Refusal at 30.9' and Auger Refusal at 31.0'	No free standing water encountered at boring completion. 2" PVC groundwater observation well installed at boring completion. Refer to installation log for details.
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

MONITORING WELL COMPLETION RECORD



WELL NUMBER: B-48	
PROJECT NAME: WESTWOOD CC	DRILLING METHOD: ASTM D1586 USING HSA
PROJECT NUMBER: BE-13-192	GEOLOGIST: N/A
DRILLER: A. JAKUBCZAK	INSTALLATION DATE(S): 2/3/2014



RISER STICK-UP:	0.9' El. 596.7' ±
TYPE OF SURFACE SEAL:	NONE
TYPE OF BACKFILL:	AUGER CUTTINGS
BOREHOLE DIAMETER:	+/- 8"
I.D. OF RISER PIPE:	2.0"
TYPE OF RISER PIPE:	PVC
DEPTH OF SEAL:	22.0' El. 573.8' ±
TYPE OF SEAL:	BENTONITE CHIPS
DEPTH OF SAND PACK:	24.0' El. 571.8' ±
DEPTH OF TOP OF SCREEN:	25.0' El. 570.8' ±
TYPE OF SCREEN:	PVC
SLOT SIZE X LENGTH:	.010 X 5.0'
I.D. OF SCREEN:	2.0"
TYPE OF SAND PACK:	MORIE "O" FILTER SAND
DEPTH BOTTOM OF SCREEN:	30.0' El. 565.8' ±
DEPTH BOTTOM OF SAND PACK:	30.0' El. 565.8' ±
TYPE OF BACKFILL BELOW OBSERVATION WELL:	NATIVE SOILS
ELEVATION/ AUGERED DEPTH:	31.0' El. 564.8' ±

DATE
 START 2/4/2014
 FINISH 2/4/2014
 SHEET 1 OF 1

SJB SERVICES, INC.
SUBSURFACE LOG



HOLE NO. B-49
 SURF. ELEV 593.5' ±
 G.W. DEPTH See Notes

PROJECT: PROPOSED IMPROVEMENTS LOCATION: WESTWOOD COUNTRY CLUB
 PROJ. NO.: BE-13-192 AMHERST, NEW YORK

DEPTH FT.	SMPL NO.	BLOWS ON SAMPLER				SOIL OR ROCK CLASSIFICATION	NOTES
		0/6	6/12	12/18	N		
5	1	2	3			TOPSOIL	Driller notes approx. 5" Topsoil
		4	4		7	Black Organic Clayey SILT, tr.-little f-c Sand (moist-wet, FILL)	
	2	3	5			Brown-Black Silty CLAY, tr.sand (moist, FILL)	
		5	7		10	Red-Brown Clayey SILT, tr.sand (moist, v.stiff, ML)	
	3	5	9				
		10	13		19		
10	4	4	12			Becomes Brown-Gray Contains tr.gravel (hard)	
		14	16		26		
	5	6	9				
		16	17		25		
	6	5	14				
		18	21		32		
15							
20	7	8	12			Boring Complete at 20.0'	
		20	27		32		
25						No free standing water encountered at boring completion.	
30							
35							
40							

N = NO. BLOWS TO DRIVE 2-INCH SPOON 12-INCHES WITH A 140 LB. PIN WT. FALLING 30-INCHES PER BLOW CLASSIFIED BY: Geologist
 DRILLER: A. JAKUBCZAK DRILL RIG TYPE: CME-550X
 METHOD OF INVESTIGATION ASTM D-1586 USING HOLLOW STEM AUGERS

APPENDIX B
LABORATORY TEST DATA



Western New York Office
5167 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192
REPORT NO.: LTR-1

Attached are the results of laboratory testing conducted on various samples from the above referenced project. Mr. John Danzer, representing Empire –Geo Services, Inc, chose samples contained in this report.

The testing conducted was as follows:

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

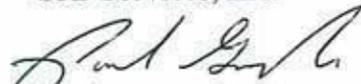
ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Samples were received at the SJB Services, Inc. laboratory on January 21, 2014 where they were processed for testing.

If the reviewer should have any questions concerning this report, please do not hesitate to contact our office at any time.

SJB Services, Inc.


Paul Gregorczyk
Laboratory Manager



Western New York Office
5167 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-1

Page 1 of 6

SAMPLE NUMBER: 14-033
SAMPLE LOCATION: B-1, S-3: 4' – 6'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
14.6 %	20	12	8

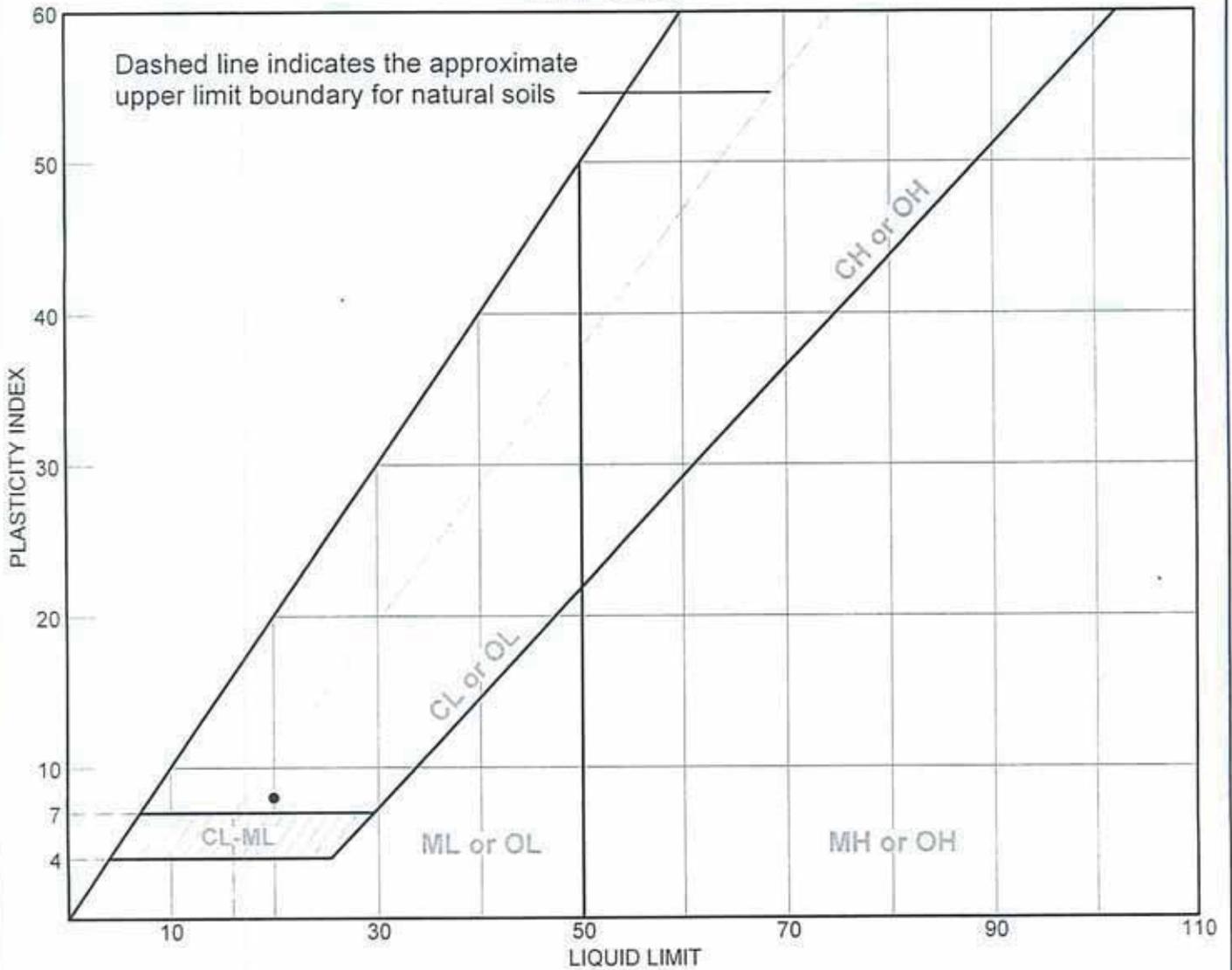
ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 27.7 %
Value of Shrinkage Limit = 12
Value of Shrinkage Ratio = 2.02

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
¾"	100.0
½"	98.4
⅜"	97.6
¼"	95.8
#4	94.8
#10	91.9
#20	88.6
#40	85.2
#100	76.8
#200	57.8

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

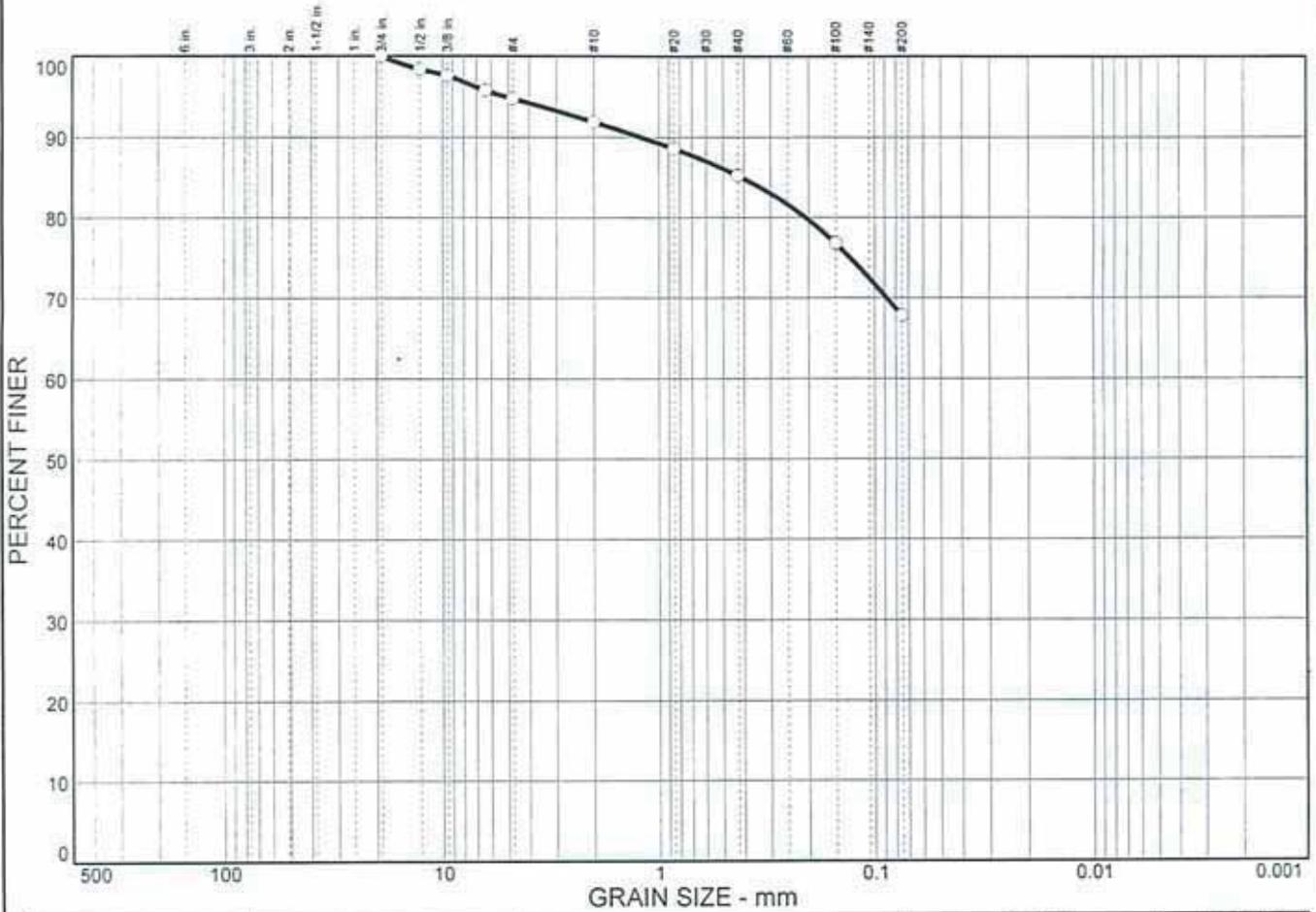


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-1	S-3	4' - 6'	14.6 %	12	20	8	

SJB
SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	5.2	27.0	67.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	98.4		
.375 in.	97.6		
.25 in.	95.8		
#4	94.8		
#10	91.9		
#20	88.6		
#40	85.2		
#100	76.8		
#200	67.8		

Soil Description

B-1, S-3: 4' - 6'

Atterberg Limits

PL= 12 LL= 20 PI= 8

Coefficients

D₈₅= 0.411 D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-033

* (no specification provided)

Sample No.: S-3
 Location: B-1, S-3: 4' - 6'

Source of Sample: B-1

Date: 1-29-14
 Elev./Depth: 4' - 6'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No: BE-13-192



Western New York Office
 5167 South Park Avenue
 Hamburg, NY 14075
 Phone: (716) 649-8110
 Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-1

Page 2 of 6

SAMPLE NUMBER: 14-034
 SAMPLE LOCATION: B-3, S-4: 6' – 8'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
14.8 %	24	13	11

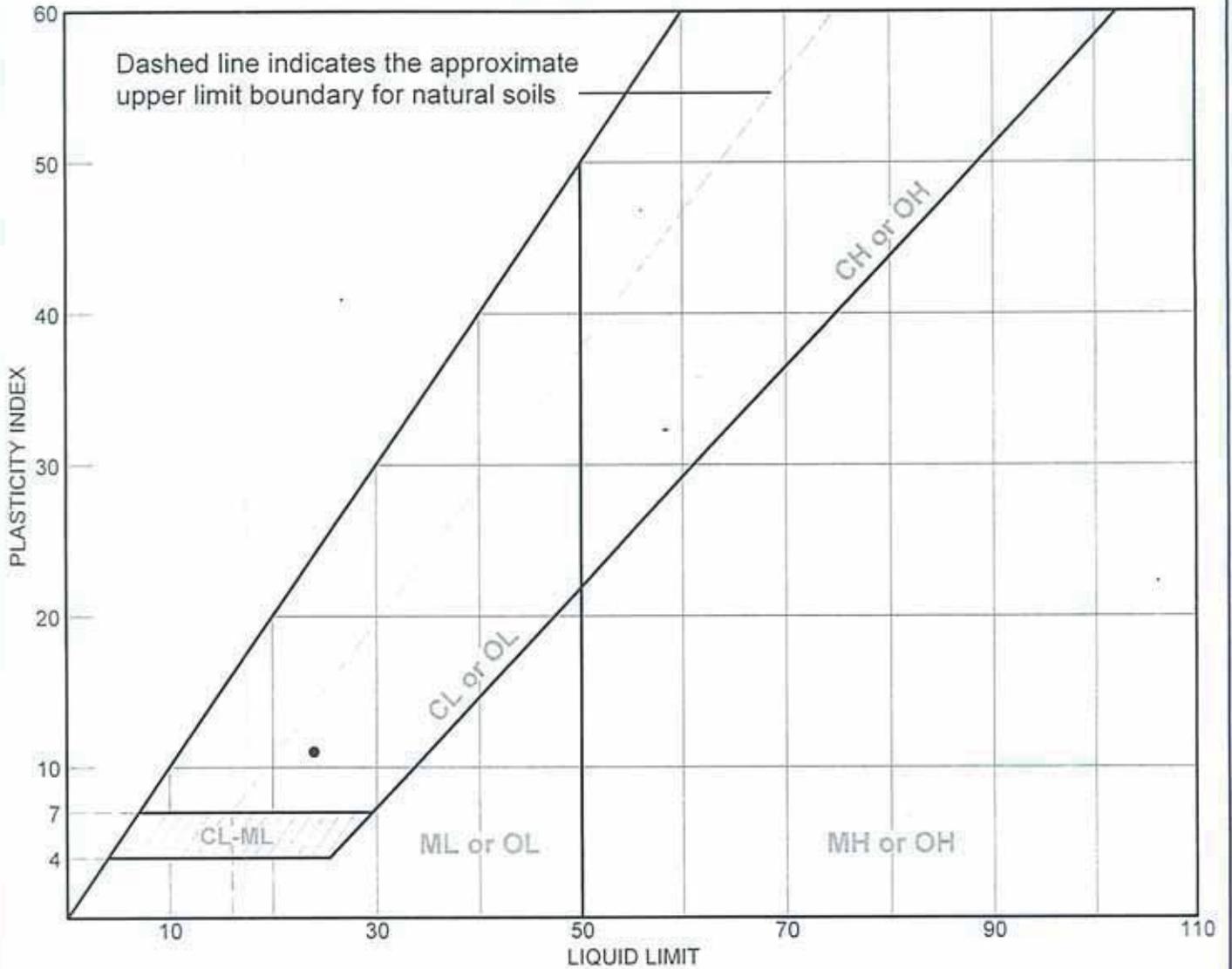
ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 32.3 %
 Value of Shrinkage Limit = 13
 Value of Shrinkage Ratio = 1.94

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
1/2"	100.0
3/8"	98.8
1/4"	98.3
#4	98.0
#10	97.2
#20	95.6
#40	94.0
#100	89.5
#200	83.2

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-3	S-4	6' - 8'	14.8 %	13	24	11	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC

Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT

Project No.: BE-13-192



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-1

Page 3 of 6

SAMPLE NUMBER: 14-039

SAMPLE LOCATION: B-7, S-6: 10' – 12'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
12.6 %	24	12	12

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 37.9 %

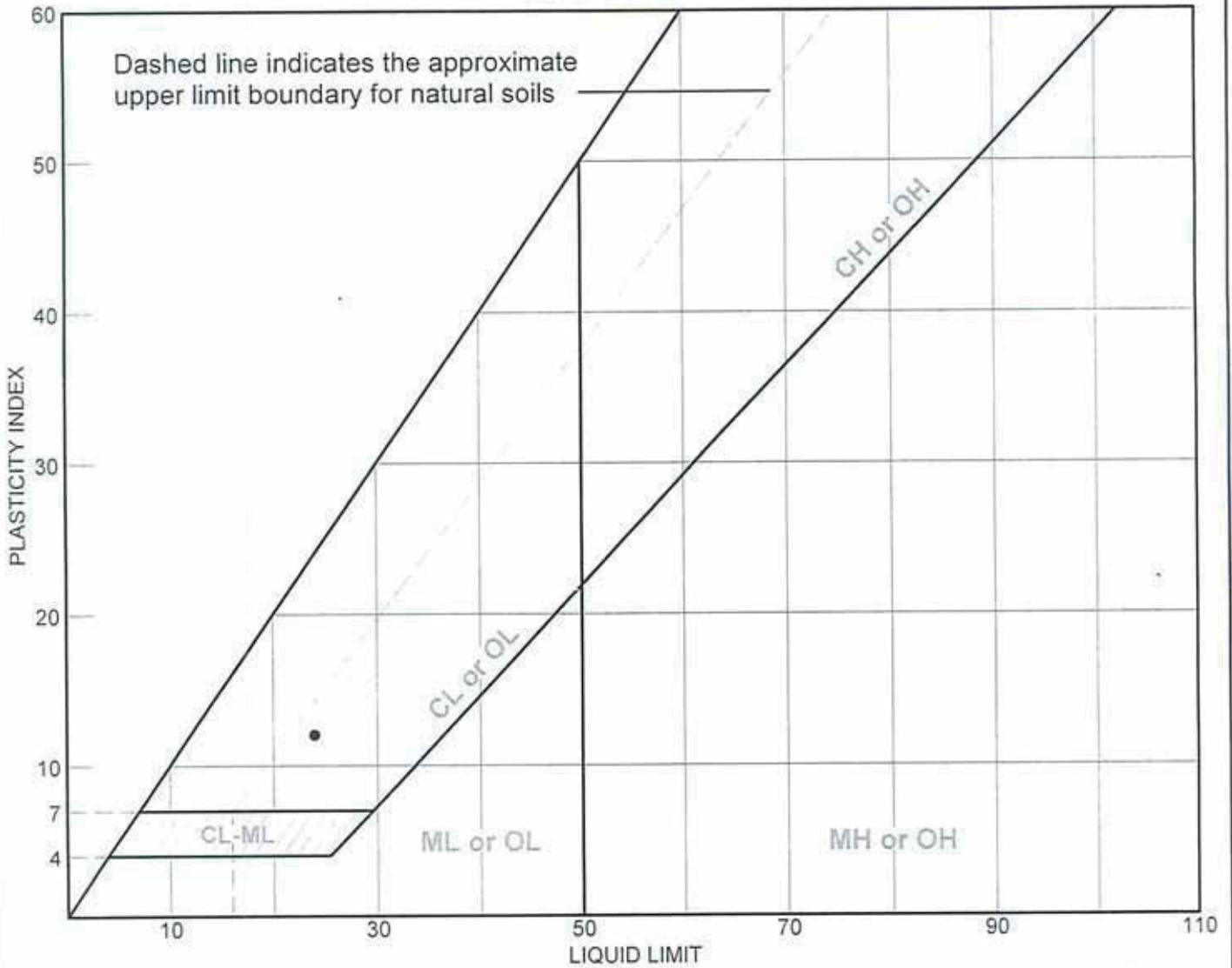
Value of Shrinkage Limit = 13

Value of Shrinkage Ratio = 1.93

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
¾"	100.0
½"	97.2
⅜"	95.9
¼"	92.5
#4	91.7
#10	89.1
#20	86.8
#40	85.0
#100	80.2
#200	74.3

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-7	S-6	10' - 12'	12.6 %	12	24	12	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	8.3	17.4	74.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.2		
.375 in.	95.9		
.25 in.	92.5		
#4	91.7		
#10	89.1		
#20	86.8		
#40	85.0		
#100	80.2		
#200	74.3		

Soil Description

B-7, S-6: 10' - 12'

Atterberg Limits

PL= 12 LL= 24 PI= 12

Coefficients

D₈₅= 0.425 D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-039

* (no specification provided)

Sample No.: S-6
 Location: B-7, S-6: 10' - 12'

Source of Sample: B-7

Date: 1-29-14
 Elev./Depth: 10' - 12'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT

Project No: BE-13-192



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-1

Page 4 of 6

SAMPLE NUMBER: 14-040

SAMPLE LOCATION: B-14, S-4: 6' – 8'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
10.7 %	23	12	11

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 32.9 %

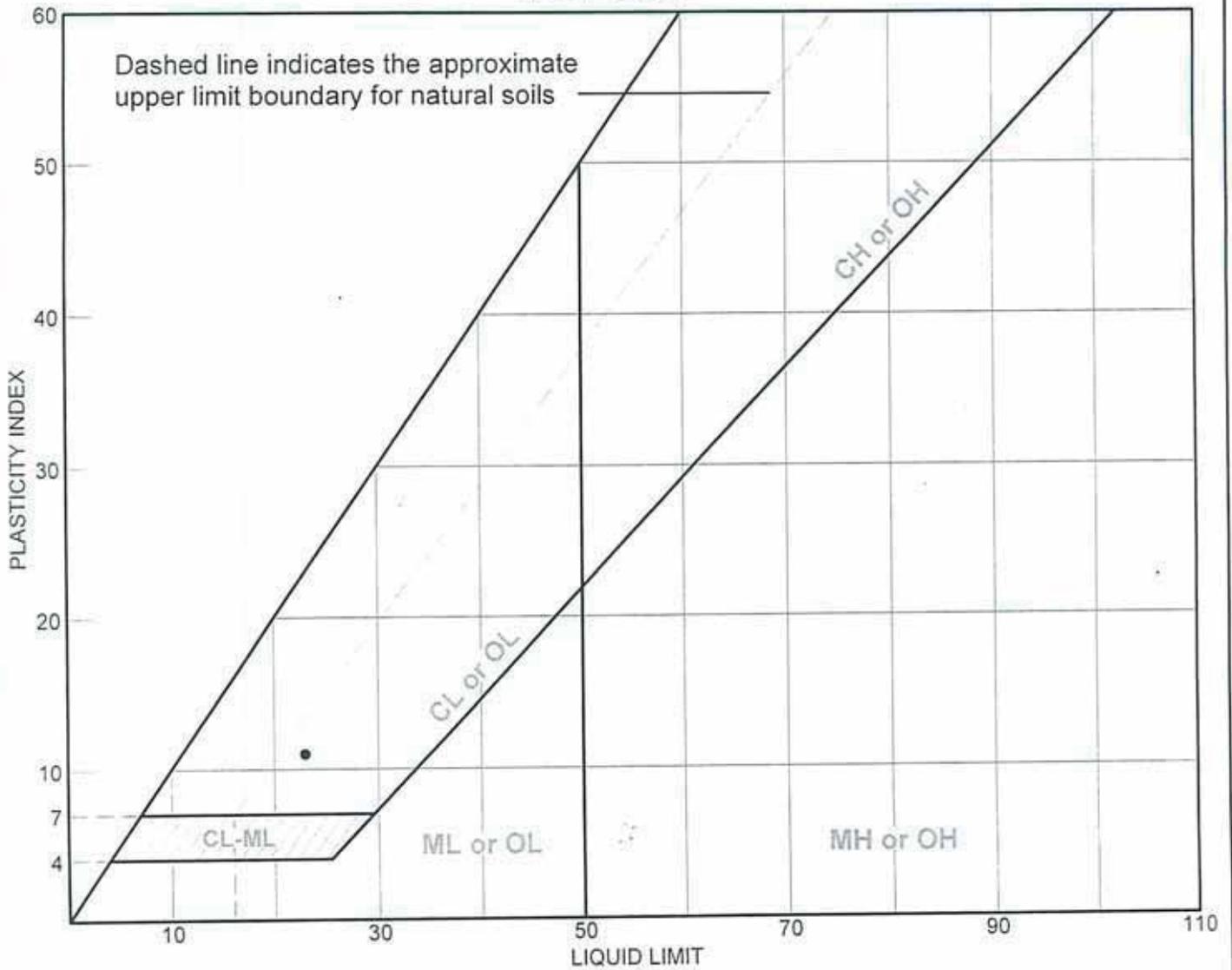
Value of Shrinkage Limit = 17

Value of Shrinkage Ratio = 1.93

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
¾"	100.0
½"	97.0
⅜"	95.3
¼"	93.2
#4	92.1
#10	89.4
#20	86.5
#40	84.1
#100	77.6
#200	70.1

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-14	S-4	6' - 8'	10.7 %	12	23	11	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT

Project No.: BE-13-192



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-1

Page 5 of 6

SAMPLE NUMBER: 14-041

SAMPLE LOCATION: B-22, S-3: 4' - 6'

*ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil*

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
26.5 %	52	22	30

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 64.8 %

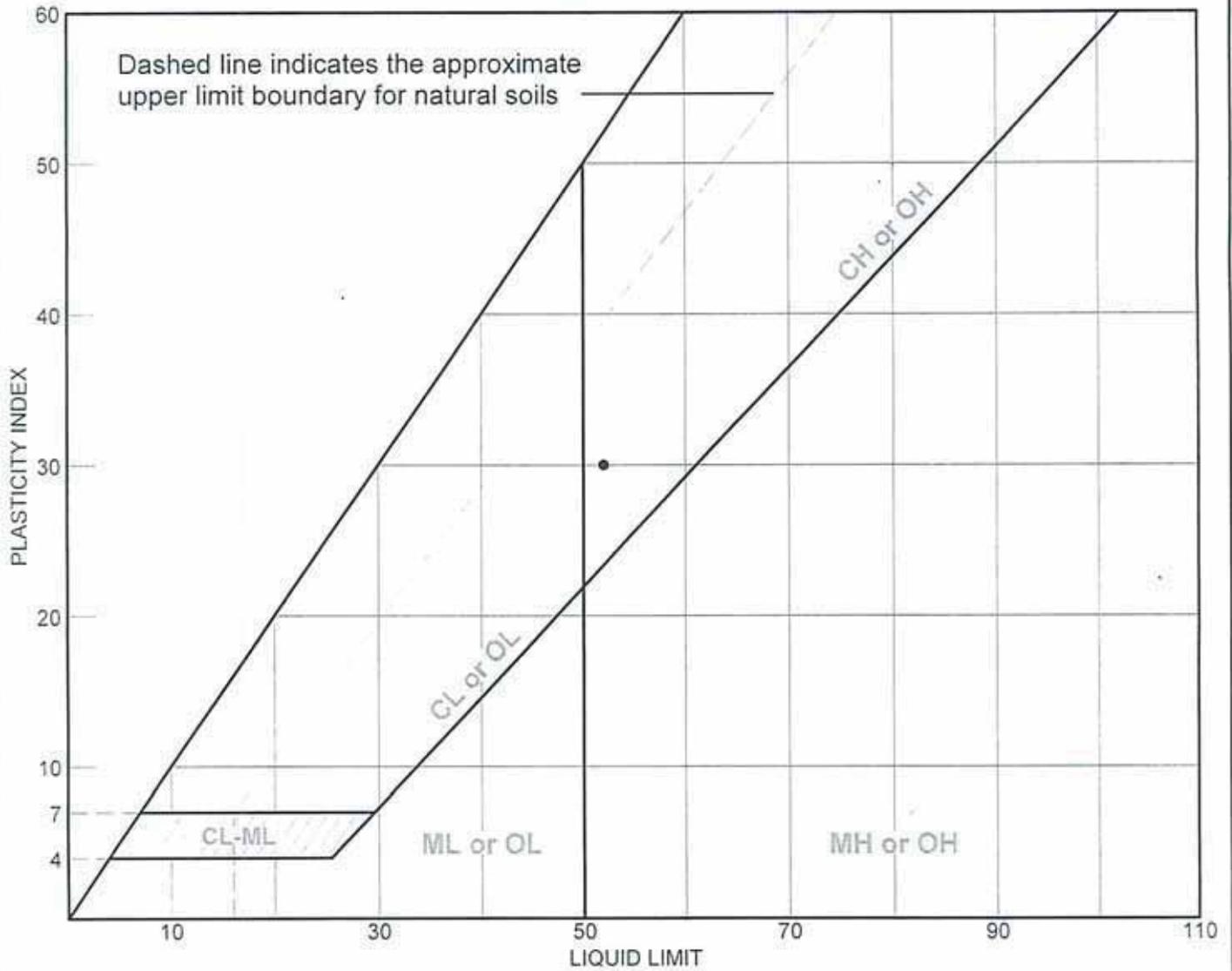
Value of Shrinkage Limit = 23

Value of Shrinkage Ratio = 1.69

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
#4	100.0
#10	100.0
#20	99.9
#40	99.8
#100	99.5
#200	99.2

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

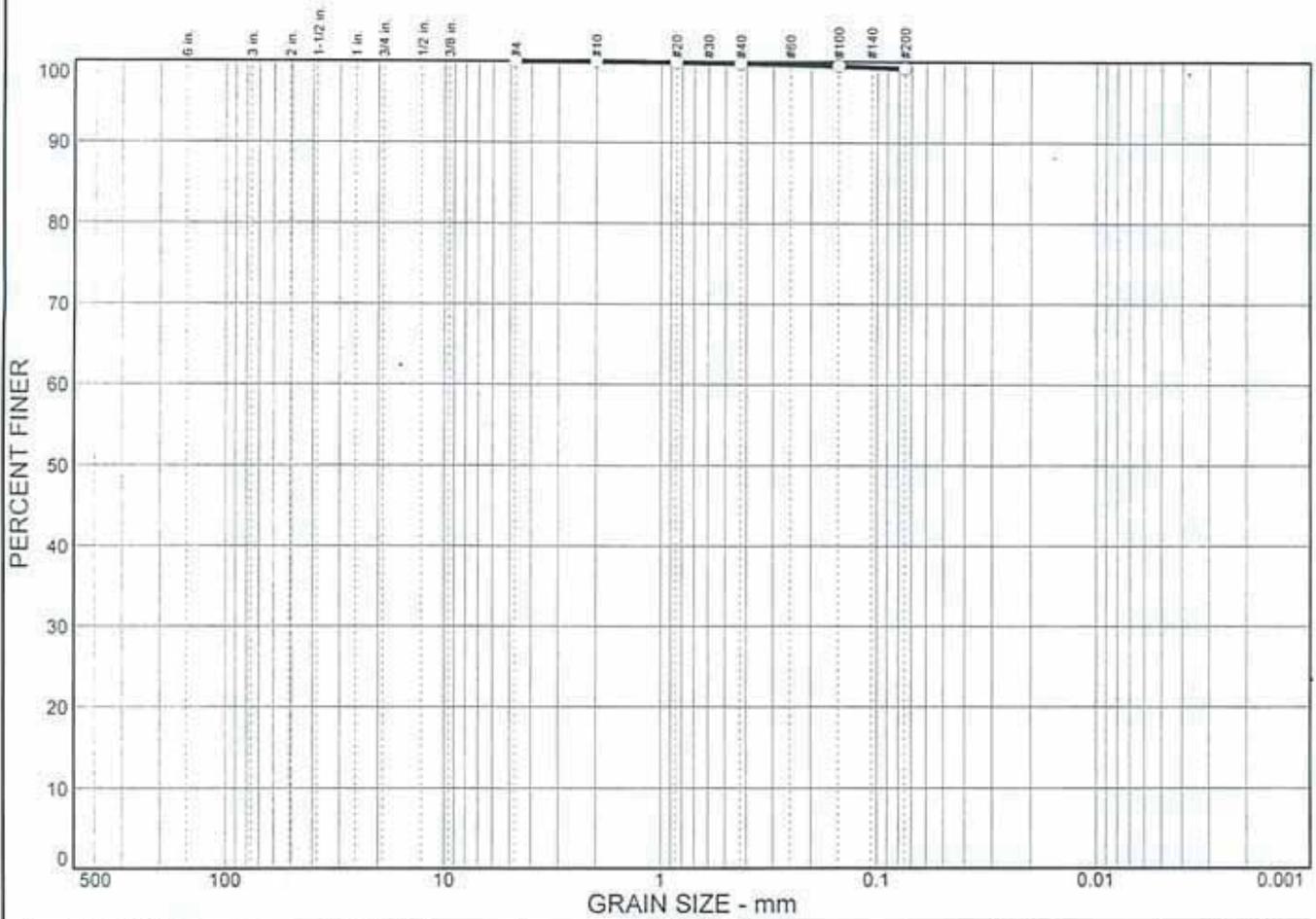


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-22	S-3	4' - 6'	26.5 %	22	52	30	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	0.8	99.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.8		
#100	99.5		
#200	99.2		

Soil Description

B-22, S-3: 4' - 6'

Atterberg Limits

PL= 22 LL= 52 PI= 30

Coefficients

D₈₅= D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-041

* (no specification provided)

Sample No.: S-3
 Location: B-22, S-3: 4' - 6'

Source of Sample: B-22

Date: 1-29-14
 Elev./Depth: 4' - 6'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No: BE-13-192



Western New York Office
5167 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: January 29, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-1

Page 6 of 6

SAMPLE NUMBER: 14-047
SAMPLE LOCATION: B-35, S-7: 15' – 17'

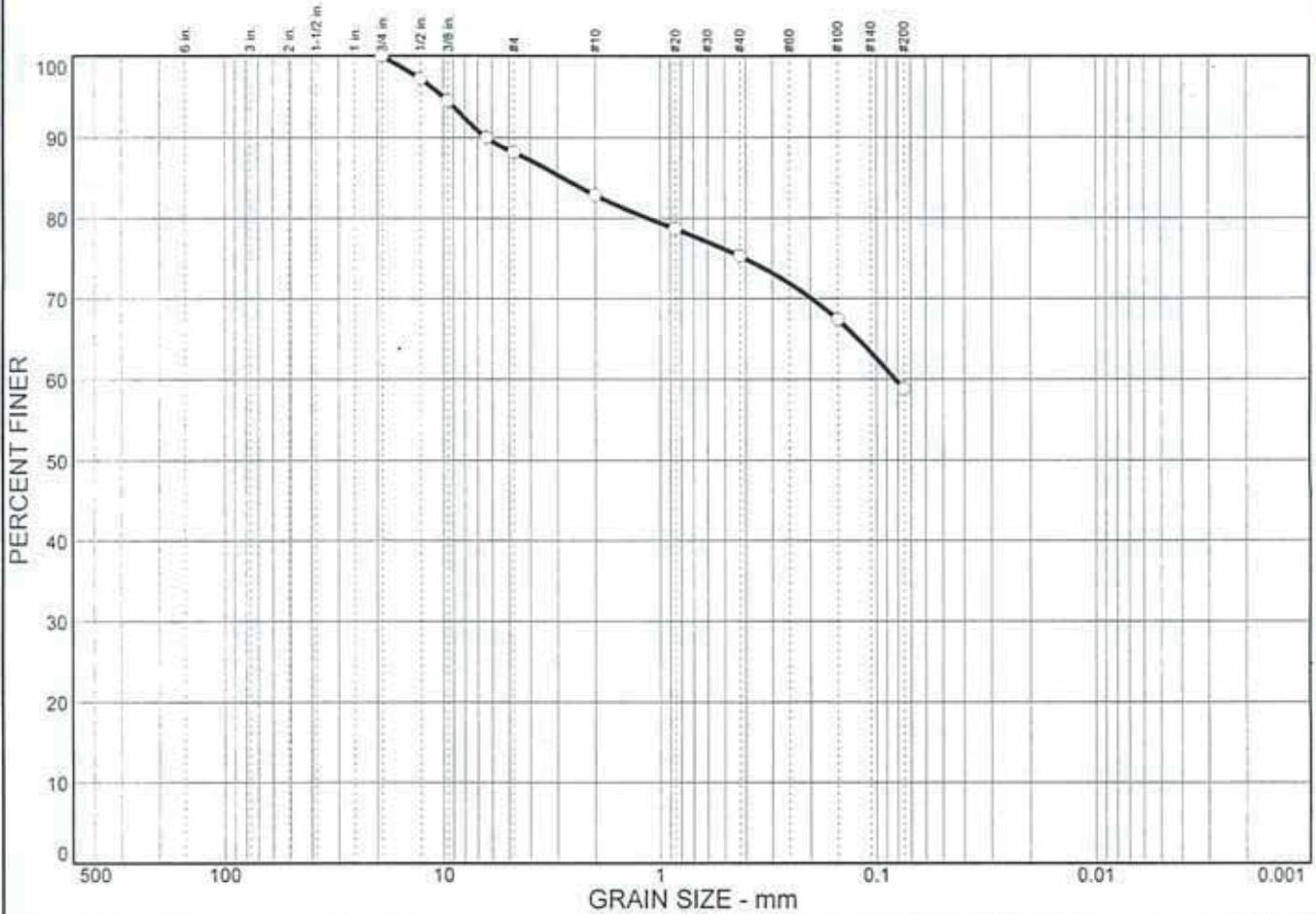
ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

Moisture Content: 8.7 %

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

<i>Sieve Size</i>	<i>Percent Passing</i>
3/4"	100.0
1/2"	97.2
3/8"	94.5
1/4"	90.0
#4	88.2
#10	82.9
#20	78.7
#40	75.3
#100	67.4
#200	58.8

ASTM C-136: Particle Size Distribution Report





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5167 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 6, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Attached are the results of laboratory testing conducted on various samples from the above referenced project. Mr. John Danzer, representing Empire –Geo Services, Inc, chose samples contained in this report.

The testing conducted was as follows:

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Samples were received at the SJB Services, Inc. laboratory on January 27, 2014 where they were processed for testing.

If the reviewer should have any questions concerning this report, please do not hesitate to contact our office at any time.

SJB Services, Inc.

A handwritten signature in black ink, appearing to read 'Paul Gregorczyk', is written over the printed name.

Paul Gregorczyk
Laboratory Manager



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Hamburg, NY 14075
Phone: (716) 649-8110
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Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 6, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 1 of 3

SAMPLE NUMBER: 14-098
SAMPLE LOCATION: B-20, S-5: 8' – 10'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
23.3 %	37	17	20

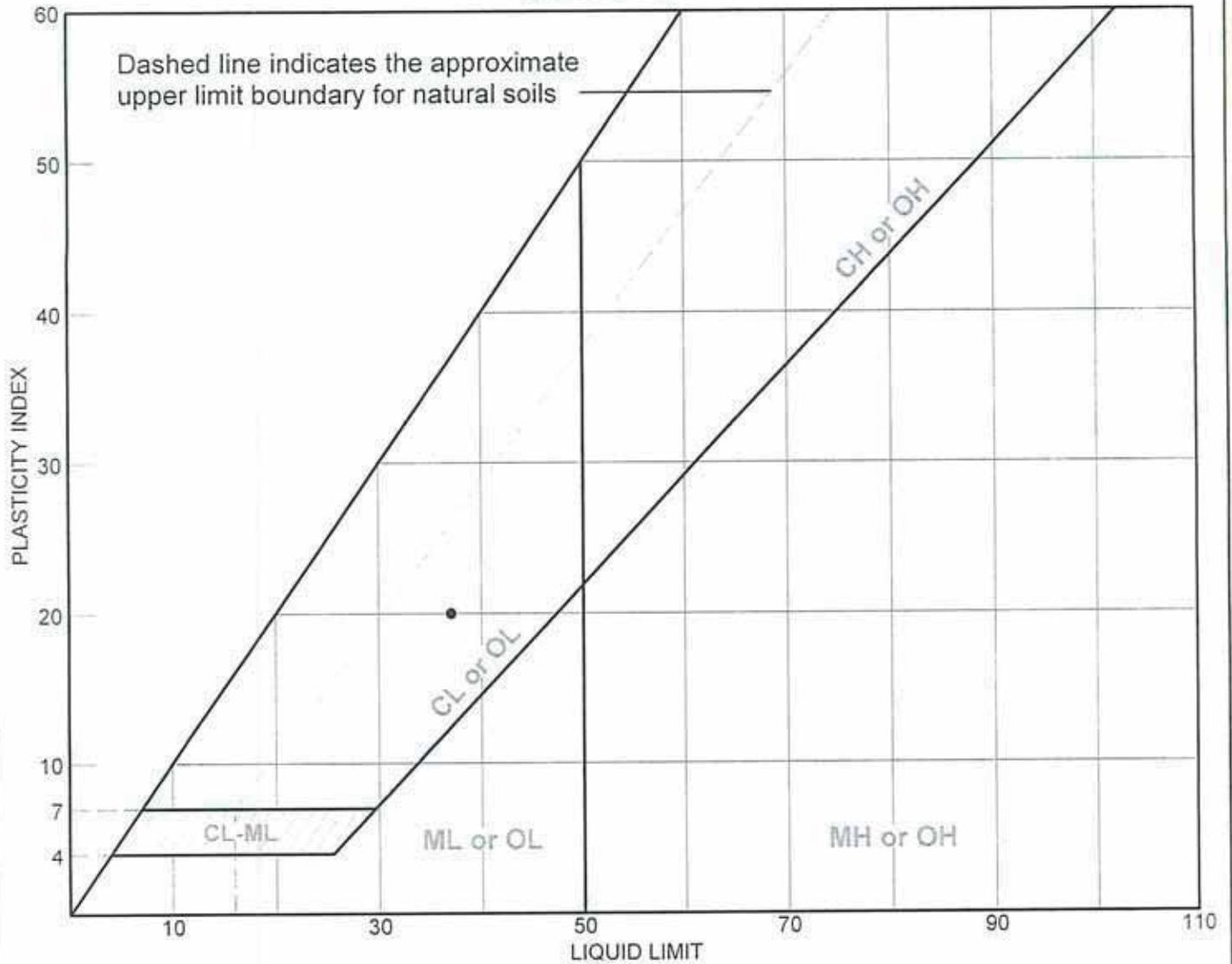
ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 51.6 %
Value of Shrinkage Limit = 19
Value of Shrinkage Ratio = 1.81

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
#4	100.0
#10	99.8
#20	99.7
#40	99.5
#100	99.3
#200	99.0

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

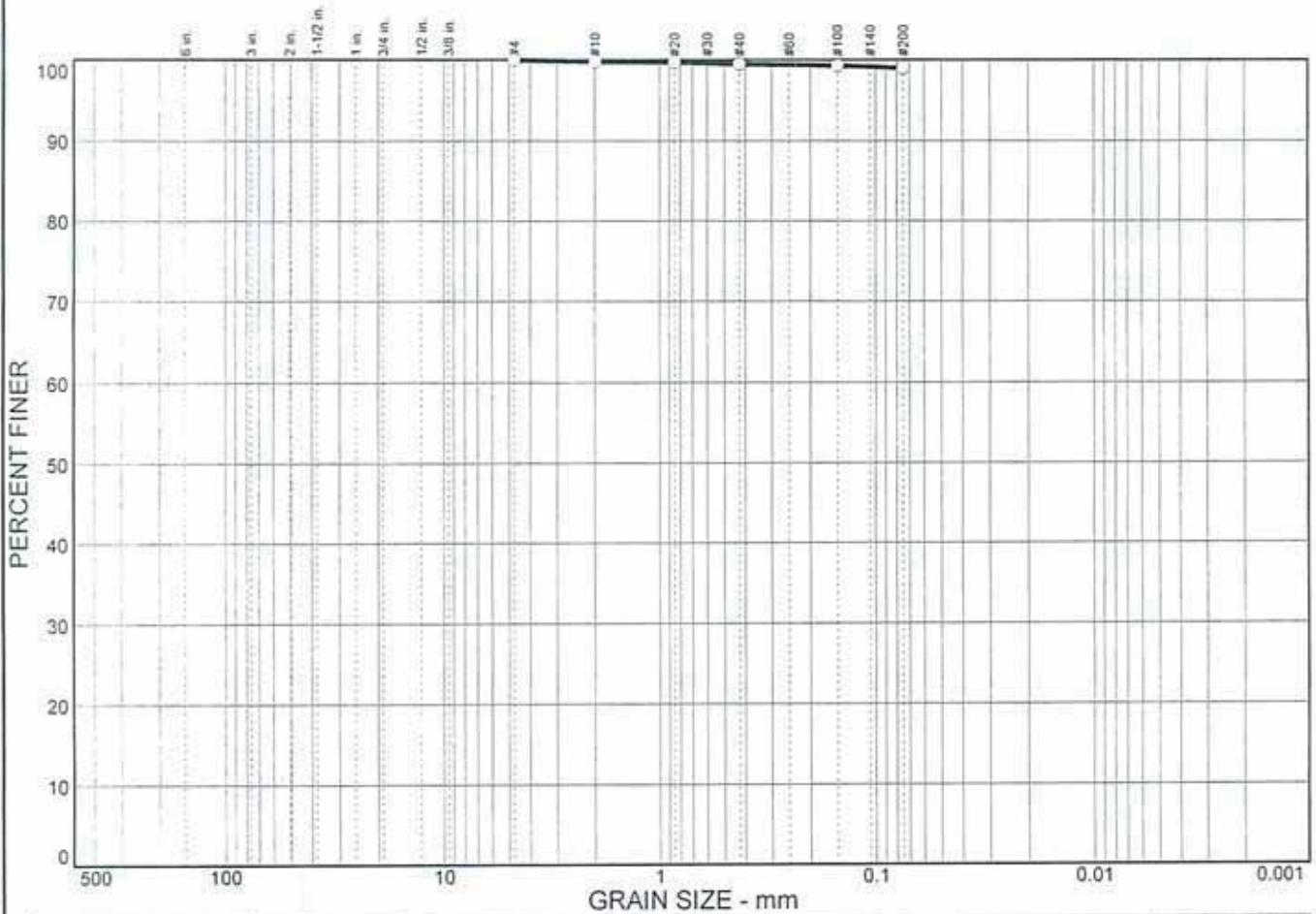


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-20	S-5	8' - 10'	23.3 %	17	37	20	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	1.0	99.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.8		
#20	99.7		
#40	99.5		
#100	99.3		
#200	99.0		

Soil Description

B-20, S-5: 8' - 10'

Atterberg Limits

PL= 17 LL= 37 PI= 20

Coefficients

D₈₅= D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-098

* (no specification provided)

Sample No.: S-5
Location: B-20, S-5: 8' - 10'

Source of Sample: B-20

Date: 2-6-14
Elev./Depth: 8' - 10'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
Project No: BE-13-192



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Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 6, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 2 of 3

SAMPLE NUMBER: 14-099
SAMPLE LOCATION: B-30, S-5: 8' – 10'

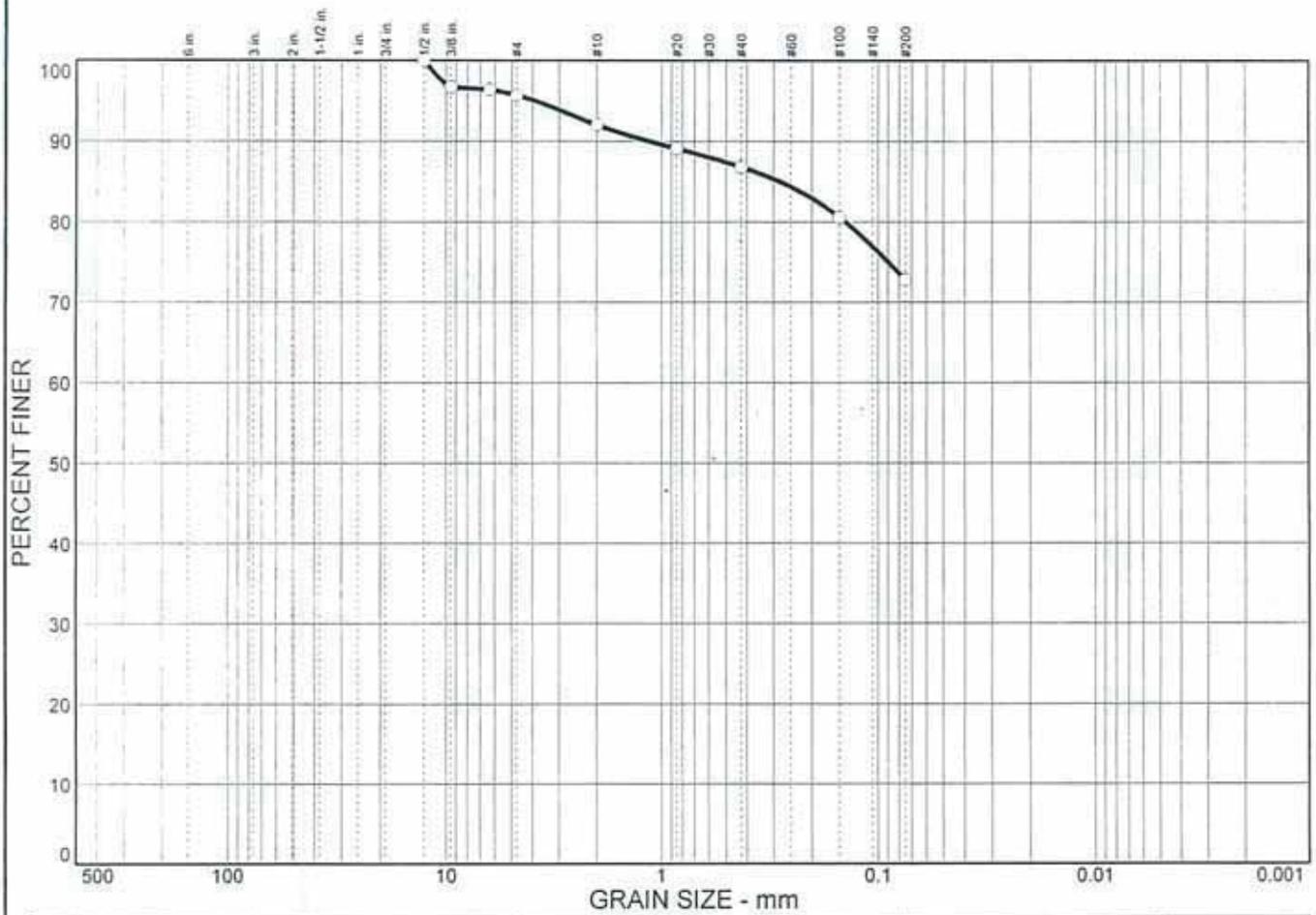
ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content = 11.4 %

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

<i>Sieve Size</i>	<i>Percent Passing</i>
1/2"	100.0
3/8"	96.7
1/4"	96.4
#4	95.7
#10	92.0
#20	89.1
#40	86.8
#100	80.6
#200	72.8

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.3	22.9	72.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	96.7		
.25 in.	96.4		
#4	95.7		
#10	92.0		
#20	89.1		
#40	86.8		
#100	80.6		
#200	72.8		

Soil Description

B-30, S-5: 8' - 10'

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 0.282 D₆₀= D₅₀=

D₃₀= D₁₅= D₁₀=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-099

* (no specification provided)

Sample No.: S-5 Source of Sample: B-30 Date: 2-6-14
 Location: B-30, S-5: 8' - 10' Elev./Depth: 8' - 10'

<h2 style="margin: 0;">SJB SERVICES, INC.</h2>	Client: MENSCH CAPITAL PARTNERS, LLC Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT Project No: BE-13-192
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Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 6, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 3 of 3

SAMPLE NUMBER: 14-100
SAMPLE LOCATION: B-44, S-3: 4' - 6'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
21.3 %	59	22	37

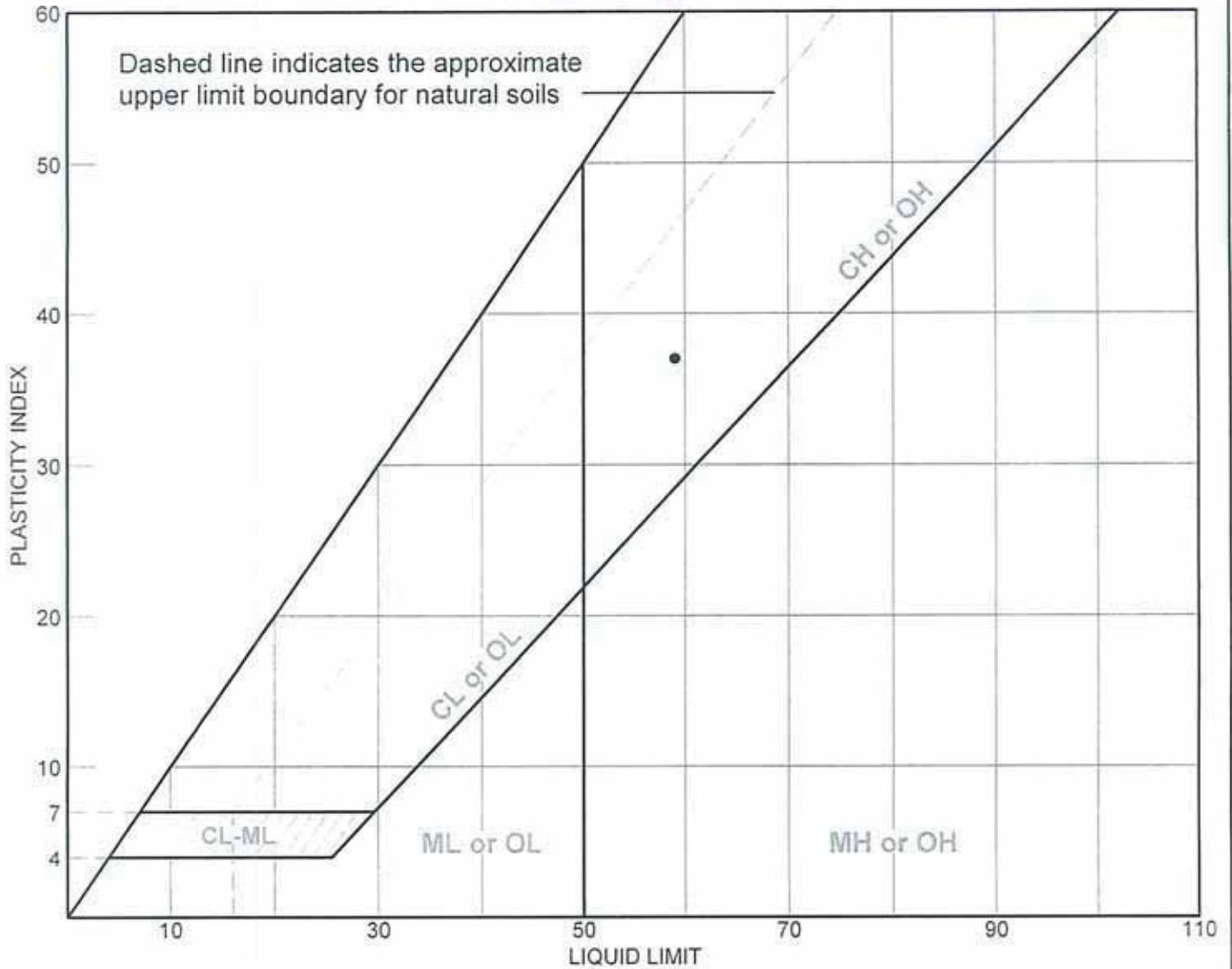
ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 72.6 %
Value of Shrinkage Limit = 22
Value of Shrinkage Ratio = 1.69

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
#4	100.0
#10	100.0
#20	99.8
#40	99.6
#100	99.0
#200	97.8

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-44	S-3	4' - 6'	21.3 %	22	59	37	

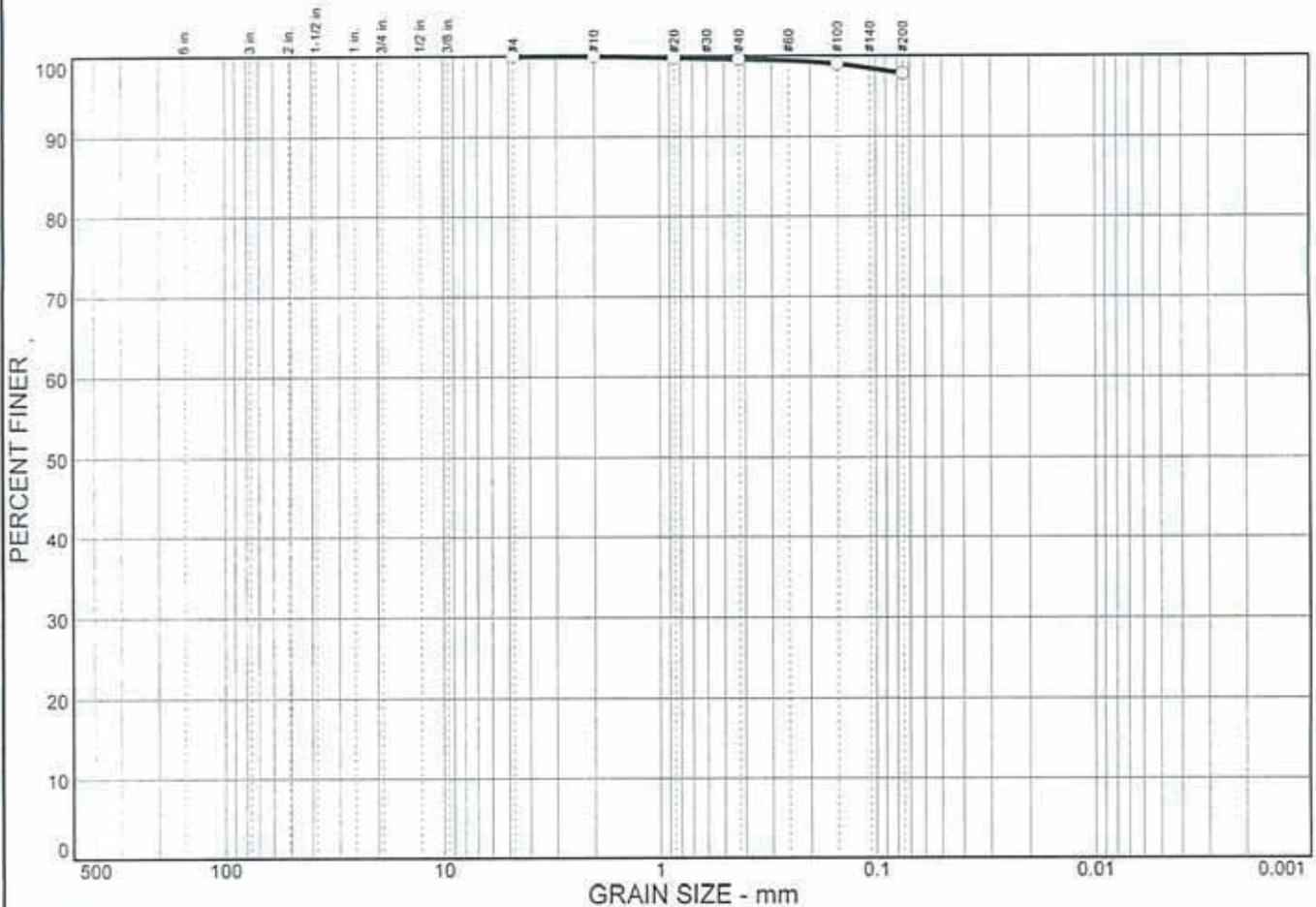
**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC

Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT

Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	2.2	97.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	99.8		
#40	99.6		
#100	99.0		
#200	97.8		

Soil Description

B-44, S-3: 4' - 6'

Atterberg Limits

PL= 22 LL= 59 PI= 37

Coefficients

D₈₅= D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-100

* (no specification provided)

Sample No.: S-3
 Location: B-44, S-3: 4' - 6'

Source of Sample: B-44

Date: 2-6-14
 Elev./Depth: 4' - 6'

<h2 style="margin: 0;">SJB SERVICES, INC.</h2>	Client: MENSCH CAPITAL PARTNERS, LLC Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT Project No: BE-13-192
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Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192
REPORT NO.: LTR-3

Attached are the results of laboratory testing conducted on various samples from the above referenced project. Mr. John Danzer, representing Empire –Geo Services, Inc, chose samples contained in this report.

The testing conducted was as follows:

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Samples were received at the SJB Services, Inc. laboratory on February 7, 2014 where they were processed for testing.

If the reviewer should have any questions concerning this report, please do not hesitate to contact our office at any time.

SJB Services, Inc.


Paul Gregorczyk
Laboratory Manager



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Hamburg, NY 14075
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Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-3

Page 1 of 6

SAMPLE NUMBER: 14-122

SAMPLE LOCATION: B-12, S-3: 4 – 6'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
13.1 %	24	13	11

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 28.5 %

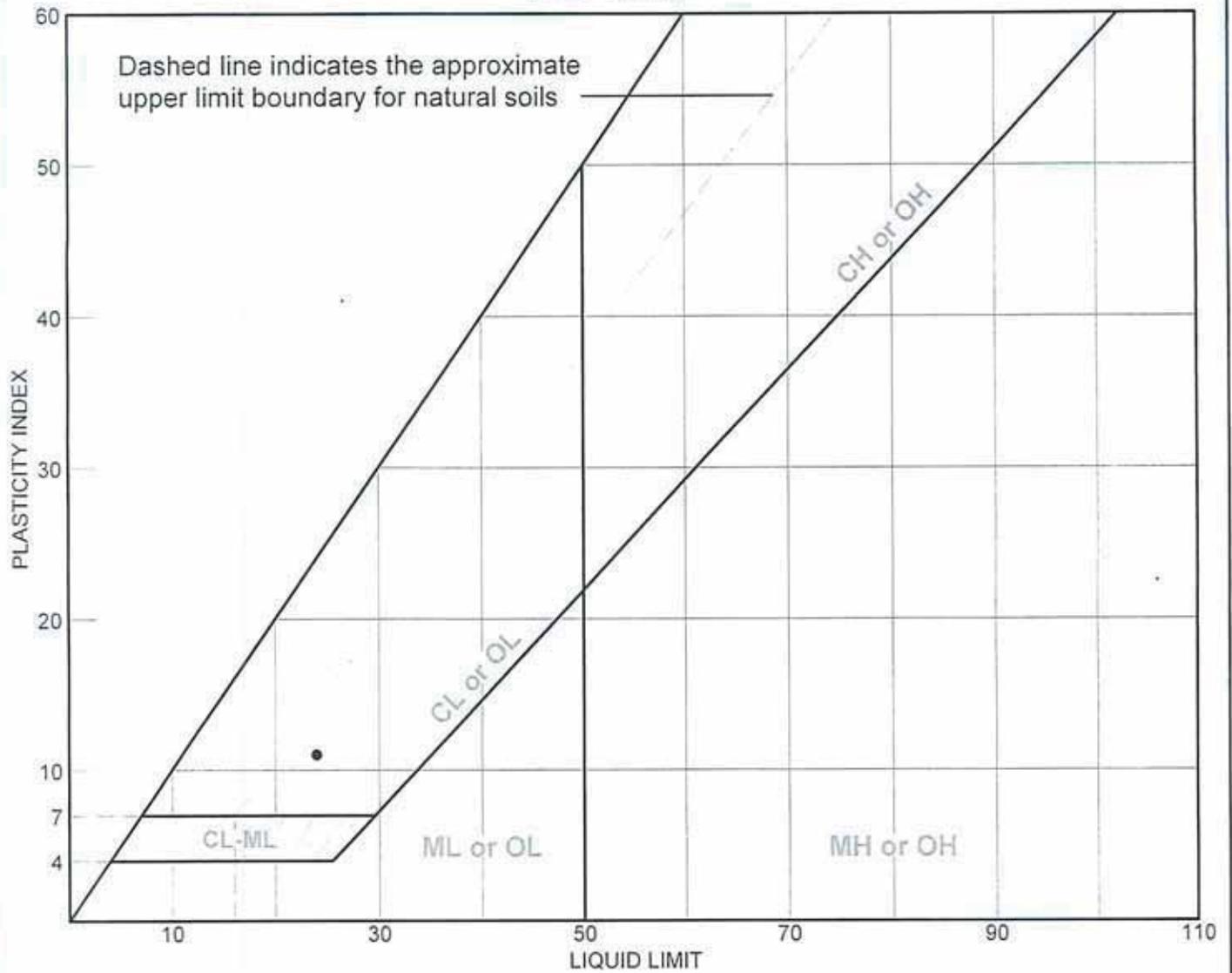
Value of Shrinkage Limit = 12

Value of Shrinkage Ratio = 1.98

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
1/2"	100.0
3/8"	98.0
1/4"	93.5
#4	91.4
#10	87.6
#20	84.5
#40	82.1
#100	75.7
#200	68.2

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-12	S-3	4' - 6'	13.1 %	13	24	11	

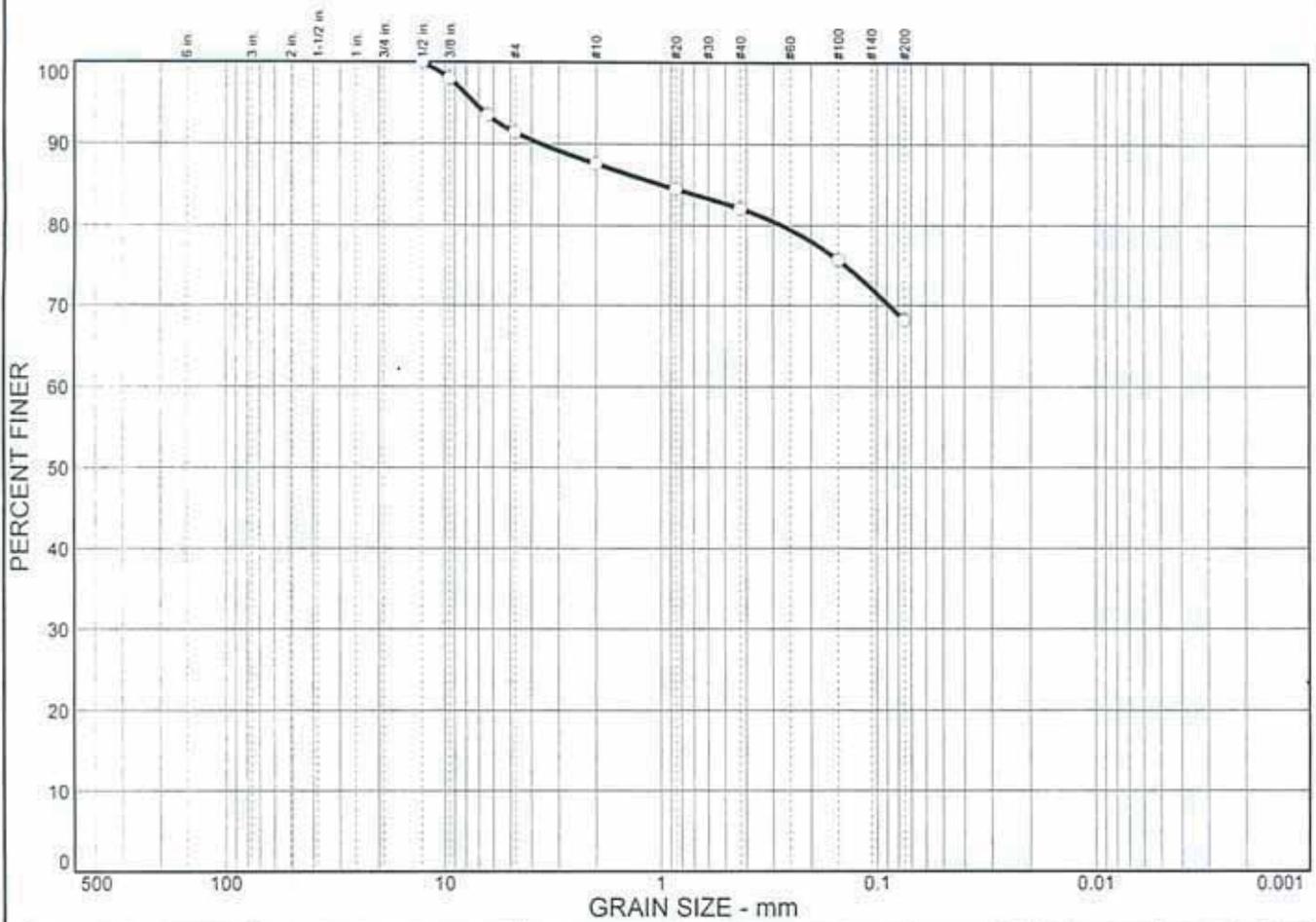
**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC

Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT

Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	8.6	23.2	68.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.0		
.25 in.	93.5		
#4	91.4		
#10	87.6		
#20	84.5		
#40	82.1		
#100	75.7		
#200	68.2		

Soil Description

B-12, S-3: 4' - 6'

Atterberg Limits

PL= 13 LL= 24 PI= 11

Coefficients

D₈₅= 0.983 D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-122

* (no specification provided)

Sample No.: S-3
 Location: B-12, S-3: 4' - 6'

Source of Sample: B-12

Date: 2-14-14
 Elev./Depth: 4' - 6'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No: BE-13-192



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 2 of 6

SAMPLE NUMBER: 14-123
SAMPLE LOCATION: B-31, S-6: 10' - 12'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
10.7 %	23	13	10

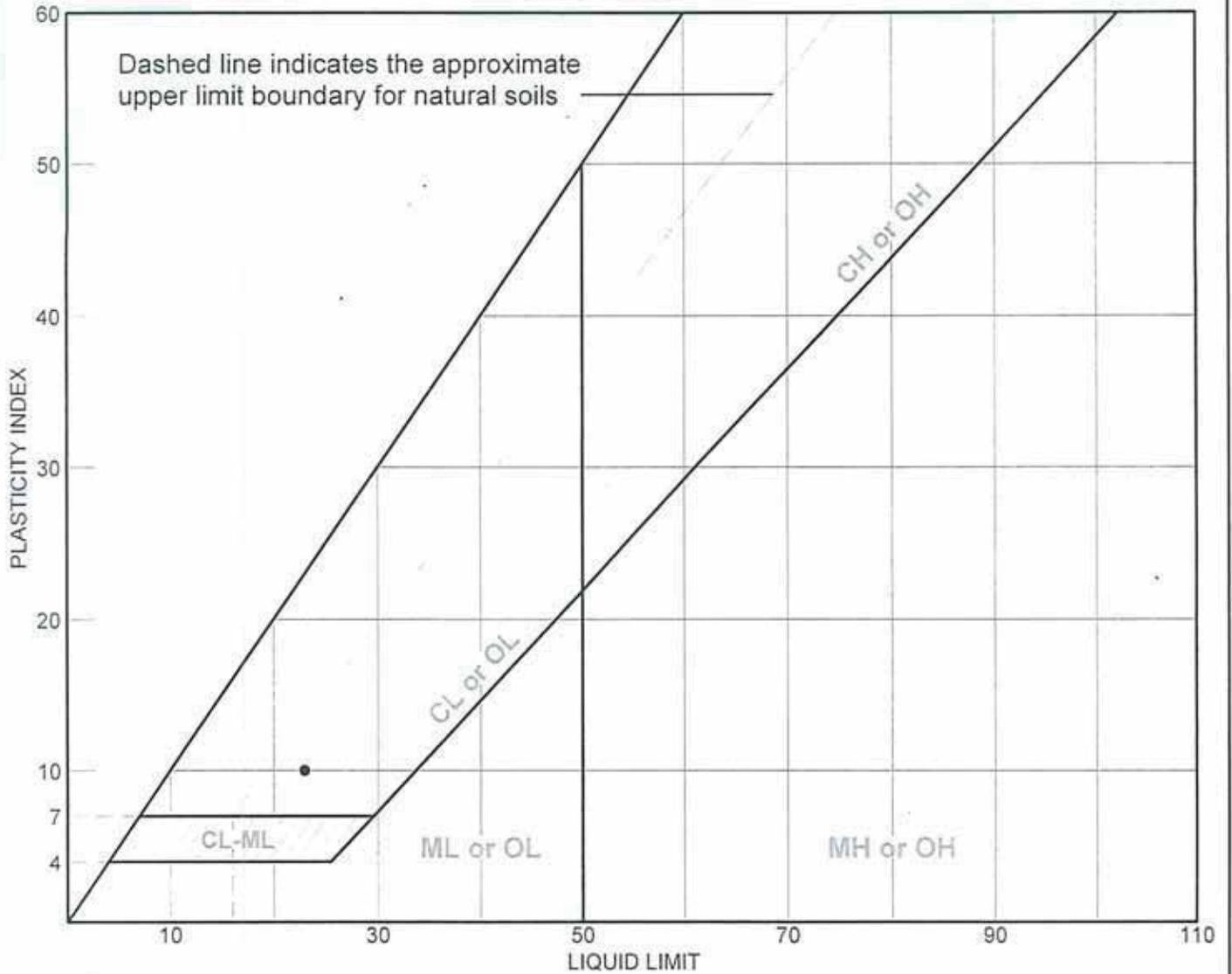
ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 43.0 %
Value of Shrinkage Limit = 12
Value of Shrinkage Ratio = 1.94

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
¾"	100.0
½"	96.5
⅜"	94.4
¼"	92.2
#4	90.9
#10	87.1
#20	84.5
#40	82.4
#100	76.4
#200	69.3

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

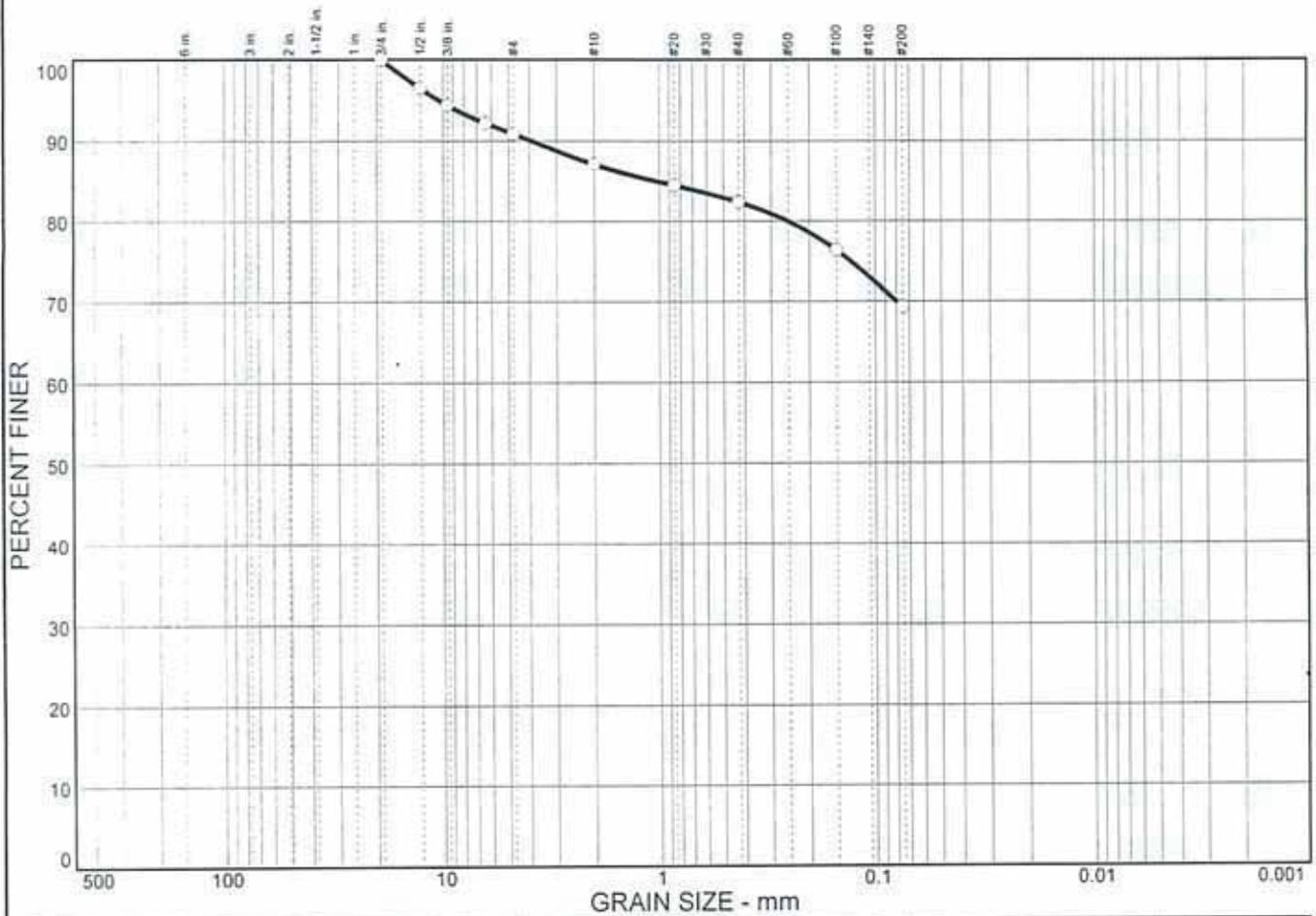


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-31	S-6	10' - 12'	10.7%	13	23	10	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	9.1	21.6	69.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	96.5		
.375 in.	94.4		
.25 in.	92.2		
#4	90.9		
#10	87.1		
#20	84.5		
#40	82.4		
#100	76.4		
#200	69.3		

Soil Description

B-31, S-6: 10' - 12'

Atterberg Limits

PL= 13 LL= 23 PI= 10

Coefficients

D₈₅= 1.02 D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-123

* (no specification provided)

Sample No.: S-6
 Location: B-31, S-6: 10' - 12'

Source of Sample: B-31

Date: 2-14-14
 Elev./Depth: 10' - 12'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT

Project No: BE-13-192



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Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 3 of 6

SAMPLE NUMBER: 14-124

SAMPLE LOCATION: B-38, S-2: 2' - 4'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
21.3 %	44	20	24

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 51.2 %

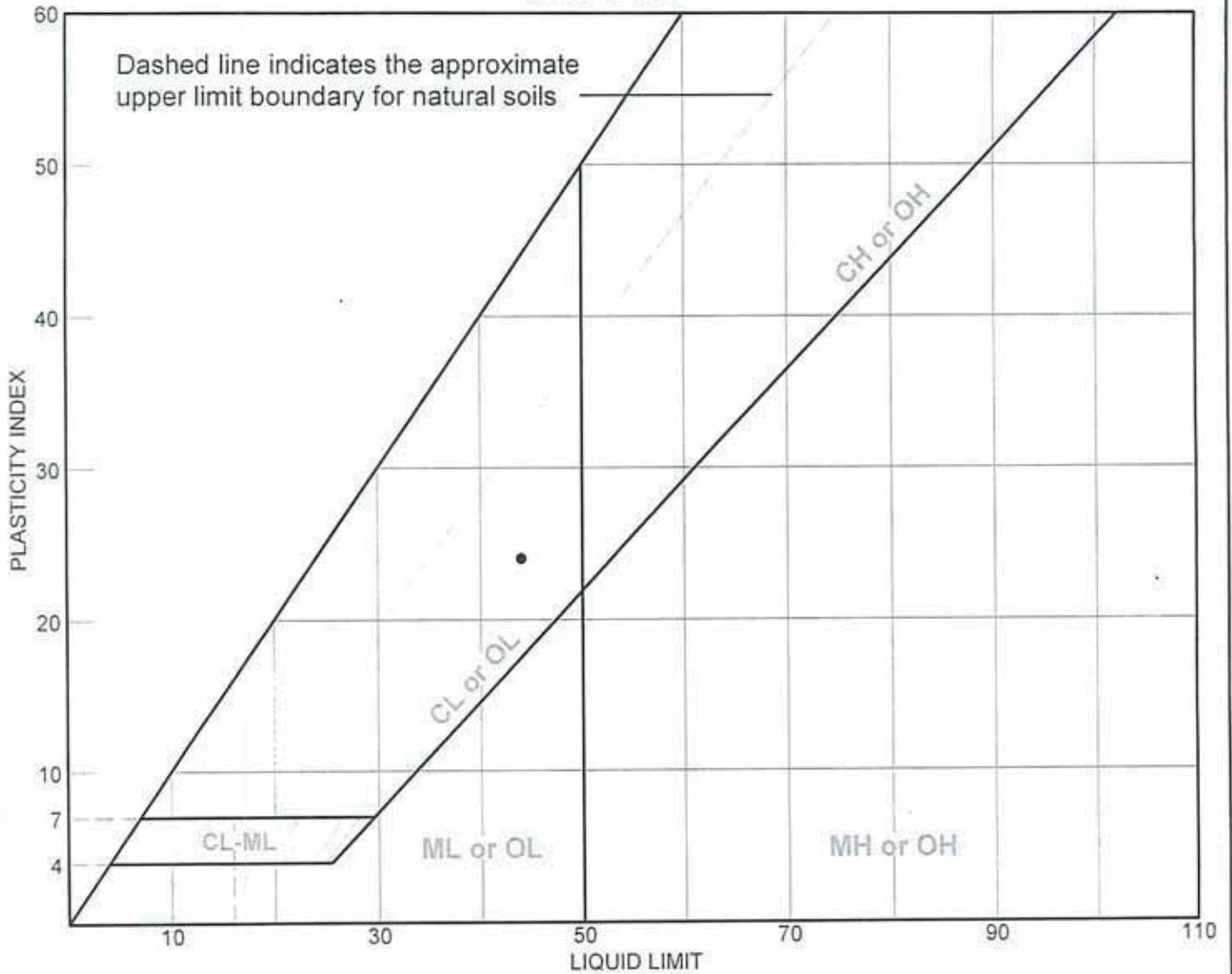
Value of Shrinkage Limit = 20

Value of Shrinkage Ratio = 1.64

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
#4	100.0
#10	99.6
#20	99.2
#40	98.7
#100	97.3
#200	96.2

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

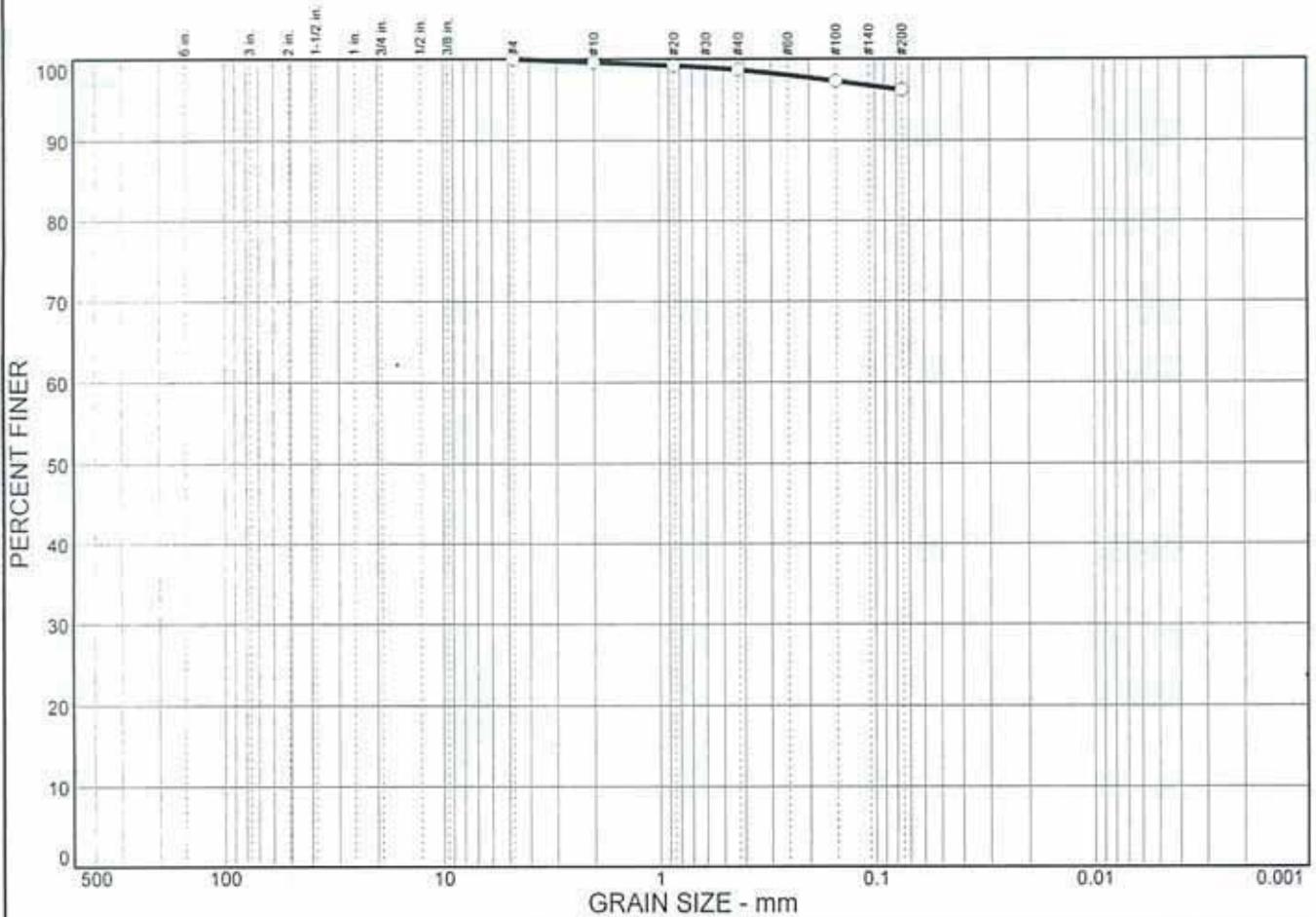


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-38	S-2	2' - 4'	21.3 %	20	44	24	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	3.8	96.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.6		
#20	99.2		
#40	98.7		
#100	97.3		
#200	96.2		

Soil Description

B-38, S-2: 2' - 4'

Atterberg Limits

PL= 20 LL= 44 PI= 24

Coefficients

D₈₅= D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-124

(no specification provided)

Sample No.: S-2
 Location: B-38, S-2: 2' - 4'

Source of Sample: B-38

Date: 2-14-14
 Elev./Depth: 2' - 4'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No: BE-13-192



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 4 of 6

SAMPLE NUMBER: 14-125

SAMPLE LOCATION: B-40, S-4: 6' - 8'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
12.0 %	25	14	11

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 31.5 %

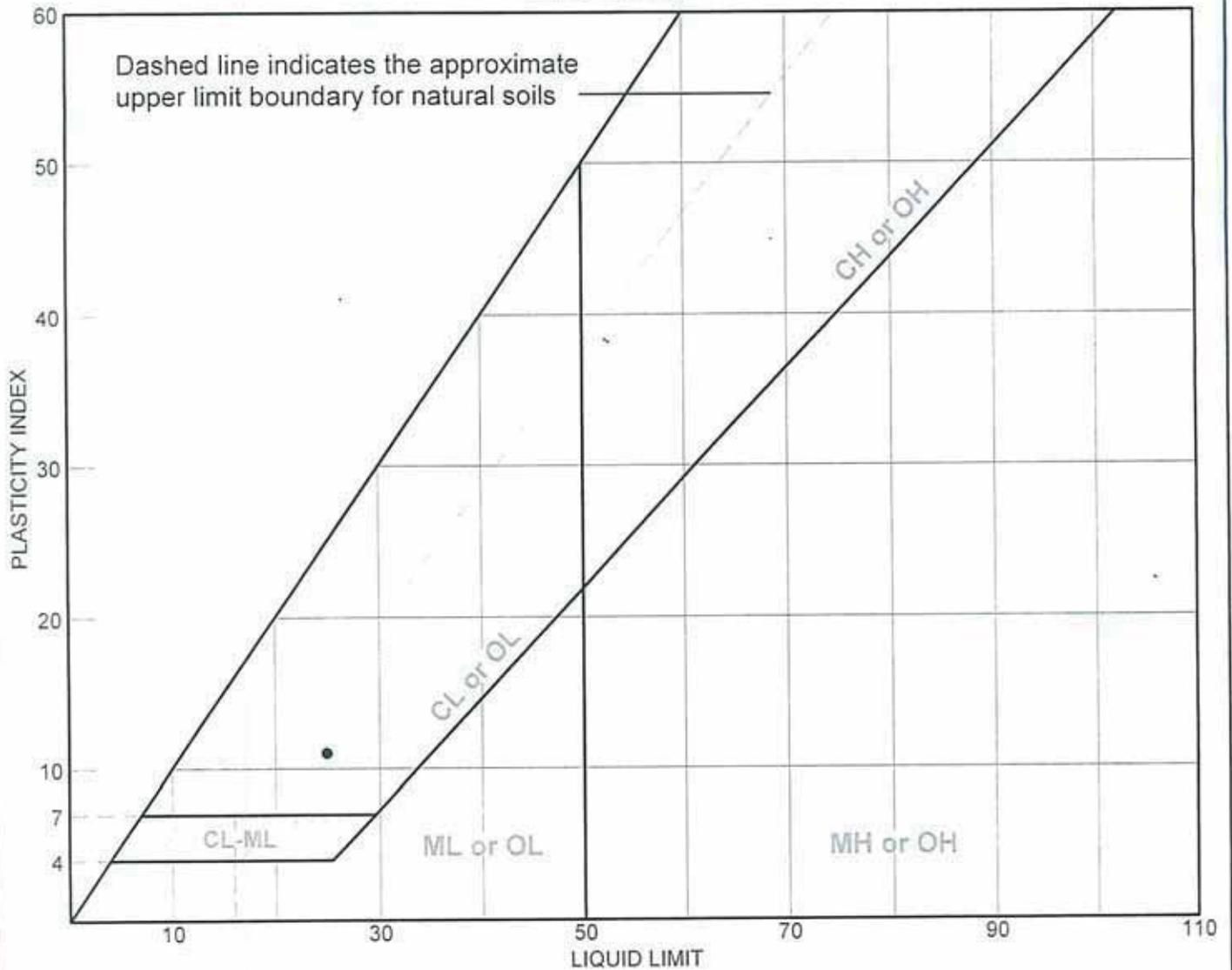
Value of Shrinkage Limit = 13

Value of Shrinkage Ratio = 1.95

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
3/8"	100.0
1/4"	98.8
#4	97.8
#10	95.8
#20	94.0
#40	92.6
#100	88.6
#200	83.0

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

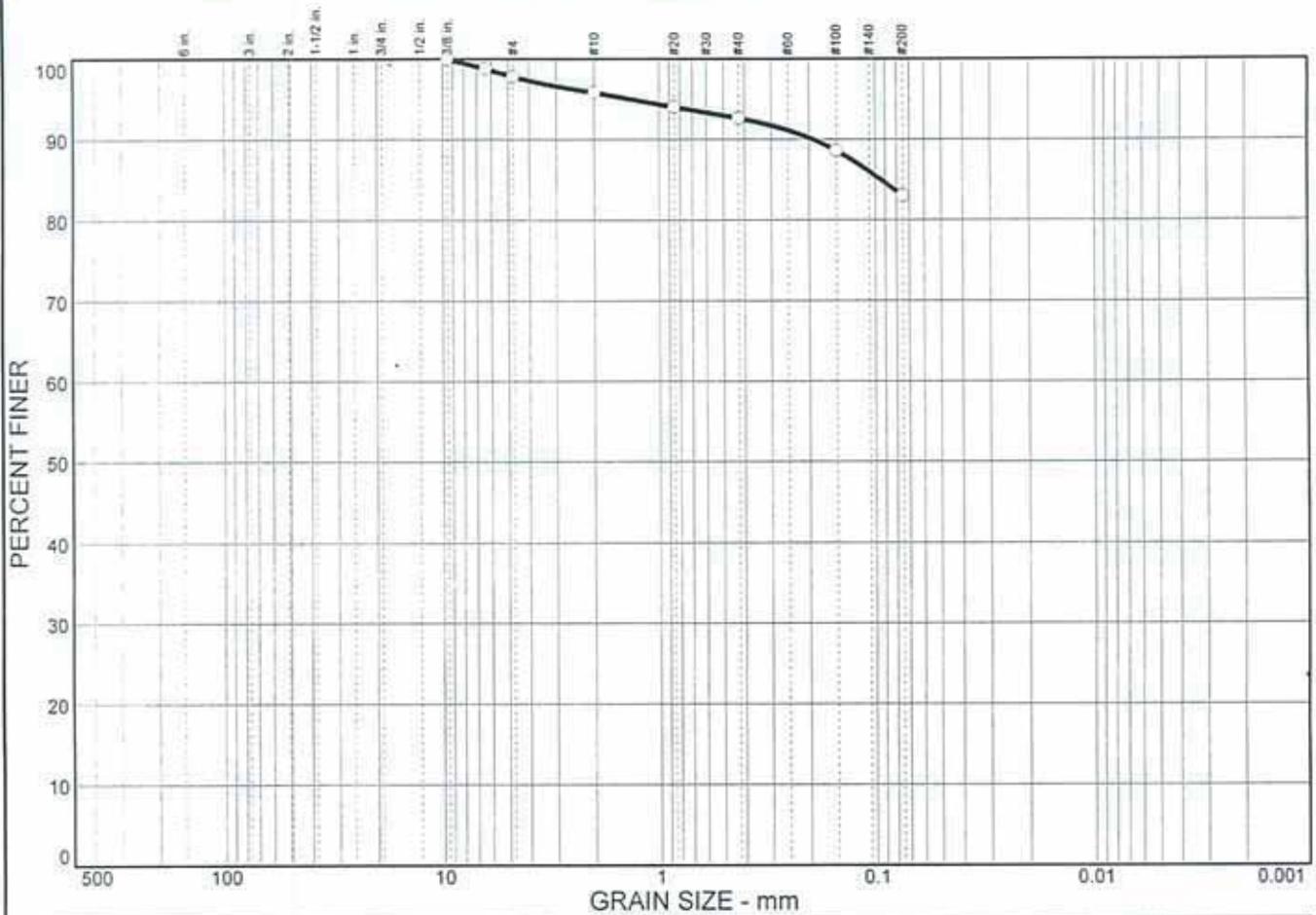


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-40	S-4	6' - 8'	12.0 %	14	25	11	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.2	14.8	83.0	0.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
.25 in.	98.8		
#4	97.8		
#10	95.8		
#20	94.0		
#40	92.6		
#100	88.6		
#200	83.0		

Soil Description

B-40, S-4: 6' - 8'

Atterberg Limits

PL= 14 LL= 25 PI= 11

Coefficients

D₈₅= 0.0941 D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-125

* (no specification provided)

Sample No.: S-4 Source of Sample: B-40 Date: 2-14-14
 Location: B-40, S-4: 6' - 8' Elev./Depth: 6' - 8'

<h2 style="margin: 0;">SJB SERVICES, INC.</h2>	Client: MENSCH CAPITAL PARTNERS, LLC Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT Project No: BE-13-192
--	---



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 5 of 6

SAMPLE NUMBER: 14-126

SAMPLE LOCATION: B-46, S-3: 4' - 6'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
28.1 %	61	25	36

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 66.6 %

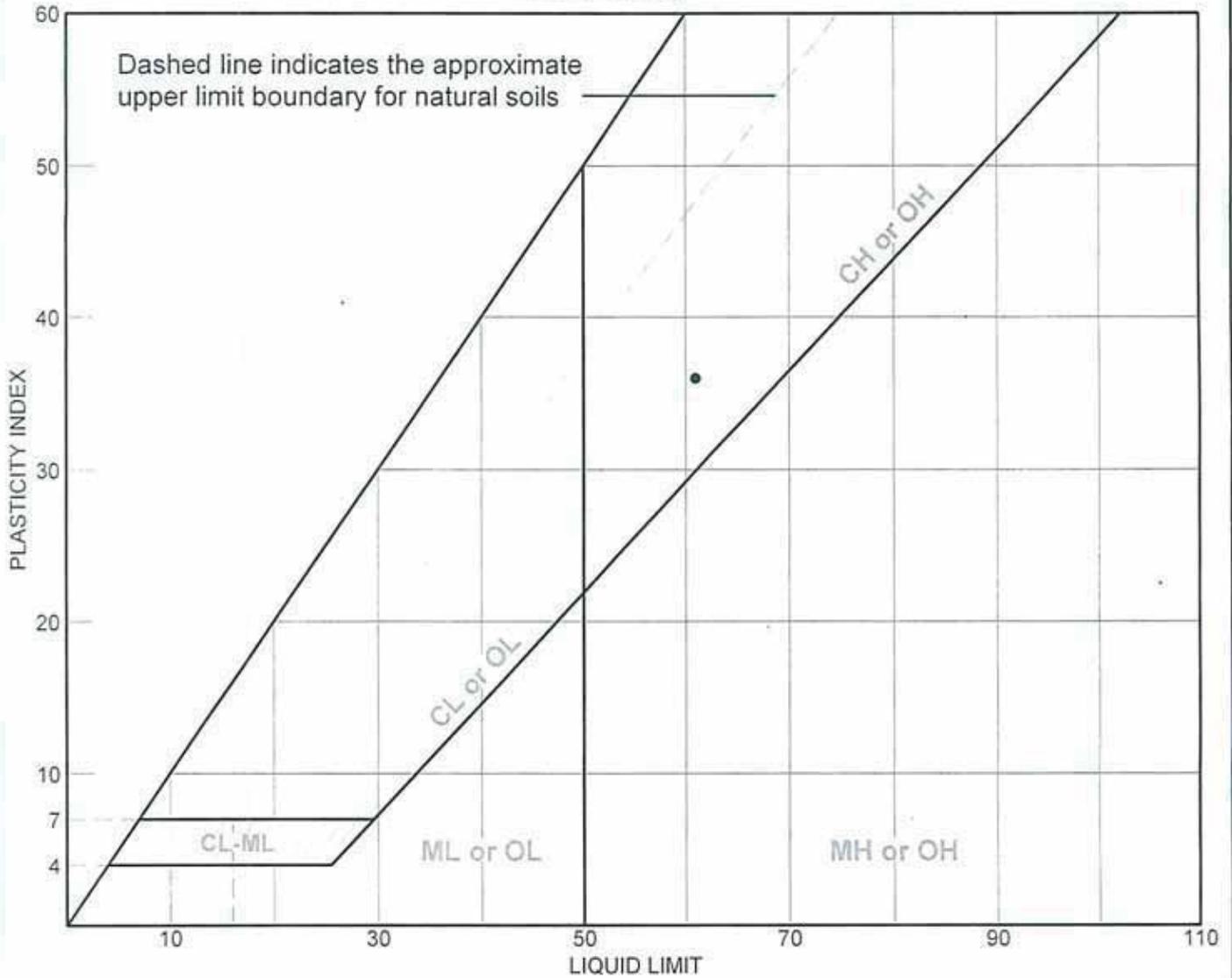
Value of Shrinkage Limit = 22

Value of Shrinkage Ratio = 1.65

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

<i>Sieve Size</i>	<i>Percent Passing</i>
#4	100.0
#10	99.9
#20	99.9
#40	99.7
#100	99.4
#200	99.2

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

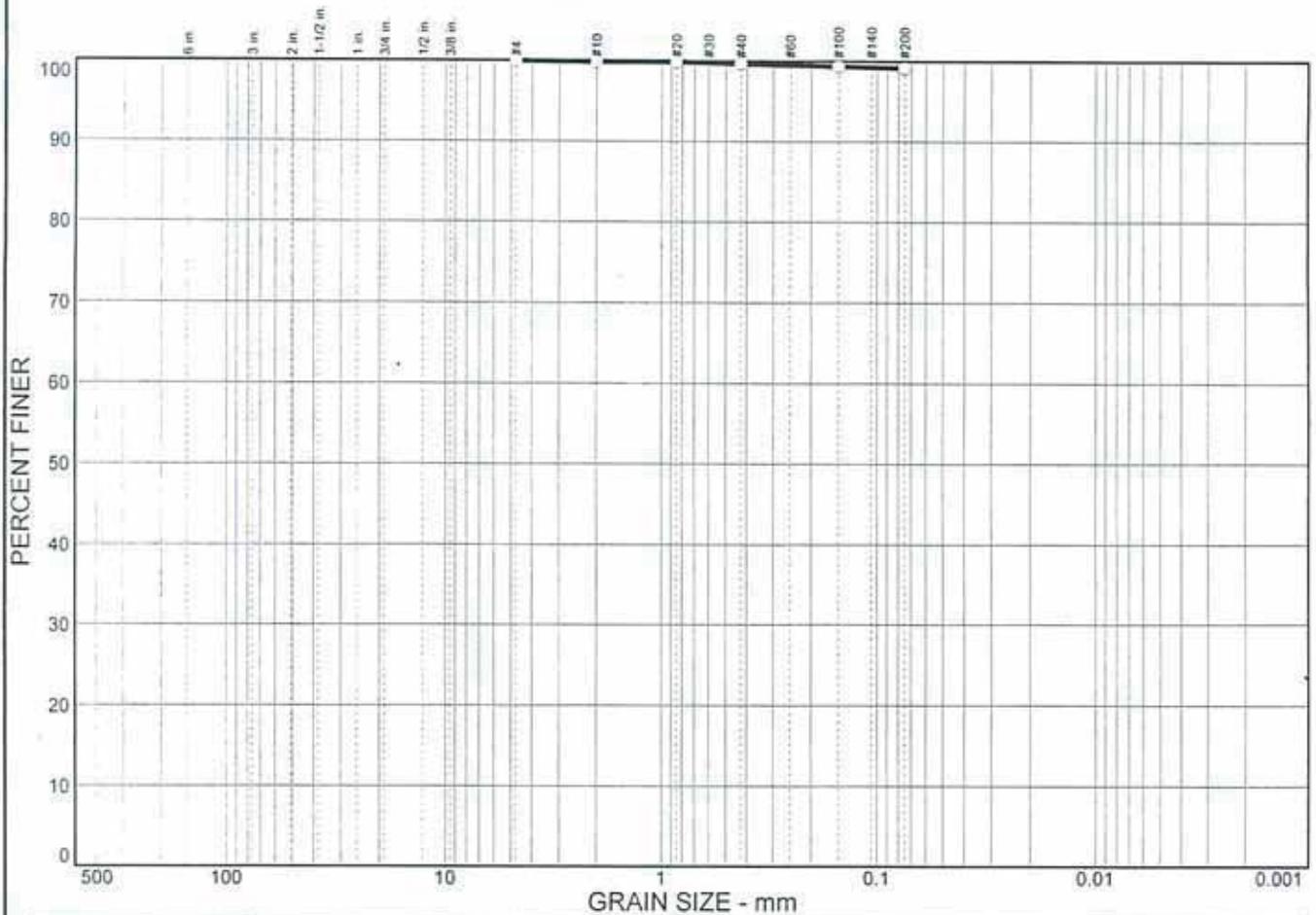


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-46	S-3	4' - 6'	28.1 %	25	61	36	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	0.8	99.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	99.9		
#40	99.7		
#100	99.4		
#200	99.2		

Soil Description

B-46, S-3: 4' - 6'

Atterberg Limits

PL= 25 LL= 61 PI= 36

Coefficients

D₈₅= D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-126

* (no specification provided)

Sample No.: S-3
Location: B-46, S-3: 4' - 6'

Source of Sample: B-46

Date: 2-14-14
Elev./Depth: 4' - 6'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
Project No: BE-13-192



Laboratory Test Report

PROJECT: Proposed Westwood Country Club Development Project

CLIENT: Mensch Capital Partners, LLC.

DATE: February 14, 2014

PROJECT NO.: BE-13-192

REPORT NO.: LTR-2

Page 6 of 6

SAMPLE NUMBER: 14-127

SAMPLE LOCATION: B-48, S-5: 8' - 10'

ASTM D-2216: Laboratory Determination of Water (Moisture) Content of Soil & Rock

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Moisture Content	Liquid Limit	Plastic Limit	Plasticity Index
11.8 %	23	13	10

ASTM D-427: Shrinkage Factors of Soils by the Mercury Method

Value of Initial Water Content = 34.4 %

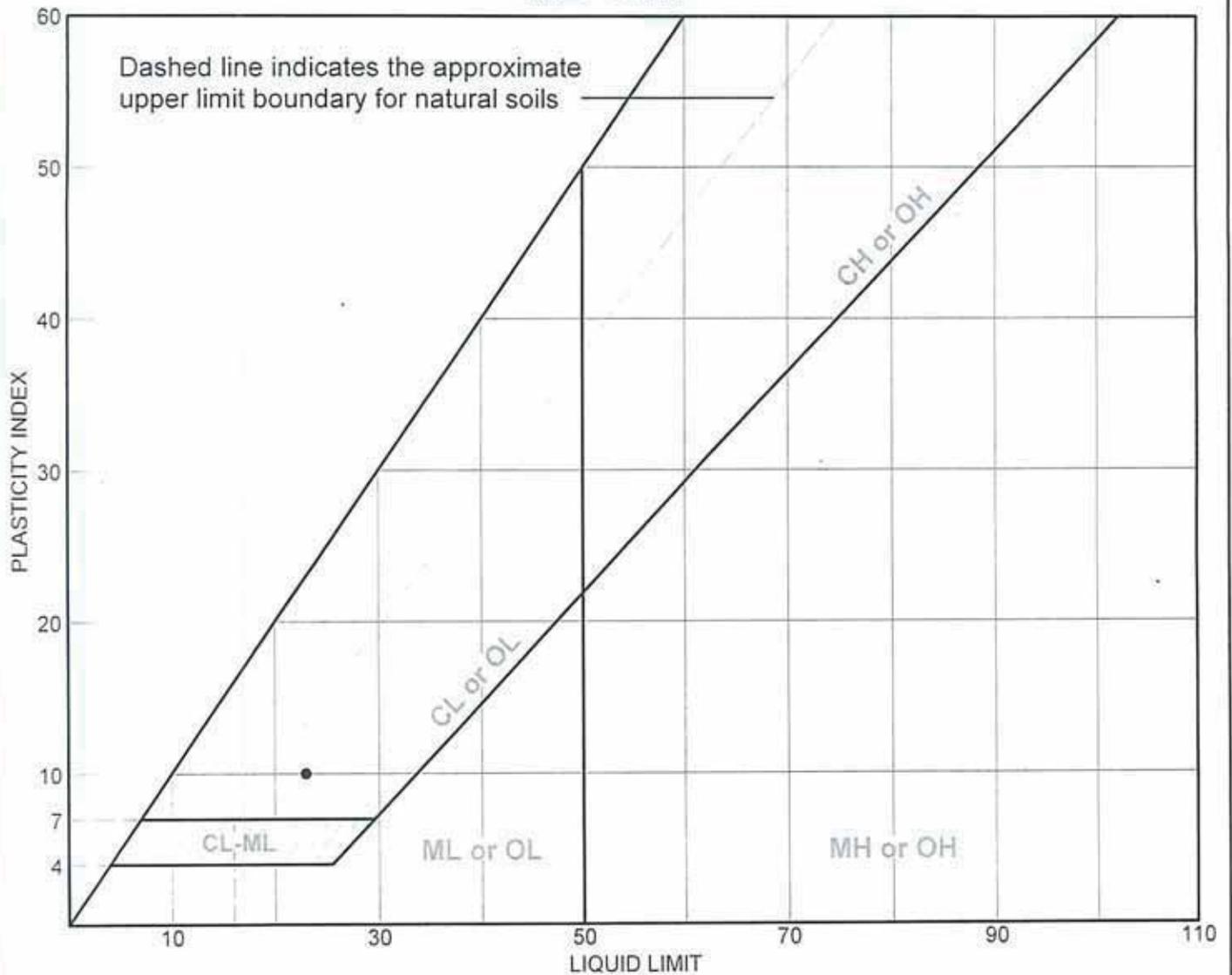
Value of Shrinkage Limit = 14

Value of Shrinkage Ratio = 1.94

ASTM C-136: Sieve Analysis of Fine and Coarse Aggregates

Sieve Size	Percent Passing
3/8"	100.0
1/4"	97.9
#4	96.2
#10	93.0
#20	90.5
#40	88.5
#100	83.5
#200	77.1

SJB SERVICES, INC. LIQUID AND PLASTIC LIMITS TEST REPORT

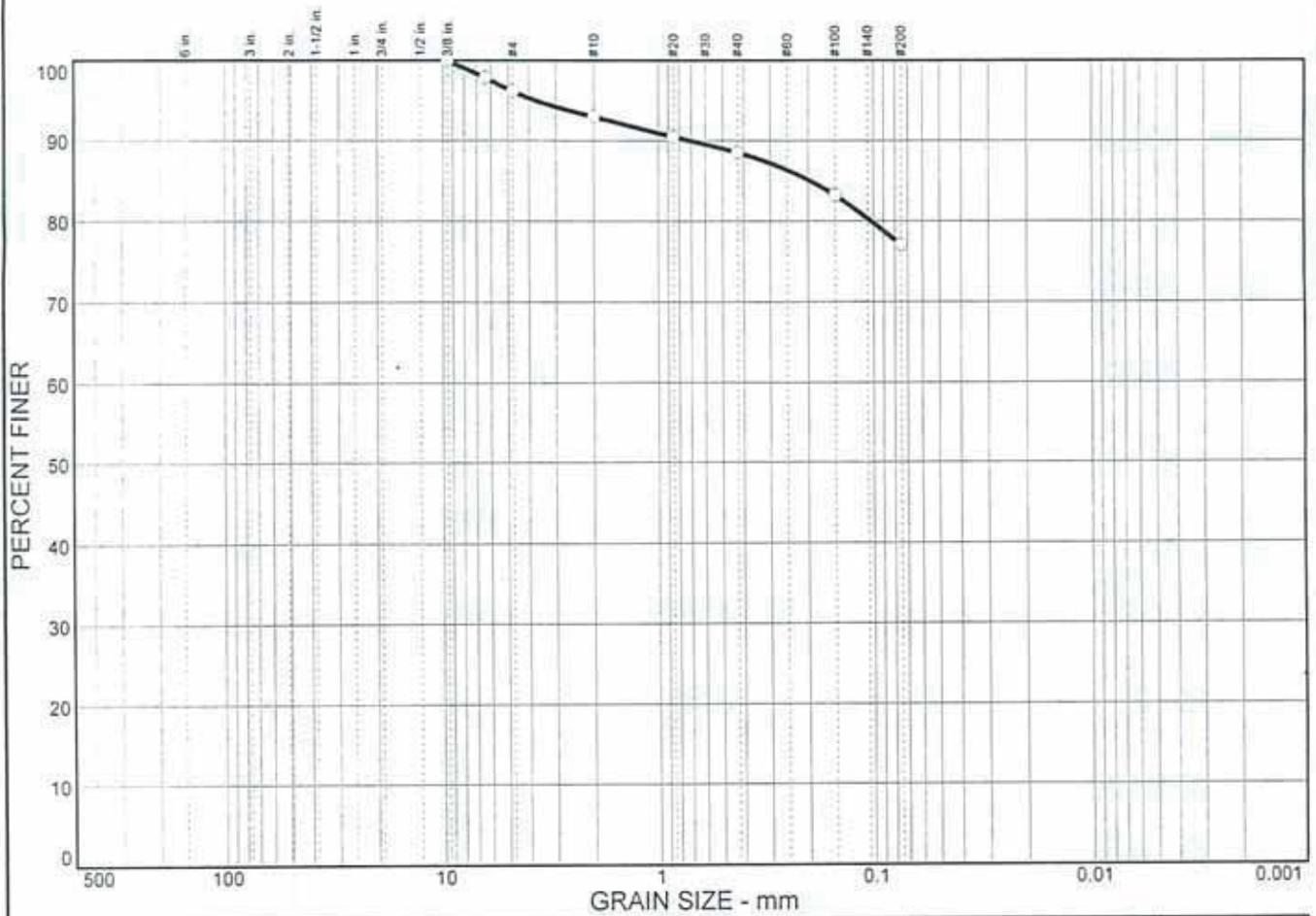


SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	B-48	S-5	8' - 10'	11.8 %	13	23	10	

**SJB
SERVICES, INC.**

Client: MENSCH CAPITAL PARTNERS, LLC
Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
Project No.: BE-13-192

ASTM C-136: Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	3.8	19.1	77.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
.25 in.	97.9		
#4	96.2		
#10	93.0		
#20	90.5		
#40	88.5		
#100	83.2		
#200	77.1		

Soil Description

B-48, S-5: 8' - 10'

Atterberg Limits

PL= 13 LL= 23 PI= 10

Coefficients

D₈₅= 0.196 D₆₀= D₅₀=
D₃₀= D₁₅= D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

SAMPLE NUMBER: 14-128

* (no specification provided)

Sample No.: S-5
 Location: B-48, S-5: 8' - 10'

Source of Sample: B-48

Date: 2-14-14
 Elev./Depth: 8' - 10'

SJB SERVICES, INC.

Client: MENSCH CAPITAL PARTNERS, LLC
 Project: WESTWOOD COUNTRY CLUB DEVELOPMENT PROJECT
 Project No: BE-13-192



Contract
Drilling
and
Testing

Rochester Office
535 Summit Point Drive
Henrietta, NY 14467
Phone: 585-359-2730
Fax: 585-359-9668

Summary of Laboratory Testing

Project: Westwood Country Club Development Project Date: 02-03-2014
Client: Mensch Capital Partners
Project Number: BE-13-192

Lab Id#	Location	Depth (ft)	Moisture Content (%)
14-035	B-6, S-2	2 - 4	4.5
14-036	B-6, S-3	4 - 6	11.3
14-037	B-6, S-4	6 - 8	10.3
14-042	B-34, S-2	2 - 4	6.1
14-043	B-34, S-3	4 - 6	5.9
14-044	B-34, S-4	6 - 8	12.0
14-045	B-34, S-5	8 - 10	10.1

SJB Laboratory Technician: William Gilmore

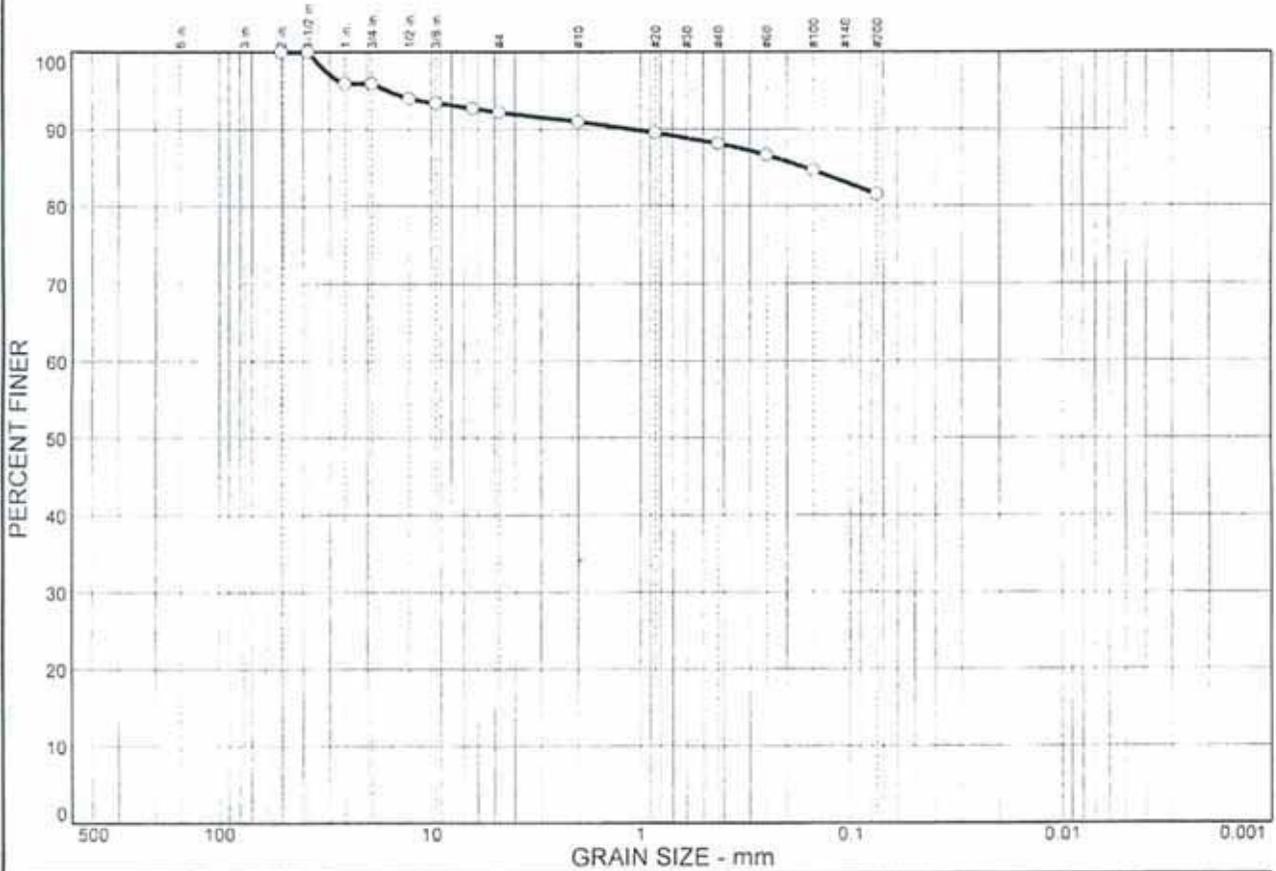
Respectfully submitted:
SJB Services, Inc.

Hamburg, New York
800-821-5911

Cortland, New York
800-296-6740

Albany, New York
888-248-8903

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	7.8	10.7	81.5	0.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2 in.	100.0		
1.5 in.	100.0		
1 in.	95.9		
3/4 in.	95.9		
1/2 in.	94.0		
3/8 in.	93.4		
1/4 in.	92.7		
#4	92.2		
#10	91.0		
#20	89.5		
#40	88.1		
#60	86.6		
#100	84.6		
#200	81.5		

Soil Description

Fines, Trace Sand, Trace Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 0.165 D₆₀= D₅₀=

D₃₀= D₁₅= D₁₀=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

* (no specification provided)

Sample No.: 14-046
Location: B-34

Source of Sample: B-34

Date: 02-03-2014
Elev./Depth: 2' - 10'

SJB SERVICES, INC.

Client: Mensch Capital Partners
Project: Westwood Country Club development Project

Project No: BE-13-192

Plate 14-046



Rochester Office
 535 Summit Point Drive
 Henrietta, NY 14467

LABORATORY D.I.P.R.A. TESTS

Project: Westwood Country Club

Project Number: BE-13-192

Town /City: N/A

Date: 02-03-2014

Client: Mensch Capital Partners

Technician: William Gilmore

Summary of Laboratory Analysis Soil

Lab ID:	Location:	Resistivity (Ohm-cm)		Redox (mv)		PH		Sulfides (+, T, -)		% Moisture Content (wet, moist, dry)		TOTAL POINTS
		Points	Points	Points	Points	Points	Points	Points	Points			
14-038	B-6 Composite Depth = 2' - 8'	15,000	-35.2	6.95	-	Moist (9.5%)		6				
		0	5	0	0	1						
14-046	B-34 Composite Depth = 2' - 10'	11,500	-22.6	6.35	-	Moist (8.9%)		6				
		0	5	0	0	1						

Per the Ductile Iron Pipe Research Association (DIPRA), point totals 10 or greater should be considered for Cathodic Protection.



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535 Summit Point Drive
Henrietta, NY 14467
Phone: 585-359-2730
Fax: 585-359-9668

Summary of Laboratory Testing

Project: Westwood Country Club Development Project Date: 02-03-2014
Client: Mensch Capital Project
Project Number: BE-13-192

Lab#	Location	Depth (Feet)	Chlorides (ppm)	Sulfates (ppm)
14-038	B-6 Composite	2 - 8	15	ND
14-046	B-34 Composite	2 - 10	10	ND

SJB Laboratory Technician: William Gilmore

Respectfully submitted:
SJB Services, Inc.

Chuck Guzzetta
District Manager

Hamburg, New York
800-821-5911

Cortland, New York
800-298-6740

Albany, New York
888-248-8903



**Contract
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and
Testing**

Rochester Office
535 Summit Point Drive
Henrietta, NY 14467
Phone: 585-359-2730
Fax: 585-359-9668

Summary of Laboratory Testing

Project: Proposed Westwood Country Club Development Project **Date:** 02-24-2014
Client: Mensch Capital Partners, LLC
Project Number:

Lab Id#	Location	Depth (ft)	Moisture Content (%)
14-121	B-45	2 – 4	23.1
14-122	B-45	4 – 6	23.4
14-123	B-45	6 – 8	28.6
14-124	B-45	8 – 10	20.2
14-125	B-45	2 – 10	23.9

SJB Laboratory Technician: William Gilmore

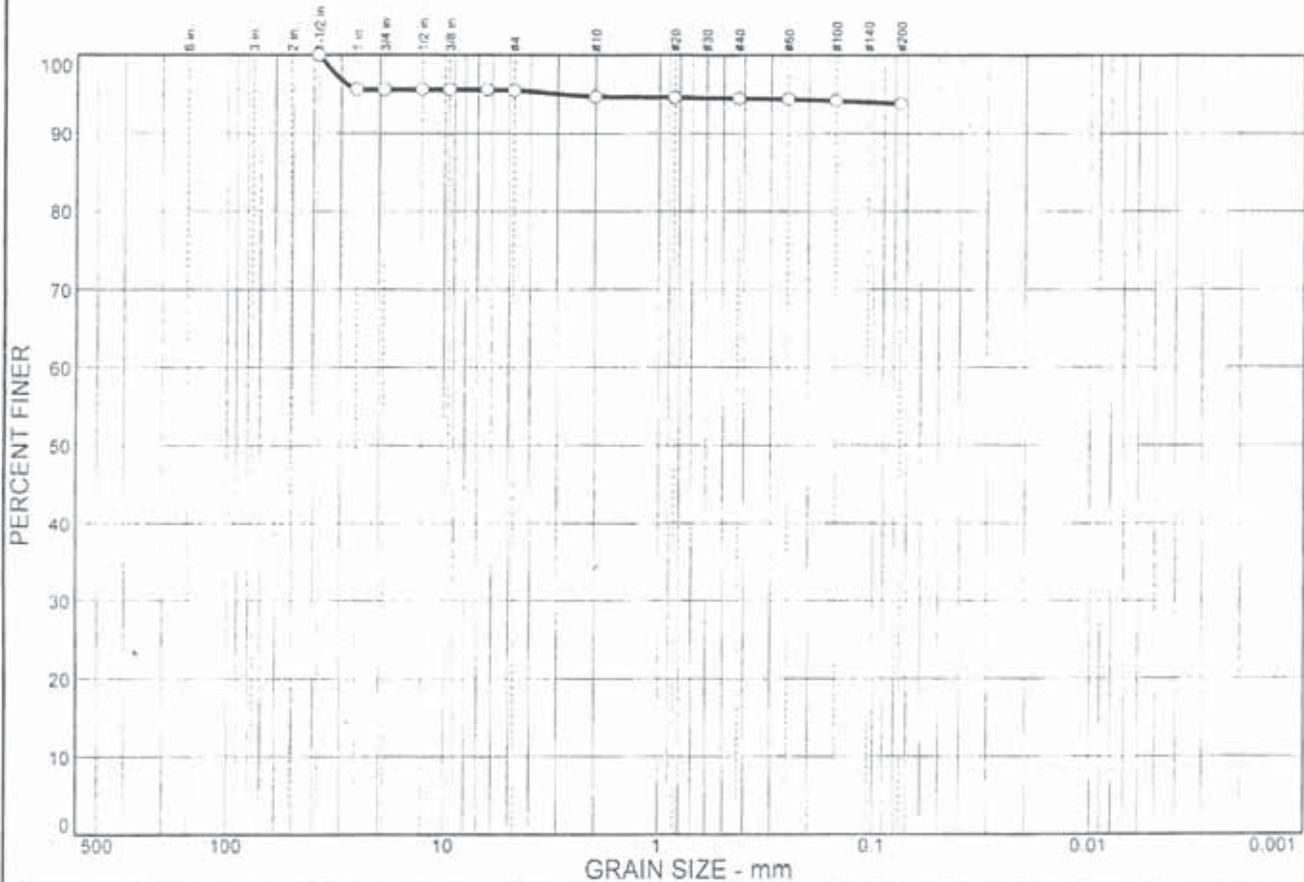
Respectfully submitted:
SJB Services, Inc.

Hamburg, New York
800-821-5911

Cortland, New York
800-296-6740

Albany, New York
888-248-8903

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.5	1.7	93.8	93.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5 in.	100.0		
1 in.	95.6		
3/4 in.	95.6		
1/2 in.	95.6		
3/8 in.	95.6		
1/4 in.	95.6		
#4	95.5		
#10	94.7		
#20	94.6		
#40	94.5		
#60	94.4		
#100	94.2		
#200	93.8		

Soil Description

Fines, Trace Gravel, Trace Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= D₆₀= D₅₀=

D₃₀= D₁₅= D₁₀=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

* (no specification provided)

Sample No.: 14-125 Source of Sample: B-45 Composite Date: 02-24-2014
 Location: B-45 Composite Elev./Depth: 2' - 10'

<h2 style="margin: 0;">SJB SERVICES, INC.</h2>	Client: Mensch Capital Partners Project: Westwood Country Club development Project Project No: BE-13-192 Plate 14-125
--	--



Rochester Office
 535 Summit Point Drive
 Henrietta, NY 14467

LABORATORY D.I.P.R.A. TESTS

Project: Westwood Country Club
 Project Number: BE-13-192
 Town /City: N/A
 Date: 02-24-2014

Client: Mensch Capital Partners
 Technician: William Gilmore

Summary of Laboratory Analysis Soil

Lab ID:	Location:	Resistivity	Redox	PH	Sulfides	% Moisture Content	TOTAL POINTS
		(Ohm-cm) Points	(mv) Points	Points	(+, T, -) Points	(wet, moist, dry) Points	
14-125	B-45 Composite Depth = 2' - 10'	2,700	9.0	7.55	-	Wet (23.9%)	7
		1	4	0	0	2	

Per the Ductile Iron Pipe Research Association (DIPRA), point totals 10 or greater should be considered for Cathodic Protection.



**Contract
Drilling
and
Testing**

Rochester Office
535 Summit Point Drive
Henrietta, NY 14467
Phone: 585-359-2730
Fax: 585-359-9668

Summary of Laboratory Testing

Project: Westwood Country Club Development Project **Date:** 02-24-2014
Client: Mensch Capital Project
Project Number: BE-13-192

Lab#	Location	Depth (Feet)	Chlorides (ppm)	Sulfates (ppm)
14-125	B-6 Composite	2 -10	18	ND

SJB Laboratory Technician: William Gilmore

Respectfully submitted:
SJB Services, Inc.

Chuck Guzzetta
District Manager

Hamburg, New York
800-821-5911

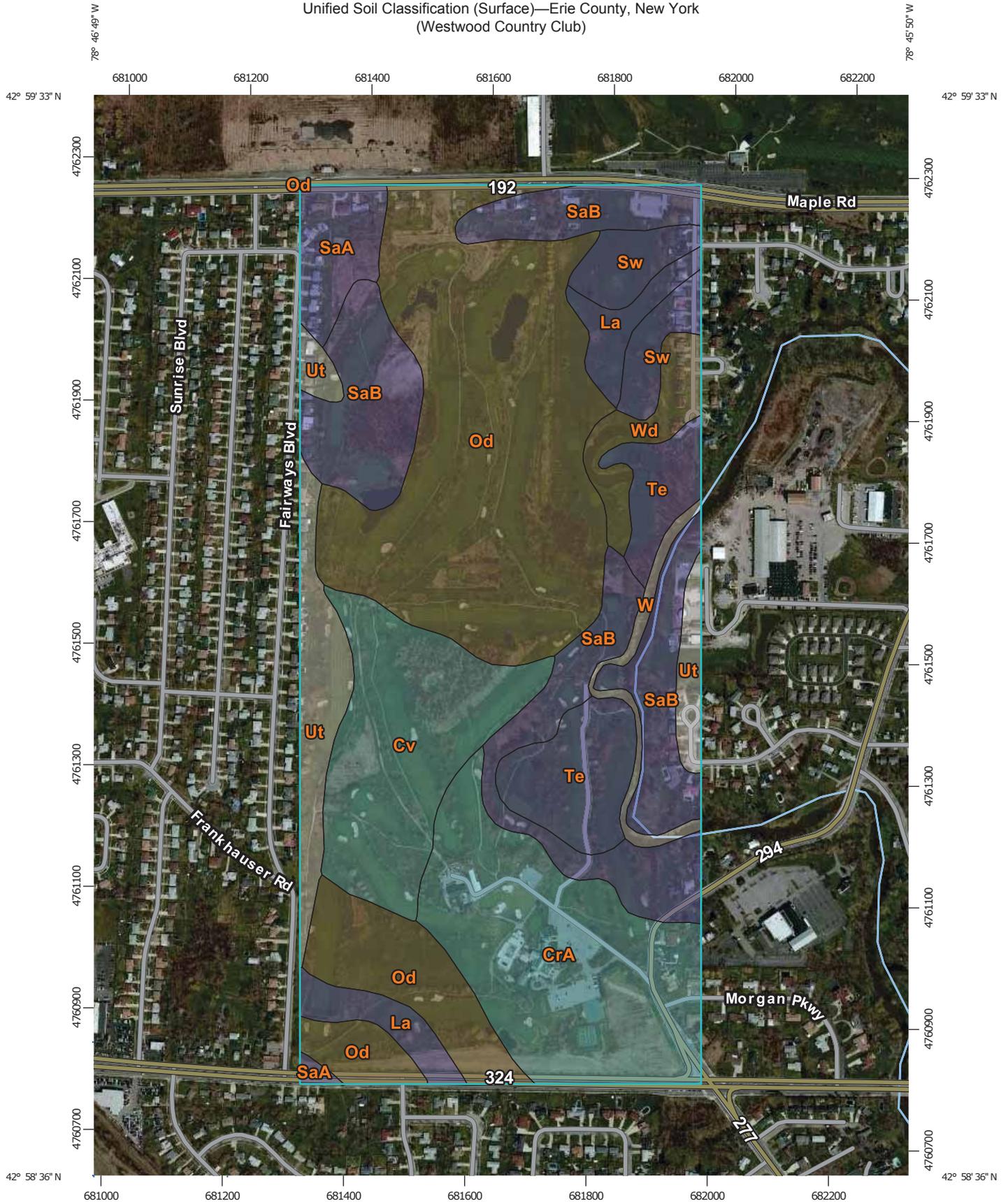
Cortland, New York
800-296-6740

Albany, New York
888-248-8903

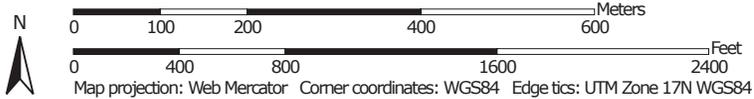
APPENDIX C
EXISTING SITE INFORMATION

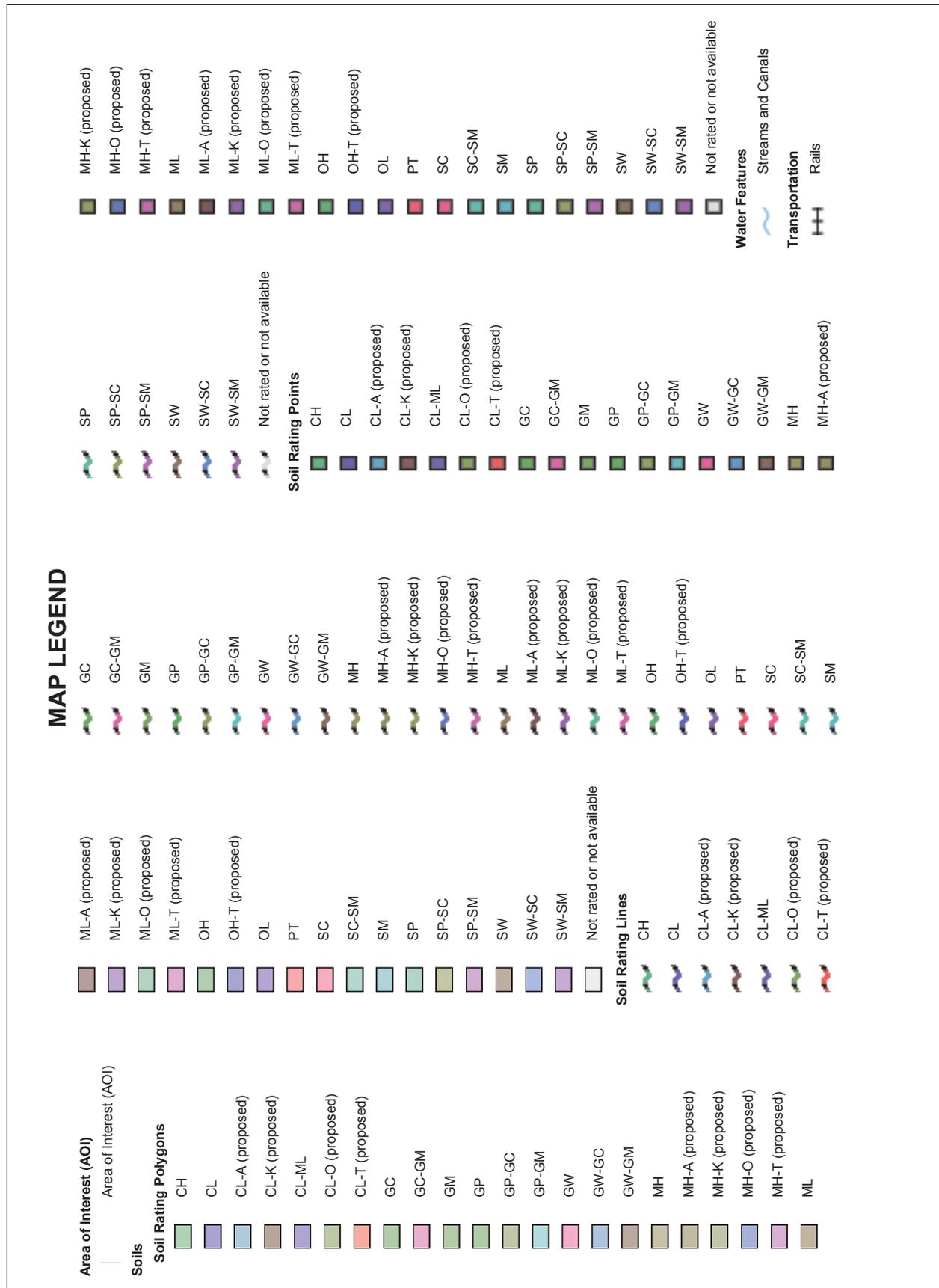
APPENDIX C1
SOIL SURVEY INFORMATION

Unified Soil Classification (Surface)—Erie County, New York
(Westwood Country Club)

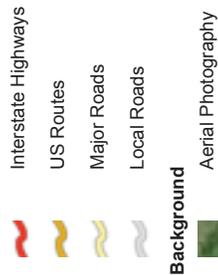


Map Scale: 1:8,660 if printed on A portrait (8.5" x 11") sheet.





MAP INFORMATION



The soil surveys that comprise your AOI were mapped at 1:15,800. Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
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: Erie County, New York
Survey Area Data: Version 11, Dec 1, 2011

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

Date(s) aerial images were photographed: Jun 2, 2010—Jul 1, 2011

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.

Unified Soil Classification (Surface)

Unified Soil Classification (Surface)— Summary by Map Unit — Erie County, New York (NY029)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrA	Claverack loamy fine sand, 0 to 3 percent slopes	SM	36.1	14.9%
Cv	Cosad loamy fine sand	SM	25.9	10.7%
La	Lakemont silt loam	CL	8.2	3.4%
Od	Odessa silt loam	ML	77.6	32.0%
SaA	Schoharie silt loam, 0 to 3 percent slopes	CL	7.4	3.1%
SaB	Schoharie silt loam, 3 to 8 percent slopes	CL	41.8	17.2%
Sw	Swormville clay loam	CL	8.2	3.4%
Te	Teel silt loam	CL	15.4	6.3%
Ut	Urban land-Odessa complex		13.4	5.5%
W	Water		2.9	1.2%
Wd	Wayland silt loam	ML	5.9	2.4%
Totals for Area of Interest			242.8	100.0%

Description

The Unified soil classification system classifies mineral and organic mineral soils for engineering purposes on the basis of particle-size characteristics, liquid limit, and plasticity index. It identifies three major soil divisions: (i) coarse-grained soils having less than 50 percent, by weight, particles smaller than 0.074 mm in diameter; (ii) fine-grained soils having 50 percent or more, by weight, particles smaller than 0.074 mm in diameter; and (iii) highly organic soils that demonstrate certain organic characteristics. These divisions are further subdivided into a total of 15 basic soil groups. The major soil divisions and basic soil groups are determined on the basis of estimated or measured values for grain-size distribution and Atterberg limits. ASTM D 2487 shows the criteria chart used for classifying soil in the Unified system and the 15 basic soil groups of the system and the plasticity chart for the Unified system.

The various groupings of this classification correlate in a general way with the engineering behavior of soils. This correlation provides a useful first step in any field or laboratory investigation for engineering purposes. It can serve to make some general interpretations relating to probable performance of the soil for engineering uses.

For each soil horizon in the database one or more Unified soil classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Rating Options

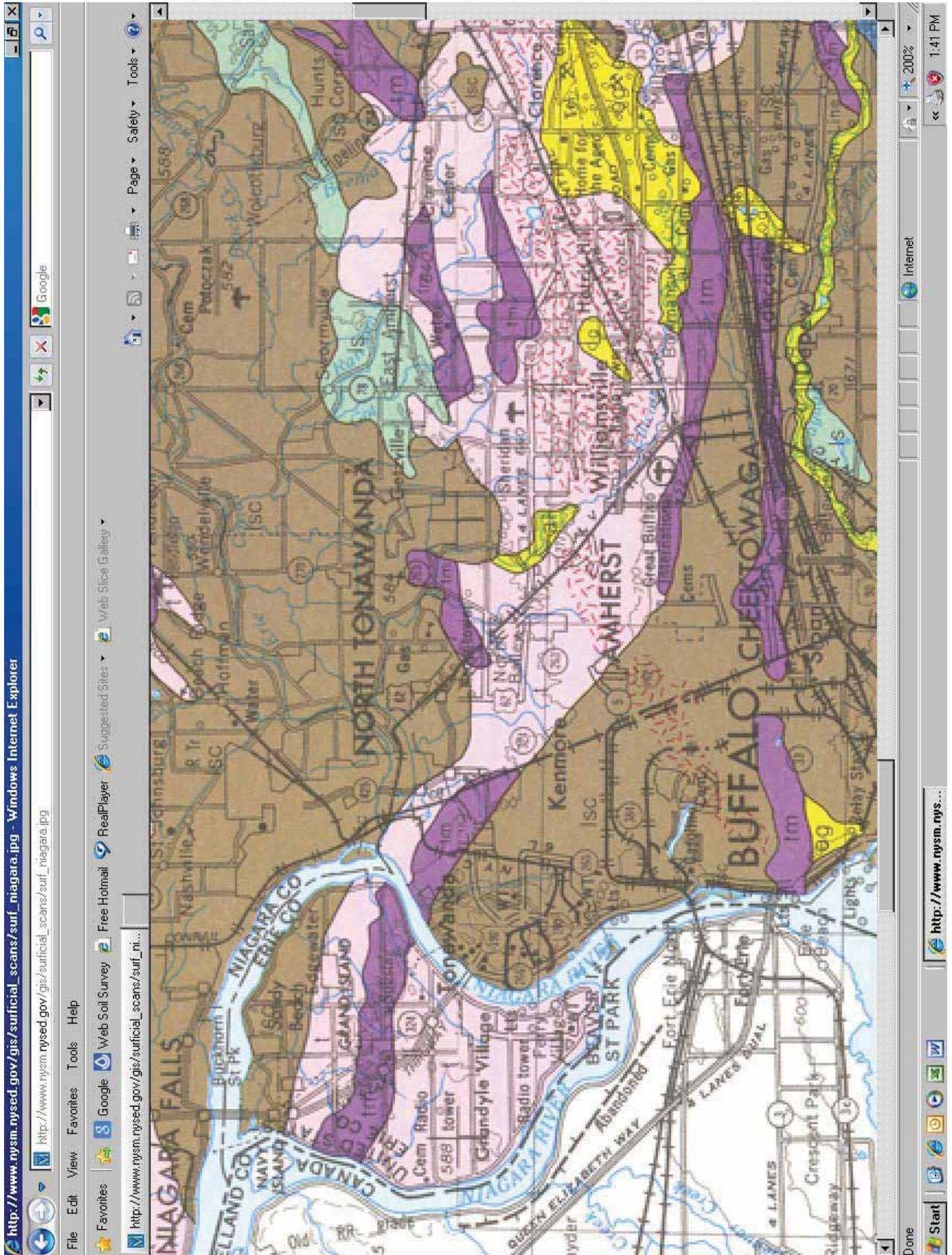
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

APPENDIX C2
SURFICIAL AND BEDROCK GEOLOGY



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Web Soil Survey Free Hotmail RealPlayer Suggested Sites Web Slice Gallery

http://www.nysm.nysed.gov/gis/surficial_scans/surf_ni...

generally more permeable than till, deposition adjacent to ice, more variably drained, may include ablation till, thickness variable (10-30 meters).

t — Till
Variable texture (e.g. clay, silt-clay, boulder clay), usually poorly sorted diamict, deposition beneath glacier ice, relatively impermeable (loamy matrix), variable clast content — ranging from abundant well-rounded diverse lithologies in valley tills to relatively angular, more limited lithologies in upland tills, tends to be sandy in areas underlain by gneiss or sandstone, potential land instability on steep slopes, thickness variable (1-50 meters).

r — Bedrock
Exposed or generally within 1 meter of the surface.

Bedrock stipple overprint
Bedrock may be within 1-3 meters of the surface, may sporadically crop out, variable mantle of rock debris and glacial till.

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http://www.nysm.nysed.gov/gis/surficial_scans/surf_ni...

thickness variable (up to 100 meters);
stipple overprint where bedrock is within 1-3 meters of the surface.

ls — Lacustrine sand
Sand deposits associated with large bodies of water, generally a near-shore deposit or near a sand source, well sorted, stratified, generally quartz sand, thickness variable (2-20 meters).

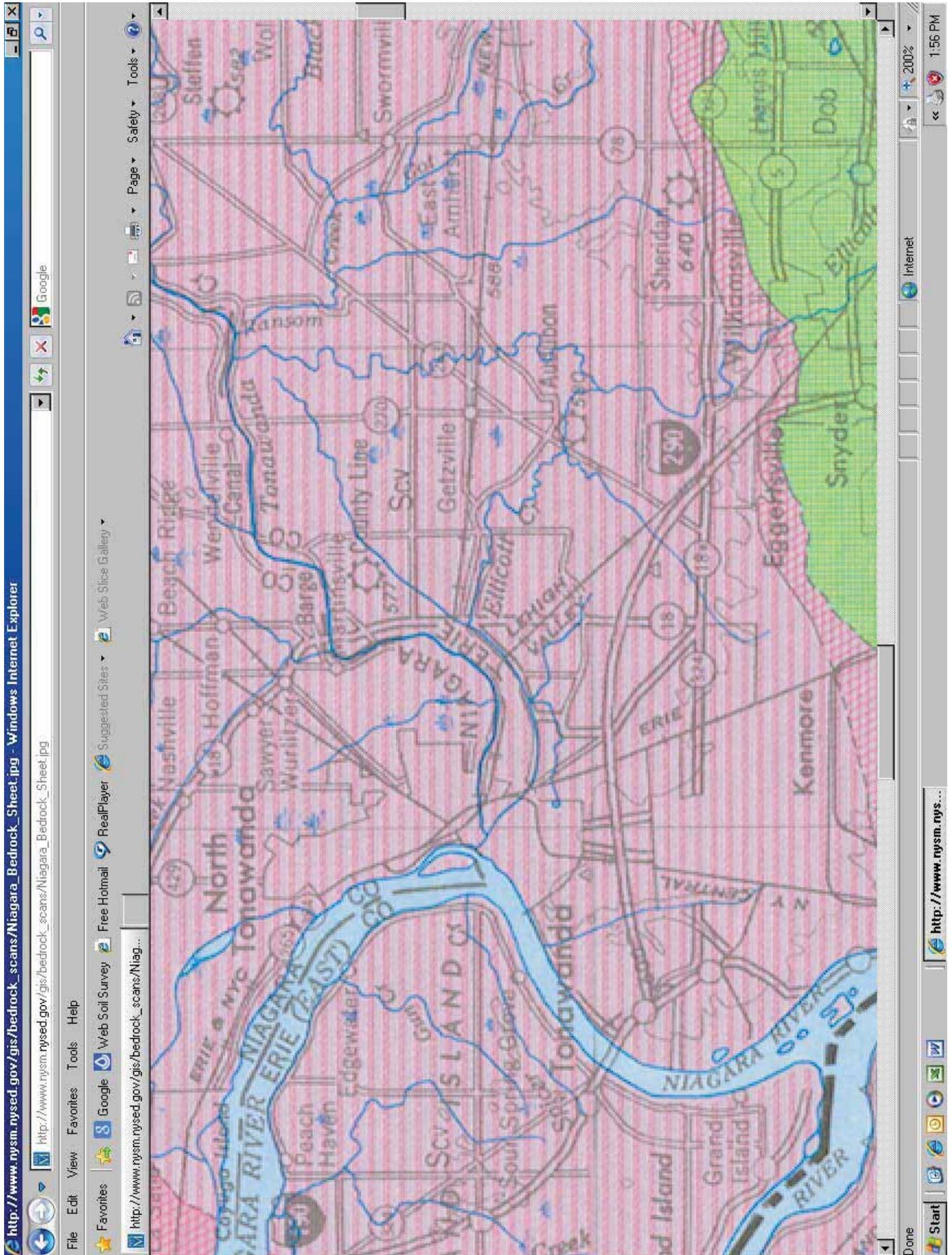
og — Outwash sand and gravel
Coarse to fine gravel with sand, proglacial fluvial deposition, well rounded and stratified, generally finer texture away from ice border, may be calcareted beyond Wisconsinan glacial limit, thickness variable (2-20 meters).

fg — Fluvial gravel
Same as outwash sand and gravel, except deposition farther from glacier, age uncertain.

k — Kame deposits
Includes kames, eskers, kame terraces, kame deltas, coarse to fine gravel and/or sand, deposition adjacent to ice (if at ice margin, relief is below elevation of associated o

Done

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http://www.nysm.nysed.gov/gis/bedrock_scans/Niagara_Bedrock_Sheet.jpg

File Edit View Favorites Tools Help

RealPlayer Suggested Sites Web Soil Survey Free Hotmail

http://www.nysm.nysed.gov/gis/bedrock_scans/Niag...

Lower	Do	Bois Blanc Formation—dolostone, limestone, sandstone (Springvale). Oriskany Sandstone.
Upper Silurian	Sab Scv	AKRON DOLOSTONE AND SALINA GROUP 400-700 ft. (120-210 m.) Akron Dolostone; Bertie Formation—dolostone, shale. Camillus, Syracuse, and Vernon Formations—shale, dolostone, salt, and gypsum.
	SI	LOCKPORT GROUP 150-200 ft. (45-60 m.) Guelph, Oak Orchard, Eramosa, and Goat Island Dolostones; Gasport Limestone—local bioherms.
urian	Sc1	CLINTON GROUP 100-150 ft. (30-45 m.) Decew Dolostone; Rochester Shale; Irondequoit and Merriton Limestones. Decew Dolostone; Rochester Shale. Irondequoit Limestone; Rockway Dolostone; Hickory Corners Limestone; Neahga Shale; Kodak Sandstone.
	Sr	
	Sik	

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APPENDIX C3
FLOOD PLAIN MAPPING



Erie County On-Line Mapping System



Legend

Base Flood Elevation

Flood Hazard Lines

- <all other values>
- 0.2 PCT ANNUAL CHANCE FLOOD
- 0.2 PCT ANNUAL CHANCE FLOOD
- 1 PCT ANNUAL CHANCE FLOOD
- 1 PCT ANNUAL CHANCE FLOOD
- APPARENT LIMIT
- AREA NOT INCLUDED
- END OF SPATIAL EXTENT
- FLOODWAY
- FLOODWAY
- ZONE BREAK/ FLOODWAY
- FLOWAGE EASEMENT BOUNDARY
- LIMIT OF DETAILED STUDY
- LIMIT OF DETAILED STUDY/ ZONE
- LIMIT OF FLOODWAY
- LIMIT OF FLOODWAY/ ZONE BREAK
- LIMIT OF STUDY
- SOURCE BOUNDARY
- STATE ENCROACHMENT LINE
- ZONE BREAK
- ZONE D
- Not Printed / ZONE D

Cross Section Lines

Streets and Highways

- Interstate
- Primary State Road
- Secondary State Road
- County Road
- Local Road

Parcels

1: 10,476



Notes

Enter Map Description

0.3 0 0.17 0.3 Miles

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ERIE COUNTY, NEW YORK
DEPARTMENT OF ENVIRONMENT & PLANNING
OFFICE OF GEOGRAPHIC INFORMATION SERVICES

APPENDIX D

GEOTECHNICAL REPORT LIMITATIONS

GEOTECHNICAL REPORT LIMITATIONS

Empire Geo-Services, Inc. (Empire) has endeavored to meet the generally accepted standard of care for the services completed, and in doing so is obliged to advise the geotechnical report user of our report limitations. Empire believes that providing information about the report preparation and limitations is essential to help the user reduce geotechnical-related delays, cost over-runs, and other problems that can develop during the design and construction process. Empire would be pleased to answer any questions regarding the following limitations and use of our report to assist the user in assessing risks and planning for site development and construction.

PROJECT SPECIFIC FACTORS: The conclusions and recommendations provided in our geotechnical report were prepared based on project specific factors described in the report, such as size, loading, and intended use of structures; general configuration of structures, roadways, and parking lots; existing and proposed site grading; and any other pertinent project information. Changes to the project details may alter the factors considered in development of the report conclusions and recommendations. *Accordingly, Empire cannot accept responsibility for problems which may develop if we are not consulted regarding any changes to the project specific factors that were assumed during the report preparation.*

SUBSURFACE CONDITIONS: The site exploration investigated subsurface conditions only at discrete test locations. Empire has used judgement to infer subsurface conditions between the discrete test locations, and on this basis the conclusions and recommendations in our geotechnical report were developed. It should be understood that the overall subsurface conditions inferred by Empire may vary from those revealed during construction, and these variations may impact on the assumptions made in developing the report conclusions and recommendations. *For this reason, Empire should be retained during construction to confirm that conditions are as expected, and to refine our conclusions and recommendations in the event that conditions are encountered that were not disclosed during the site exploration program.*

USE OF GEOTECHNICAL REPORT: Unless indicated otherwise, our geotechnical report has been prepared for the use of our client for specific application to the site and project conditions described in the report. *Without consulting with Empire, our geotechnical report should not be applied by any party to other sites or for any uses other than those originally intended.*

CHANGES IN SITE CONDITIONS: Surface and subsurface conditions are subject to change at a project site subsequent to preparation of the geotechnical report. Changes may include, but are not limited to, floods, earthquakes, groundwater fluctuations, and construction activities at the site and/or adjoining properties. *Empire should be informed of any such changes to determine if additional investigative and/or evaluation work is warranted.*

MISINTERPRETATION OF REPORT: The conclusions and recommendations contained in our geotechnical report are subject to misinterpretation. *To limit this possibility, Empire should review project plans and specifications relative to geotechnical issues to confirm that the recommendations contained in our report have been properly interpreted and applied.*

Subsurface exploration logs and other report data are also subject to misinterpretation by others if they are separated from the geotechnical report. This often occurs when copies of logs are given to contractors during the bid preparation process. *To minimize the potential for misinterpretation, the subsurface logs should not be separated from our geotechnical report and the use of excerpted or incomplete portions of the report should be avoided.*

OTHER LIMITATIONS: Geotechnical engineering is less exact than other design disciplines, as it is based partly on judgement and opinion. For this reason, our geotechnical report may include clauses that identify the limits of Empire's responsibility, or that may describe other limitations specific to a project. These clauses are intended to help all parties recognize their responsibilities and to assist them in assessing risks and decision making. Empire would be pleased to discuss these clauses and to answer any questions that may arise.



LOCATION			SJB-MW-3-102716	U1-70-112116		
SAMPLING DATE			10/27/2016		11/21/2016	
LAB SAMPLE ID			L1634732-01		L1637886-01	
	NY-TOGS-GA	Units	Results	Qual	Results	Qual
Dissolved Metals						
Aluminum, Dissolved	2000	ug/l	7	J	-	-
Antimony, Dissolved	6	ug/l	0.8	J	-	-
Arsenic, Dissolved	50	ug/l	3.3		-	-
Barium, Dissolved	2000	ug/l	47.5		-	-
Beryllium, Dissolved	3	ug/l	0.5	U	-	-
Cadmium, Dissolved	10	ug/l	0.2	U	-	-
Calcium, Dissolved		ug/l	315000		-	-
Chromium, Dissolved	100	ug/l	1.5		-	-
Cobalt, Dissolved		ug/l	0.6		-	-
Copper, Dissolved	1000	ug/l	1.7		-	-
Iron, Dissolved	600	ug/l	26	J	-	-
Lead, Dissolved	50	ug/l	1	U	-	-
Magnesium, Dissolved	35000	ug/l	227000		-	-
Manganese, Dissolved	600	ug/l	101.8		-	-
Mercury, Dissolved	1.4	ug/l	0.2	U	-	-
Nickel, Dissolved	200	ug/l	3		-	-
Potassium, Dissolved		ug/l	7310		-	-
Selenium, Dissolved	20	ug/l	5	U	-	-
Silver, Dissolved	100	ug/l	0.4	U	-	-
Sodium, Dissolved		ug/l	51000		-	-
Thallium, Dissolved	0.5	ug/l	0.5	U	-	-
Vanadium, Dissolved		ug/l	5	U	-	-
Zinc, Dissolved	5000	ug/l	10	U	-	-
Total Metals						
Aluminum, Total	2000	ug/l	1830		398	
Antimony, Total	6	ug/l	4	U	4	U
Arsenic, Total	50	ug/l	7.2		3.8	
Barium, Total	2000	ug/l	67.8		13.1	
Beryllium, Total	3	ug/l	0.5	U	0.5	U
Cadmium, Total	10	ug/l	0.2	U	0.2	U
Calcium, Total		ug/l	309000		125000	
Chromium, Total	100	ug/l	3.3		1.1	
Cobalt, Total		ug/l	2		1	
Copper, Total	1000	ug/l	4.7		1	
Iron, Total	600	ug/l	3260		858	
Lead, Total	50	ug/l	3		0.6	J
Magnesium, Total	35000	ug/l	222000		114000	
Manganese, Total	600	ug/l	204.4		173.4	
Mercury, Total	1.4	ug/l	0.2	U	0.2	U
Nickel, Total	200	ug/l	5.4		2.4	
Potassium, Total		ug/l	7140		2810	
Selenium, Total	20	ug/l	5	U	5	U
Silver, Total	100	ug/l	0.4	U	0.4	U
Sodium, Total		ug/l	52800		56700	
Thallium, Total	0.5	ug/l	0.5	U	0.5	U
Vanadium, Total		ug/l	3.8	J	5	U
Zinc, Total	5000	ug/l	12.8		4.5	J

*NY-TOGS-GA: New York TOGS 111 Groundwater Effluent Limitations criteria reflects all addendum to criteria through June 2004.

Appendix B

Community Air Monitoring Plan

Community Air Monitoring Plan
for
Amherst Central Park South
772 North Forest Road
Town of Amherst, Erie County, New York
“P Order” (Index No. R9-20240227-28)

Site No. 915291

June 2024

Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil / waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate

surrogate, such as isobutylene. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m³) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m³ above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m³ above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust

suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

- (a) Objects to be measured: Dust, mists or aerosols;
- (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
- (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
- (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
- (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
- (f) Particle Size Range of Maximum Response: 0.1-10;
- (g) Total Number of Data Points in Memory: 10,000;
- (h) Logged Data: Each data point with average concentration, time/date and data point number;
- (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
- (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;

- (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
- (l) Operating Temperature: -10 to 50°C (14 to 122°F); and
- (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record-keeping plan.

5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative, this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m³, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m³ above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m³ continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM-10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

- (a) Applying water on haul roads;
- (b) Wetting equipment and excavation faces;
- (c) Spraying water on buckets during excavation and dumping;
- (d) Hauling materials in properly tarped or watertight containers;
- (e) Restricting vehicle speeds to 10 mph;
- (f) Covering excavated areas and material after excavation activity ceases; and
- (g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m³ action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.

Special Requirements:

In addition or in combination with the above, the following special requirements apply for work within 20 feet of potentially exposed individuals or structures:

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates will reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices will be considered to prevent exposures related to the work activities and to control dust and odors. Consideration will be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring will occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m³, work activities will be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m³ or less at the monitoring point.

- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements are as stated above under “Special Requirements for Work within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, shall be understood and the monitoring locations established accordingly. In these situations, exhaust fans or other engineering controls will be used to create negative air pressure within the work area during remedial activities. Additionally, the planned work will be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.