ENGINERING REPORT

APPLICATION FOR SPECIAL PERMIT FOR EARTH REMOVAL

PER SECTION 6.3.2 ANDOVER ZONING BYLAW

APPLICANT

CSH ANDOVER
978 F STREET
WASHINGTON, DC 20004

OWNER

LISA HOLIHAN MAYE & ROBERT J. MAYE
139 ELM STREET
ANDOVER, MA 01810

Prepared by:

Marchionda & Associates, L.P.
62 Montvale Avenue
Stoneham, MA 02180

COMMONWEALTH OF MASSACHUSETTS
PAUL A. MARCHIONDA
CIVIL
No. 30015
REGISTERED PROFESSIONAL ENGINEER

5-5-15

TABLE OF CONTENTS

- APPLICATION FOR SPECIAL PERMIT FOR EARTH MOVEMENT
- ENGINEERING REPORT
    - Geotechnical Report
    - Test Pit Logs

ATTACHMENTS

- Deeds
- List of Abutters
- Site, Special Permit and Subdivision Plans

EARTH MOVEMENT PERMIT APPLICATION

ANDOVER PLANNING BOARD

APPLICATION FOR SPECIAL PERMIT
FOR EARTH MOVEMENT
(Section 6.3. of the Andover Zoning Bylaw)

APPLICATION MUST BE COMPLETE
(Please print or type)

This application, completed and signed, shall be submitted with 18 copies of the application and narrative, 12 copies of the plans, 1 CD with PDFs of the plans and 7 copies of any drainage report.

Application is hereby made for a Special Permit for removal and/or regrading of Earth Materials pursuant to Section 6.3 of the Zoning By-Law and Section 3.0 of the Rules Governing Special Permits of the Andover Planning Board.

1. Applicant(s): CSH Andover, LLC

   Contact Name: Joseph F. McElwee Email: joe.mcelwee@cshjv.com

   Mailing Address: c/o Capitol Seniors Housing, 975 F Street NW, 9th Floor, Washington, D.C. 20004

   Telephone Number: (610) 246-6663

2. Record Owner(s): Robert J. Maye and Lisa Holihan Maye

   Mailing Address: 139 Elm Street, Andover, Massachusetts 01810

3. Interest in Property: _____ Owner XX Other

   (Describe): Prospective Purchaser (See Owner Authorization) attached hereto

4. Engineer: Marchionda & Associates, LP

   Contact Name: Paul Marchionda, P.E. & John Barrows, P.E.

   Mailing Address: 62 Montvale Avenue, Suite 8, Stoneham, Massachusetts 02180

   Telephone Number: (781) 438-6121

   Name of Professional Surveyor: David L. Farrar PLS # 50879

5. Name of Subdivision: CSH of Andover

6. Square footage of roadway construction land disturbance: 9,800

7. Square footage of total land disturbance: 190,700 total; 9800 rd, 5200 lot 1; 175,700 lot 2
   (Attach a breakdown of land disturbance for roadway construction including drainage system and each individual lot.)

8. Property Address: 139-143 Elm Street & 26 Pine Street

Assessors Map 21 Lot(s) 139 & 144

Zoning District(s) Including Overlay Districts: SRB and SRA

9. Site Information: The application shall include an engineering report and plan which provides information on all of the following in narrative and graphic detail:

a. Site soil types and boundaries based on U.S.D.A. S.C.S standards;
b. Areas of steep slopes, i.e. greater than 15%;
c. Predominant site vegetation, including existing cleared areas;
d. Locations of ledge/rock outcroppings;
e. Locations of standing water, wetlands, and perennial or intermittent streams;
f. Proposed locations of earth material stockpiles;
g. Maximum depth and width of proposed cuts;
h. Volume of earth materials to be removed from the site;
i. Type(s) of earth materials to be removed;
j. Destination(s) of material to be removed;
k. Estimated number of truckloads of materials;
l. Proposed schedule of removal operations;
m. Volume of earth materials to be regarded on the site;
n. Proposed soil and slope stabilization program;
o. Certified statement by the engineer that the data submitted to the Board is accurate;

See Earth Engineering Report, for responses to items 9a-9o.

The Applicant shall satisfactorily demonstrate to the Board that the subdivision plan associated with the request for removal and/or regarding makes the best feasible use of the existing topography of the site.

Signature of Record Owner

Lisa Holihan Maye
Print Name

April 28, 2015
Date

Signature of Record Owner

Robert J. Maye
Print Name

April 28, 2015
Date

CSH Andover, LLC

By: _____
Signature of Applicant

Joseph McElwee, duly authorized
Print Name

April 28, 2015
Date

(REVISED 6/13)

ENGINEERING REPORT

ENGINEERING REPORT

APPLICATION FOR SPECIAL PERMIT FOR EARTH MOVEMENT

139-143 ELM ST & 26 PINE STREET

NARRATIVE

CSH of Andover is proposing to subdivide 10.05 acres of land situated at 139-143 Elm Street and 26 Pine Street into two (2) lots. Lot 1 is proposed to be a 30,581 sf lot with legal frontage on the proposed subdivision road (Road A) on also on Elm Street. .Lot 2 is a 392,602 sf lot (9.0 acres) also with frontage on Elm Street and Road A.

The only earth movement proposed on lot 1 is very minimal grading associated with the proposed construction on lot 2. The earth movement on lot 2 is associated with the construction of a 96 unit assisted living residence, parking an associated infrastructure as shown on the attached plan set and as described herein.

The site design and proposed grades have been established to minimize the amount of excavation and earth movement required. The structure on lot 2 has been design to be a slab on grade which eliminates a significant amount of excavation that would have been required for a full foundation and the grades for building slab, access ways, parking areas and utilities have been set to minimize the necessary depths of excavation. In addition the excess material to be excavated will be utilized onsite for filling, grading and general landscaping as much as possible in order to reduce the amount of material to be trucked off site.

There are some areas of exposed weathered bedrock and bedrock was encountered in some of the soil borings and test pits The weathering of the bedrock encountered appears that most, if not all, of the bedrock to be removed can be accomplished by removing the material with an excavator or hoe-ram. If in the unlikely event that any blasting should be required, all blasting will be done in strict conformance with the State regulations for blasting (527 CMR 13.00), local requirements under the Board's subdivision regulations, and in accordance with all other applicable local and state regulations and under the direction of the Andover Fire Department. Blasting will not be undertaken on any weekend or holiday..

Section 6.3.2 of the Andover Zoning Bylaw (Earth Removal – "Regrading, Importing or Exporting of Earth Materials Incidental to Subdivision Development in Single Residence Districts") and Section 9 of the Application for Special Permit For Earth Movement includes specific requirements for information to be provided by the applicant labeled items 9a through 9o. Section 6.3.2.1 of the Zoning Bylaw adds that "a special permit from the Planning Board shall be required for any earth movement undertaken in connection with the construction of streets in a subdivision. Whenever and wherever possible, cuts and fills associated with the construction of such streets shall be balanced to minimize movement of materials on or off the right-of-way." In addition, Section 6.3.2.2 of the Zoning Bylaw adds that "a special permit from the Planning Board shall be required for earth movement associated with the preparation of lots in a subdivision. Under such a permit, regrading shall be in conformity with the slope

requirements set forth in Section 4.1.4.5 of this by-law. " Lastly, Section 6.3.2.3 of the Zoning Bylaw includes the information requirements to be filed with the Planning Board and which generally mirror the requirements set forth under Section 9.0 of the Application. Before granting any special permit under Section 6.3.2.1, 6.3.2.2, or 6.3.2.3, Section 6.3.2.3 states "the Planning Board must find that the subdivision plan as a whole makes the best feasible design of existing topography, and in making such finding the Board shall take into account the magnitude of the change in topography resulting from the subdivision plan, the extent of cuts and fills, the amounts of earth materials involved, the removal of existing vegetation, the preservation and protection of significant natural topographic features such as eskers, streams, mature vegetation and rock outcrops, and the type and size of the subdivision plan, whether it be conventional or cluster."

The following in bold is the specific requirement followed by the information being provided.

9a. Site soil types and boundaries based on USDA SCS Standards – USDA soil types and boundaries are shown on the existing conditions plan attached.

9b. Areas of Slopes i.e greater than 15%. Areas of slopes greater than 15% are shown on the existing conditions plan attached.

9c. Predominant site vegetation including cleared areas – The site predominately consists of open lawn and forested areas. See the existing conditions plan attached.

9d Locations of ledge/outcroppings – Locations of ledge/outcroppings and shown on the existing conditions plan attached.

9e. Locations of standing water, wetlands and perennial or intermittent streams – See existing conditions plan attached.

9f. Proposed location of earth stockpiles - Earth stockpiling will be limited to stockpiling of topsoil for reuse on site. Stockpile areas will be located greater than 100 feet from any wetland resource area and are shown on the Erosion Control Plan attached.

9g. Maximum depth and widths of proposed cuts The maximum depth and width is 7.5 feet deep by 15 feet wide.

9h. Volume of earth materials to be removed from the site. 6,700 cy
9i. Type(s) of earth material to be removed – Material to be removed from the site will consists primarily of silty sands and silty sands with gravel. Copies of the site geotechnical report and test pts conducted by Marchionda & Associates are included with this report.

9j. Destination(s) of material removed - Destination(s) of the excess material to be removed have not been determined at this time. That determination will be made by the site contractor that is selected for the project. Typically to minimize trucking costs destinations in close proximity to the site that are in need of fill are identified by the site contractor.

9k. Estimate number of truckloads of material – Approximately 250 truckloads will be required to remove the excess material from the site based upon a standard truckload of 25 cu yards.

9l. Proposed schedule of removal operations – The general and site contractor will prepare a schedule for the site construction which will include the schedule of removal operations. It is anticipated that all major earth removal operations will be completed within the first 30 to 60 days of construction.

9m. Volume of earth materials to be regarded on the site – 4,900 cy

9n. Proposed soil and slope stabilization program – All soil and slope stabilization will be completed in conformance with the standards required by the EPA NPDES (National Pollutant Discharge Elimination Program) required for all construction activities in excess of 1 acre and as detailed on the attached Erosion Control Plan and as to be specified in the Stormwater Pollution Prevent Plan (SWPPP) which is an integral component of the Notice of Intent to be filed with the EPA as required by the NPDES program. The SWPPP is a very comprehensive document consisting of plans and specifications to ensure that construction best management practices are implemented in order to protect the natural environment and to prevent potential impacts to air and water, as well as stormwater runoff and erosion impacts to the neighborhood and surrounding environment. The components of the SWPPP, which are set forth in federal regulation, include stabilized construction entrances to prevent tracking of debris onto the public roadways, street sweeping, dust control, stabilization of all disturbed surfaces, vehicle washing areas and erosion control standards.

9o. Certified statement by the engineer that the data submitted to the Board is accurate

See below.

Before granting any special permit under Section 6.3.2.1, 6.3.2.2, or 6.3.2.3, Section 6.3.2.3 states "the Planning Board must find that the subdivision plan as a whole makes the best feasible design of existing topography, and in making such finding the Board shall take into account the magnitude of the change in topography resulting from the subdivision plan, the extent of cuts and fills, the amounts of earth materials involved, the removal of existing vegetation, the preservation and protection of significant natural topographic features such as eskers, streams, mature vegetation and rock outcrops, and the type and size of the subdivision plan, whether it be conventional or cluster." Based upon the information contained within the plans, the accompanying Geotechnical Report, and other information to be discussed at the hearing, the site design and proposed grades for the subdivision and related improvements have been designed to minimize the amount of excavation and earth movement required. The proposed structure on lot 2 has been designed to be a slab on grade which eliminates a significant amount of excavation that would have otherwise been required for a full foundation and the grades for building slab, access ways, parking areas and utilities have been set to minimize the necessary depths of excavation. In addition, the excess material to be excavated will be reused onsite for filling, grading and general landscaping as much as possible in order to reduce the amount of material to be trucked off site. Moreover, by minimizing cuts and fills to the extent practicable, the removal of existing vegetation has been minimized, and the areas proposed to be preserved as open space will lead to the preservation and protection of significant natural topographic features such as eskers, streams, mature vegetation and rock outcrops to the extent reasonably practicable.

Lastly, Section 9.4.2 of the Andover Zoning Bylaw (Special Permits - Criteria) provides that "special permits may be granted when the SPGA has found that the proposed use will not be unreasonably detrimental to the established or future character of the neighborhood and town and that such is in harmony with the general purpose and intent of this by-law. In addition to any specific factors that may be set forth in this by-law, the determination shall include consideration of each of the following: 1. Social, economic, or community needs which are served by the proposal; 2. Traffic flow and safety, including parking and loading; 3. Adequacy of utilities and other public services; 4. Neighborhood character and social structures; and 5. Impacts on the natural environment, including, but not limited to, air and water pollution, noise, stormwater runoff, and aesthetics.

For the reasons described in the materials provided, and which will be discussed at the hearing, the proposed use including the assisted living facility and related earth movement operations will not be unreasonably detrimental to the established or future character of the neighborhood and town and that such is in harmony with the general purpose and intent of this by-law as the earth removal is a customary requirement in subdivisions and has been reduced to the maximum extent practicable, and the earth work associated with the project will be temporary in nature, and will employ best management practices to ensure that adequate controls are in place during construction to ensure that work involving earth movement will be conducted in a manner which complies with generally accepted and customary limitations and controls to ensure protection of the environment. In addition to any specific factors described above, the determination shall include consideration of each of the following: 1. social, economic, or community needs which are served by the proposal include the establishment of an assisted living facility use which has a demonstrated need, and the earth movement required under the Zoning Bylaws for this project is necessary to establish the proposed use; 2. traffic flow and safety, including parking and loading are adequate to serve the needs of the facility both temporary needs during construction and post-construction as on-site parking for construction vehicles will be established as a part of construction operations; 3. adequacy of utilities and other public services are available at Elm Street to serve the project needs which are limited in connection with earth movement operations; 4. neighborhood character and social structures will not be impacted by the proposal as earth removal activities are temporary in nature, and all applicable laws and regulations will be complied with during such construction operations; and 5. impacts on the natural environment, including, but not limited to, air and water pollution, noise, stormwater runoff, and aesthetics, will be minimized and will be temporary in nature, as best management practices will be employed for erosion and sedimentation controls to ensure that stormwater and potential pollutants are controlled, and post-construction excavations will be stabilized, and noise will be kept to a minimum to avoid disruption to the neighborhood and the Town.

9o. Certified statement by the engineer that the data submitted to the Board is accurate
I Paul A. Marchionda, PE hereby certify that the data submitted with this application for special permit for earth movement is accurate.

GEOTECHNICAL REPORT

GEOTECHNICAL ENGINEERING REPORT

ANDOVER SITE

Andover Township, Essex County, Massachusetts

August 2014

Prepared For:

CSH Andover, LLC
c/o Capitol Seniors Housing
975 F Street NW
Ninth Floor
Washington, DC 20004

Attn: Mr. Joe McElwee

Prepared By:

GEO-TECHNOLOGY ASSOCIATES, INC.
Geotechnical and Environmental Consultants
14 Worlds Fair Drive, Suite B
Somerset, New Jersey 08873

GTA Job No: 141270

August 25, 2014

CSH Andover, LLC
c/o Capitol Seniors Housing
975 F Street NW, Ninth Floor
Washington D.C. 20004

Attn: Mr. Joe McElwee

Re: Geotechnical Engineering Report
Andover Site
Andover Township, Essex County, Massachusetts

Dear Mr. McElwee:

In accordance with our agreement dated July 15, 2014, Geo-Technology Associates, Inc. (GTA) has performed a preliminary geotechnical exploration for the proposed senior living facility that is planned to be constructed by CSH Andover, LLC at a site located in Andover Township, Essex County, Massachusetts. The exploration consisted of drilling 8 test borings throughout the site, visually classifying the encountered soils, and performing limited laboratory testing. The results of the field and laboratory testing and GTA's preliminary recommendations regarding design and construction of the proposed facility are included in this report.

GTA appreciates the opportunity to have been of assistance to you on this project. Please contact our office at (732) 271-9301 if you have questions or require additional information.

Very truly yours,
GEO-TECHNOLOGY ASSOCIATES, INC.

Devon A. Geyer, EIT
Project Engineer

Dennis C. Loh, P.E.
Vice President

LMC/DAG/DCL:dg
Job No. 141270
Attachments

TABLE OF CONTENTS

SUBJECT **PAGE**

INTRODUCTION 1

SITE CONDITIONS 2

PROPOSED CONSTRUCTION 2

SITE GEOLOGY 3

SUBSURFACE EXPLORATION 3

LABORATORY TESTING 4

SUBSURFACE CONDITIONS 5

CONCLUSIONS AND RECOMMENDATIONS 5

- Earthwork 6
- Earthwork 6
- Subsurface Utilities 11
- Foundations 11
- Seismic Information 13
- Floor Design 13
- Pavements 14

ADDITIONAL SERVICES 15

LIMITATIONS 16

ASFE—Important Information About Your Geotechnical Engineering Report

APPENDICES

- Appendix A – Figures (3 pages)
  - Figure 1 – Site Location Map
  - Figure 2 – Boring Location Plan – Option A (11 x 17)
  - Figure 3 – Boring Location Plan – Option B (11 x 17)
- Appendix B – Exploration Logs (9 pages)
  - Notes for Exploration Logs
  - Logs of Borings (8 pages)
- Appendix C – Laboratory Data (5 pages)
  - Grain Size Distribution (4 pages)
  - Summary of Natural Moisture Contents (1 page)

GEOTECHNICAL ENGINEERING REPORT

ANDOVER SITE
ESSEX COUNTY, MASSACHUSETTS
AUGUST 2014

INTRODUCTION

This report presents the results of a geotechnical exploration performed by Geo-Technology Associates, Inc. (GTA) for a Senior Living facility that may be constructed by Capitol Seniors Housing (CSH) at a site located in the Town of Andover, Essex County, Massachusetts. The approximately 11.43-acre site is located at 139-143 Elm Street and 26 Pine Street, which are identified as tax parcels 21-0-139 and 21-0-144, respectively, and as Lots 92, 95A, 97A, and 98A on the Andover Township tax map. The approximate site location is shown on the Site Location Map, which is Figure 1 in Appendix A.

GTA was provided with two proposed site plans titled *Option A* and *Option B*, prepared by Moseley Architects, which were included in the *Preliminary Investment Package*, prepared by Capitol Seniors Housing and dated June, 2014. The investment package also included a plan titled *Existing Conditions Plan*, prepared by Marchionda & Associates, L.P., dated August 1, 2014. The *Existing Conditions Plan* shows the layout of a dwelling, two garages, and a driveway with access to Elm and Pine Streets, and the existing site topography. Plans *Option A* and *Option B* indicate the layout of the proposed building and paved areas on the site. Proposed grading, utility, and structural drawings were not available at the time this report was prepared.

We understand that CSH intends to purchase the site for the construction of a Senior Living facility. In conjunction with the proposed purchase, GTA was retained to perform a geotechnical exploration of the site. The scope of this study included a field exploration, laboratory testing, and geotechnical engineering analyses. The field exploration included 8 Standard Penetration Test (SPT) borings that extended to depths of approximately 3 inches to 9 feet below the existing ground surface. Limited laboratory testing was performed on soil samples obtained from the explorations to assist in characterizing the general subsurface conditions. The conclusions and recommendations

presented in this report were derived from engineering analyses of field and laboratory data, and preliminary information for the proposed facilities as detailed herein.

SITE CONDITIONS

The site is located at 139-143 Elm Street & 26 Pine Street, and is bordered to the north, east, and west by residences and to the south by wooded land. The remaining surrounding vicinity contains residential and commercial properties and the Merrimack College campus. At the time of our study, the house shown on the *Existing Conditions Plan* was occupied and contained a basement. The site was partially wooded and contained rock outcroppings in the northern portion of the property which was a grass lawn at the time of our field work. Topographic information shown on the *Existing Conditions Plan* indicates the existing surface grades generally slope upward from the north and south toward the existing house located near the center of the property, with ground surface elevations across the site range from about Elevation (EL) 200 feet to EL 234 feet.

PROPOSED CONSTRUCTION

Planning for the proposed senior living facility is in the conceptual stages. The *Option A* plan indicates the site will be developed by the construction of a 2½-story Senior Living Facility with a footprint area of about 87,720 square feet, while the *Option B* plan indicates the site will be developed by the construction of a 2-story facility with a footprint area of about 90,000 square feet. Both facilities would house 110 living units. The facility depicted on each plan will generally be sited in the northern portion of the site. Basement areas are not planned. The proposed site improvements will include at-grade automobile parking areas throughout the site. Access and egress will be from Elm Street. Stormwater management (SWM) basins and retaining walls are not indicated on either Plan.

Grading plans were not available at the time this report was prepared. Based on the existing topography, we anticipate that cuts and fills of up to about 4- to 6-feet from the existing surface grades will be required to achieve the proposed site grades and building floor slab levels.

The structures are assumed to be cast-in-place concrete and timber- or steel-frame construction. Based on our experience on projects of similar scope, we estimate that the proposed building will have maximum column and bearing wall loads of up to approximately 120 to 150 kips and 6 to 8 kips per linear foot, respectively. Maximum ground floor slab live loads of approximately 100 pounds per square foot are anticipated.

SITE GEOLOGY

According to the Water-quality Assessment of the New England Coastal Basins in Maine, Massachusetts, New Hampshire, and Rhode Island: Environmental Settings and Implications of Water Quality and Aquatic Biota, prepared by the USGS the site is situated within the Seaboard Lowland section of New England Physiographic Province. The upland hills areas of the Seaboard Lowland Section generally consist of drumlins and ground moraines composed of glacial till, while the valley areas consist of level to steep rolling landforms consisting of glacial fluvial, lacustrine, and swamp deposits. According to the Bedrock Geologic Map of Massachusetts (1983) published by the USGS, the site is underlain by Andover Granite of the Silurian or Ordovician Eras. The Andover Granite generally consists of light- to medium-gray foliated, medium- to coarse-grained muscovite biotite granite with common pegmatite masses.

SUBSURFACE EXPLORATION

The subsurface exploration program consisted of performing 8 SPT borings throughout the site. The borings were performed by GTA on July 24, 2014 and extended to depths ranging from approximately 3 inches to 9 feet below the ground surface. The exploration locations were selected by GTA. The approximate locations of the explorations performed for this study are shown on Boring Location Plan – Option A, and Boring Location Plan – Option B, which are included in Appendix A as Figures 2 and 3, respectively. Detailed descriptions of the encountered subsurface conditions are indicated on the Logs of Borings, which are included in Appendix B.

Standard Penetration Testing (SPT) was performed in the borings in accordance with procedures of ASTM D1586. Soil samples were obtained at two- to five-foot intervals within the boreholes. The SPT involves driving a 2-inch O.D., 1⅜-inch I.D. split-spoon sampler with a 140-

pound hammer free-falling from a height of 30-inches. The number of blows required to drive the sampler was recorded in six-inch intervals. The SPT N-value, given as blows per foot, is defined as the total number of blows required to drive the sampler from the 6- to 18-inch interval.

Soil samples obtained from the explorations were brought to GTA's laboratory for visual classification by a geotechnical engineer and limited laboratory testing. The descriptions provided on the logs are therefore based on visual observations of the samples as summarized in the Notes for Exploration Logs included in Appendix B, supplemented by the laboratory test results.

LABORATORY TESTING

Laboratory testing performed for this study included grain size distribution testing for classification of the soils in accordance with the Unified Soil Classification System (USCS), and natural moisture content determinations. Classification of soils in accordance with the USCS provides information regarding the engineering properties of the on-site soils that will likely support the proposed foundations, slabs, and pavements, and be used as controlled compacted fill and backfill. The results of the laboratory testing are summarized in the following table. Detailed results of the laboratory testing performed for this study are included in Appendix C.

SUMMARY OF LABORATORY TEST RESULTS

BORING NUMBER	DEPTH (ft)	NMC (%)	USCS CLASSIFICATION
B-1	0-2	19.9	Sandy SILT (ML)
B-2	4-6	10.8	Silty SAND with gravel (SM)
B-4	0-2	10.5	Silty SAND with gravel (SM)
B-7	6-8	9.1	Silty SAND with gravel (SM)

Note: NMC = Natural Moisture Content

The natural moisture contents of the soil samples tested ranged from 4.4 to 25.7 percent, averaging about 12 percent.

SUBSURFACE CONDITIONS

Surface Materials: A 2-inch to 2-foot thick layer of topsoil averaging was encountered at the ground surface in the explorations performed for this study.

Natural Soils: Natural soils were encountered below the topsoil and appear to confirm the published geology. The upper portions of the natural soils generally consisted of sandy silt with gravel or silty sand with gravel and extended to depths ranging from about 1 to 5½ feet below the ground surface. Borings B-3 and B-6 did not encounter silty sands or sandy silts. A stratum of poorly-graded gravel with sand was encountered below the topsoil in Boring B-3 and below the sandy silts/silty sands in Borings B-4 and B-5, and extending to depths ranging from approximately 3 to 4 feet below the ground surface.

Bedrock: Bedrock was encountered below the topsoil in Boring B-6, and rock outcrops were observed in that general area. Highly weathered rock was encountered below the natural soils in the remaining borings at depths ranging from about 1 to 8 feet below the ground surface, and refusal to further auger penetration was encountered on relatively sound rock at depths ranging from approximately 1½ to 9 feet below the ground surface.

Groundwater: Groundwater was not encountered in the explorations performed for this study. Long-term groundwater readings were not obtained because the explorations were backfilled upon completion for safety considerations. Fluctuations in the groundwater level typically occur due to several factors, including variations in precipitation, seasonal changes, and site development activities. It should be anticipated that seepage of perched or trapped water may occur in construction excavations at potentially shallow depths throughout the site, especially at the soil-rock interface.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this study, it is GTA's opinion that development of the site with a senior living facility is feasible, given that the geotechnical recommendations are followed, and that the standard level of care is maintained during construction. Following the recommended earthwork

procedures as outlined in this report, it is our opinion that the proposed structure may be supported by conventional spread footings, and the ground level floor slabs may be established on-grade. Geotechnical issues that may impact site development include the presence of fine-grained natural soils that are highly-sensitive to disturbance and softening, the likelihood that bedrock will be encountered at very shallow depths, the potential to encounter shallow water seepage, and buildings that will require demolition and backfilling. Further discussions of our preliminary geotechnical recommendations for site development are presented in the following sections of this report. GTA recommends that supplementary explorations be performed after the site plans are more fully developed.

Earthwork

Site preparation should begin by razing existing structures, removing the existing surface obstructions (fences, etc.), clearing the trees and stumps, and stripping the topsoil from within and at least five feet beyond proposed building and pavement areas. All subsurface walls, slabs, etc. of the existing buildings, and subsurface utilities that will be abandoned, should be completely removed from within and at least five feet beyond the limits of the proposed building area. The excavations to remove the existing building elements and utilities should be backfilled with controlled compacted fill if they extend below the proposed grades in structural areas. We recommend that the controlled compacted fill be placed by the earthwork contractor (rather than the demolition contractor) under the observation of the geotechnical engineer. Durable elements of existing structures may remain in place below proposed pavement or landscaped areas provided they are cut off at least two feet below the proposed subgrade levels and will not interfere with proposed utilities.

Earthwork

Trees and other surface vegetation should be removed and the topsoil stripped from within and at least five feet beyond the proposed building, pavement, and stormwater management areas. The actual stripping thickness will likely be somewhat greater than the thicknesses shown on the boring logs and will depend on localized topsoil development, root mat thickness, precipitation, soil moisture, construction traffic disturbance, and contractor care. Topsoil may be stockpiled on-site for future use in landscaped areas, but will not be suitable for use as fill in structural areas or as

retaining wall backfill. Topsoil from the existing wooded areas will likely contain leaves and wood, and some processing of the topsoil will be required to generate quality topsoil for reuse in proposed landscaped areas, reducing the volume of topsoil that will be available for reuse.

Following clearing, stripping, and structure demolition and backfilling, the exposed subgrade soils below the proposed building and pavement areas to remain at grade or receive fill should be evaluated by a geotechnical engineer or his qualified representative. Ideally, the evaluation should consist of proofrolling and compacting the soils to a dense and unyielding consistency by several passes of a large smooth drum vibratory compactor with a static drum weight of at least ten tons, although proofrolling using static methods may be deemed more appropriate by the geotechnical engineer depending on the prevailing weather conditions and type of soil exposed. Soils that are observed to be soft or unstable during the evaluation should be selectively excavated, and the resultant excavations should be backfilled with controlled compacted fill.

The natural sandy silts and silty sands contain relatively high percentages of fines (silt and clay), and undercutting of unstable soils should be expected. The extent of undercutting will depend on the time of the year when the earthwork is performed and the prevailing weather conditions. The need to overexcavate unstable soils from below proposed paved areas should be determined by the geotechnical engineer at the time of construction. Excavations to remove wet, soft soils should be backfilled with granular controlled compacted fill or AASHTO No. 57 stone aggregate.

Difficult excavation due to occasional boulders within the glacial overburden soils and shallow bedrock will be encountered throughout the site. Refusal to further excavation with the drill rig auger was encountered on bedrock at depths ranging up to about 8 feet below existing grades at the exploration locations. We recommend that the construction documents identify all excavation as "unclassified." Otherwise, your agreement should include a definition of rock. An example definition of rock for contractual purposes is presented below:

> Rock is defined as massive bedrock that cannot be dislodged by a D-9 Caterpillar bulldozer, or equivalent, equipped with a hydraulically operated power ripper, or by a Caterpillar 245 excavator, or equivalent, equipped with rock teeth but without the use of hoe rams or other breaking techniques. Boulders or masses of rock exceeding one cubic yard in volume shall also be considered rock excavation. This classification does not include materials such as loose rock,

concrete or other materials that can be removed by means other than breaking by hoe rams, etc., but which for reasons of economy in excavating the contractor chooses to remove by other methods.

We recommend that a rock excavation allowance be established for this project and be included in the base bid with add/deduct unit prices per cubic yard (measured in-place) to adjust the base allowance. Blasting, if required, should be performed by a blasting contractor licensed in the State of Massachusetts. All blasting should be completed prior to constructing nearby improvements, such as footings, utilities, and retaining walls. Other rock removal techniques, such as the use of a hoe-ram, or pre-drilling and splitting may be required to excavate and remove bedrock adjacent to the existing building. We recommend that the peak particle velocities be limited to two inches per second adjacent to existing structures or utilities to remain. It may be prudent to monitor the vibrations induced on existing nearby improvements by the rock removal operations.

A summary of the approximate refusal depths and corresponding refusal elevations is presented in the following table. Please note that the elevations shown in the table are based on interpolation between contours shown on the topographic plan and should be considered approximate. This information is presented for planning purposes only, and variations from these depths/elevations should be anticipated between the explored locations.

SUMMARY OF BEDROCK INFORMATION

Exploration Number	Surface Elevation	Depth to Refusal	Approx. Refusal Elev.
B-1	220.0	4.0	216.0
B-2	217.5	9.0	208.5
B-3	226.5	4.0	222.5
B-4	226.0	3.5	222.5
B-5	221.0	3.5	217.5
B-6	214.0	0.2	213.8
B-7	207.0	8.5	198.5
B-8	216.0	1.5	214.5

Note: Elevations interpolated from survey data shown on *Existing Conditions Plan, dated 08/01/2014 prepared by Marchionda & Associates, L.P.*

All construction excavations should be sloped and shored in accordance with OSHA excavation regulations or stricter local governing safety codes. It is our opinion that the undisturbed natural soils or controlled compacted fill composed of similarly graded materials would generally be classified as "Type C" soils under the OSHA excavation regulations. Significantly flatter excavation side-slopes will be required where groundwater seepage occurs. Excavated rock slopes may be classified as "stable rock" depending on the orientation of the bedding planes and fractures and generally can be designed using a one horizontal on four vertical (1H:4V) depending on the direction of the bedrock bedding planes and position of joints. Permanent slopes in soils (cut or fill) should generally be designed to be no steeper than three horizontal on one vertical (3H:IV).

Considering the volume of rock that will be excavated, an on-site screening and crushing operation should be considered to process excavated cobbles, boulders, and rock into particle sizes suitable for reuse as fill, backfill, or stone aggregate below the building and/or pavements. It is GTA's opinion that using processed rock fragments as fill below the proposed building area (in lieu of the excavated on-site soils) will reduce the risk of excessive post-construction differential foundations settlements due to dissimilar bearing materials.

The majority of excavated on-site soils will likely be suitable for use as controlled compacted fill within proposed pavement or sidewalk areas with some limitations. Moisture conditioning of the excavated on-site soils may be required to attain the recommended degree of compaction, as the moisture contents of some of the samples tested were above the optimum moisture content for compaction purposes. The maximum particle size in structural fills should generally be limited to six inches or less for mass fills and three inches or less if used to backfill utilities, walls, or foundations. However, boulders up to 18 inches in dimension could be incorporated into the controlled fill matrix within pavement areas provided they are separated enough to allow the soil between them to be adequately compacted, and remain at least two feet below the planned pavement subgrade levels, or deeper as necessary so they will not interfere with subsequent utility installation.

Off-site borrow, if required to complete the site grading operations, should meet the Unified Soil Classification System (USCS) designation SC, SM, SP, GP, GM, or GW and be approved by the geotechnical engineer prior to use.

All fill placed below proposed buildings and pavements should consist of controlled compacted fill and be installed under the observation of a geotechnical engineer or his qualified representative. Mass fill should be spread in layers on the order of eight to ten inches in loose thickness and compacted to the following specifications. Backfill placed in confined areas, such as foundation and utility excavations, should be spread in thinner layers and compacted to the same degree using manually operated compaction equipment.

COMPACTION SPECIFICATIONS

Structure / Fill Location	Compaction / Moisture Specification
Below foundations, retaining walls, floor slabs, and within wall backfill or slopes steeper than 5H:1V	95% of ASTM D-1557 Moisture: ± 3% of optimum
Top 1 foot of pavement subgrade	95% of ASTM D-1557 Moisture: ± 2% of optimum
Fills below 1 foot of pavement subgrade	90% of ASTM D-1557 Moisture: ± 3% of optimum

New fills constructed on slopes steeper than 5H:1V should be keyed into existing slopes for stability considerations. All fill slopes steeper than 5H:1V should generally be placed as controlled fill and be compacted to minimum densities as specified above. Fill for slopes in non-structural areas, such as landscape berms, can be constructed as steep as 3H:1V up to a height of ten feet.

Groundwater was not encountered in the explorations performed for this study. It should be expected that seepage of perched or trapped water may occur throughout the site, particularly at the soil-rock interface. We anticipate that such seepage will be able to be controlled by pumping from sumps located within the excavations. Positive drainage should be maintained during construction to prevent inundation of subgrade soils by surface water runoff. Excavations to remove wet, soft soils should be backfilled with controlled compacted fill or AASHTO No. 57 stone aggregate.

Subsurface Utilities

It is our opinion that the natural soils and controlled compacted fill are considered suitable for support of subsurface utilities, which will likely include water and sewer lines. GTA recommends that a six-inch thick granular bedding layer consisting of AASHTO No. 57 stone aggregate be placed where loose/soft soil is encountered to provide uniform support as dictated by site conditions. Additional stone thicknesses may be appropriate if the water seepage is encountered in the excavations.

Contractors should provide adequate earth support and dewatering systems in utility trench excavations. Dewatering through the use of "sump and pump" techniques may be required in some areas to remove water seepage, especially if utility installation is performed during the wet season or after prolonged periods of inclement weather.

Utilities installed below pavements and other structural areas should be backfilled using controlled fill, compacted in accordance with the recommendations presented in the *Earthwork* section of this report.

Foundations

It is GTA's opinion that the proposed senior living facility may be supported on conventional shallow spread foundations. Assuming maximum column and bearing wall loads of up to approximately 120 to 150 kips and 6 to 8 kips per linear foot, respectively, we believe that foundations established on the undisturbed natural soils or controlled compacted fill may be designed to impose an allowable net bearing pressure of up to 4,000 pounds per square foot. Minimum widths for wall footings of 24 inches and column footings of 30 inches are recommended to prevent a punching-type shear failure if the design, based on the above bearing pressure, results in a narrower footing. Foundations established completely on weathered rock or bedrock can be designed assuming a maximum allowable net bearing pressure of 10,000 psf.

Based on the assumed loads, settlements on the order of 1-inch total and ½-inch differential can be anticipated for footings supported by the natural soils or controlled fill. Negligible to ¼-inch

settlements should be expected for footings supported by weathered rock or bedrock. Exterior footings should be founded a minimum of 50 inches below final exterior grade to provide protection from frost action, unless un-weathered bedrock is encountered. Footings bearing directly on un-weathered bedrock are not subject to frost action. Interior foundations in permanently heated portions of the structure may be established at convenient depths below the floor slab.

Where soft/loose natural soils are encountered at the footing subgrade or within the zone of foundation stress influence, the foundation excavations should extend to stable natural materials. Footing subgrades requiring overexcavation may be backfilled to the design bearing grade with controlled compacted fill, open-graded crushed stone meeting the gradational requirements of AASHTO Size No. 57 aggregate, or concrete. The stone should be placed in approximately 12-inch thick loose lifts and be compacted by tamping with the equipment bucket or a vibrating-plate compactor. Controlled compacted fill should be placed and compacted in accordance with the recommendations presented in the *Earthwork* section of this report. The decision to undercut footings or perform other foundation remedial measures should be made in the field by the geotechnical engineer during footing construction.

Excavations for footings will encounter weathered rock and/or bedrock throughout much of the building area. Therefore, foundation excavations should be performed with heavy-duty construction equipment capable of ripping and removing weathered rock. If bedrock is encountered above the proposed foundation subgrade elevation, rock excavation techniques such as hydraulic hoe ramming may be required to fracture and remove rock. Where footings will bear on a combination of rock and soil, the foundation subgrade should be undercut at the transition zone and replaced with compacted dense-graded aggregate or processed rock fragment fill to reduce stress concentrations and differential settlement. The details of the transition zone undercutting should be provided in the field by the geotechnical engineer based on the field conditions at the time footing excavations are performed.

Should water seepage be encountered during foundation construction, the excavation should be dewatered using sumps and removing the water by pumping away from the building site. Excavations to remove wet, soft soils should be backfilled with AASHTO No. 57 stone aggregate.

Detailed foundation subgrade evaluations should be performed by a representative of GTA in each footing excavation following compaction of the subgrade soils as described above, and prior to the placement of reinforcing steel or concrete, to confirm that the recommended allowable soil bearing capacity is available. The foundation bearing surface evaluations should be performed using a combination of visual observation, hand-rod probing, Dynamic Cone Penetrometer (DCP) testing, and comparisons with the borings. Concrete placement should generally be performed the same day excavations for the footings are performed to prevent exposure and potential weakening of the foundation subgrade.

Seismic Information

Based on the results of this study, it is GTA's opinion that the subsurface conditions at the site may be categorized as Site Class B as defined in the IBC. This categorization is based on the subsurface conditions encountered in the explorations performed for this study, general geologic information for the region, and the information contained in the Code.

Floor Design

It is GTA's opinion that the floor slabs can be designed as a concrete slabs-on-grade using a design modulus of subgrade reaction (k) of 200 pounds per cubic inch (pci). The slabs may bear on wall projections; however, they should be jointed so that the foundation walls can settle slightly without affecting the slabs.

GTA recommends that the concrete floor slabs supported on grade be founded on a four-inch (minimum) coarse granular layer meeting the gradation of AASHTO Size No. 57 aggregate. Where moisture sensitive floor finishes are planned, it is generally recommended that a polyethylene vapor retarder be installed in accordance with ACI guidelines to interrupt the rise of capillary moisture through the slabs.

Floor slab subgrade soils should be evaluated by a representative of the geotechnical engineer immediately prior to stone and concrete placement. This evaluation may include a combination of visual observations, proofrolling, hand-probing and field density tests to verify that the subgrade soils have been prepared properly. Contractors should anticipate that remedial work could be required to achieve a stable subgrade prior to stone placement, even if the subgrade soils had previously been compacted to the required densities. All interior utility trenches should be backfilled and compacted in accordance with our *Earthwork* recommendations.

Pavements

GTA recommends the upper 18-inches of pavement subgrade be constructed of materials with the following characteristics:

Liquid Limit	35 or less
Plasticity Index	15 or less
Maximum Dry Density	105 pcf or greater
California Bearing Ratio (CBR)	5 or greater

The laboratory testing suggests that some of the silty (ML) soils may not meet the above criteria. Fine-grained soils such as silt are highly susceptible to disturbance and softening from excess moisture content and construction equipment traffic. Contractors should anticipate that remedial work could be required to achieve a stable subgrade prior to paving, even if the subgrade soils had previously been compacted to the required densities. For preliminary planning purposes, GTA suggests the pavements be designed based on a CBR value of 5 percent. CBR testing should be performed to confirm this estimated value. Prudent planning and earthwork procedures will reduce the potential necessity for remedial work due to disturbance caused by construction equipment. The permanent and/or temporary pavement design must consider that construction traffic will traverse paved roads that have not yet received the surface course.

Prior to construction of pavement sections, the pavement subgrade should be tested to verify design parameters and proofrolled with a loaded tandem axle dump truck under the observation of a geotechnical engineer to evaluate stability. Unsuitable soil should be overexcavated to stable

subgrade soils or a maximum depth of 18 inches below the proposed subgrade level. The resultant excavations should be backfilled with granular controlled compacted fill or subbase stone aggregate. Undercutting, reworking and drying, or the use of geosynthetics may be necessary in some areas for subgrade stabilization depending on the weather conditions at the time pavement construction proceeds.

The pavement section should be designed using applicable State or Local standards for the anticipated traffic loading. GTA should be provided the opportunity to perform or review the pavement section design.

It should be noted that large trucks could impose significant concentrated wheel loads during loading/unloading which can result in rutting and failure of asphalt pavements. Therefore, we recommend a reinforced concrete pavement section be considered in loading/unloading docks and trash dumpster pick-up areas.

The pavement section should be designed using applicable State or Local standards for the anticipated traffic loading. GTA should be provided the opportunity to perform or review the pavement section design.

ADDITIONAL SERVICES

We recommended that GTA be retained during construction of the subject project to provide geotechnical consultation and construction observation and testing services as outlined below:

- Perform additional field explorations to develop final design criteria and obtain additional information regarding the depth to sound bedrock.
- Review final site and structural plans to evaluate if they conform to the intent of this report.
- Provide on-site observation and testing of site stripping, fill excavation and replacement, subgrade evaluation, testing of controlled fills, and retaining wall construction.
- Observe compaction of excavated footing subgrades for compliance with the project drawings and the intent of this geotechnical report.

- Observe the proofrolling of floor slab and pavement subgrades to evaluate stability.
- Perform observation and materials testing during concrete and masonry construction.

LIMITATIONS

This report, including all supporting exploration logs, field data, field notes, laboratory test data, calculations, estimates and other documents prepared by GTA in connection with this Project have been prepared for the exclusive use of CSH Andover, LLC pursuant to the Agreement between GTA and CSH Andover, LLC dated July 15, 2014, and in accordance with generally accepted engineering practice. All terms and conditions set forth in the Agreement and the General Provisions attached thereto are incorporated herein by reference. No warranty, express or implied, is made herein. Use and reproduction of this report by any other person without the expressed written permission of GTA and CSH Andover, LLC is unauthorized and such use is at the sole risk of the user.

The analysis and recommendations contained in this report are based on the data obtained from limited observation and testing of the encountered materials. Test borings indicate subsurface conditions only at specific locations and times, and only at the depths penetrated. They do not necessarily reflect strata or variations that may exist between the exploration locations. Consequently, the analysis and recommendations must be considered preliminary until the subsurface conditions can be verified by direct observation at the time of construction. If variations of subsurface conditions from those described in this report are noted during construction, recommendations in this report may need to be re-evaluated.

In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report are verified in writing. GTA is not responsible for any claims, damages, or liability associated with interpretation of subsurface data or reuse of the subsurface data or engineering analysis without the expressed written authorization of GTA.

The scope of our services for this geotechnical exploration did not include any environmental assessment or investigation for the presence or absence of wetlands, or hazardous or toxic materials in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the logs regarding odors or unusual or suspicious items or conditions observed are strictly for the information of our Client.

This report and the attached logs are instruments of service. The subject matter of this report is limited to the facts and matters stated herein. Absence of a reference to any other conditions or subject matter shall not be construed by the reader to imply approval by the writer.

141270 **GEO-TECHNOLOGY ASSOCIATES, INC.**

Important Information About Your

Geotechnical Engineering Report

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

The following information is provided to help you manage your risks.

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

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

Read the Full Report

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

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

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

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

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

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

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

Subsurface Conditions Can Change

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

Most Geotechnical Findings Are Professional Opinions

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

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

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

Give Contractors a Complete Report and Guidance

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

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

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

Obtain Professional Assistance To Deal with Mold

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

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

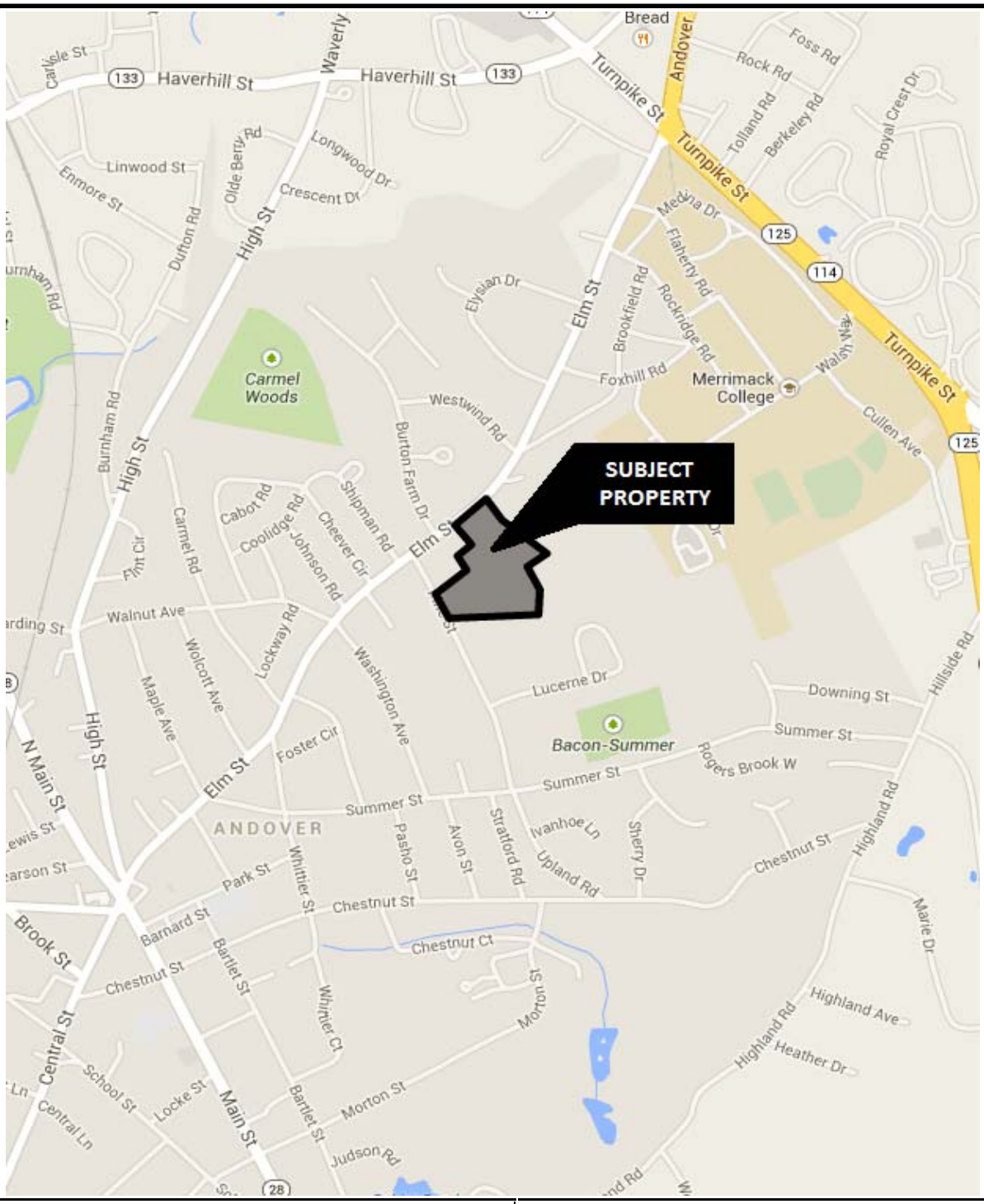
8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@asfe.org www.asfe.org

Copyright 2004 by ASFE, Inc. Duplication, reproduction, or copying of this document, in whole or in part, by any means whatsoever, is strictly prohibited, except with ASFE's specific written permission. Excerpting, quoting, or otherwise extracting wording from this document is permitted only with the express written permission of ASFE, and only for purposes of scholarly research or book review. Only members of ASFE may use this document as a complement to or as an element of a geotechnical engineering report. Any other firm, individual, or other entity that so uses this document without being an ASFE member could be commiting negligent or intentional (fraudulent) misrepresentation.

IIGER06045.0M

APPENDIX A

Figures



SITE LOCATION MAP	ANDOVER SITE
14 Worlds Fair Drive, Suite B Somerset, New Jersey 08873 (732) 271-9301 fax (732) 271-9306	Town of Andover Essex County, Massachusetts Prepared For: CHS Andovre, LLC
GEO-TECHNOLOGY ASSOCIATES, INC.	SOURCE: ESRI
	SCALE: NTS | DATE: Aug. 2014 | PROJECT #: 141270

Figure 1

*Plan based on the drawings entitled "OPTION A", prepared by Moseley Architects.

BORING LOCATION PLAN - OPTION A

14 Worlds Fair Drive, Suite B
Somerset, New Jersey 08873
(732) 271-9301
fax (732) 271-9306

GEO-TECHNOLOGY ASSOCIATES, INC.

LEGEND:

B-X Indicates the number and approximate location of the test borings performed by GTA.

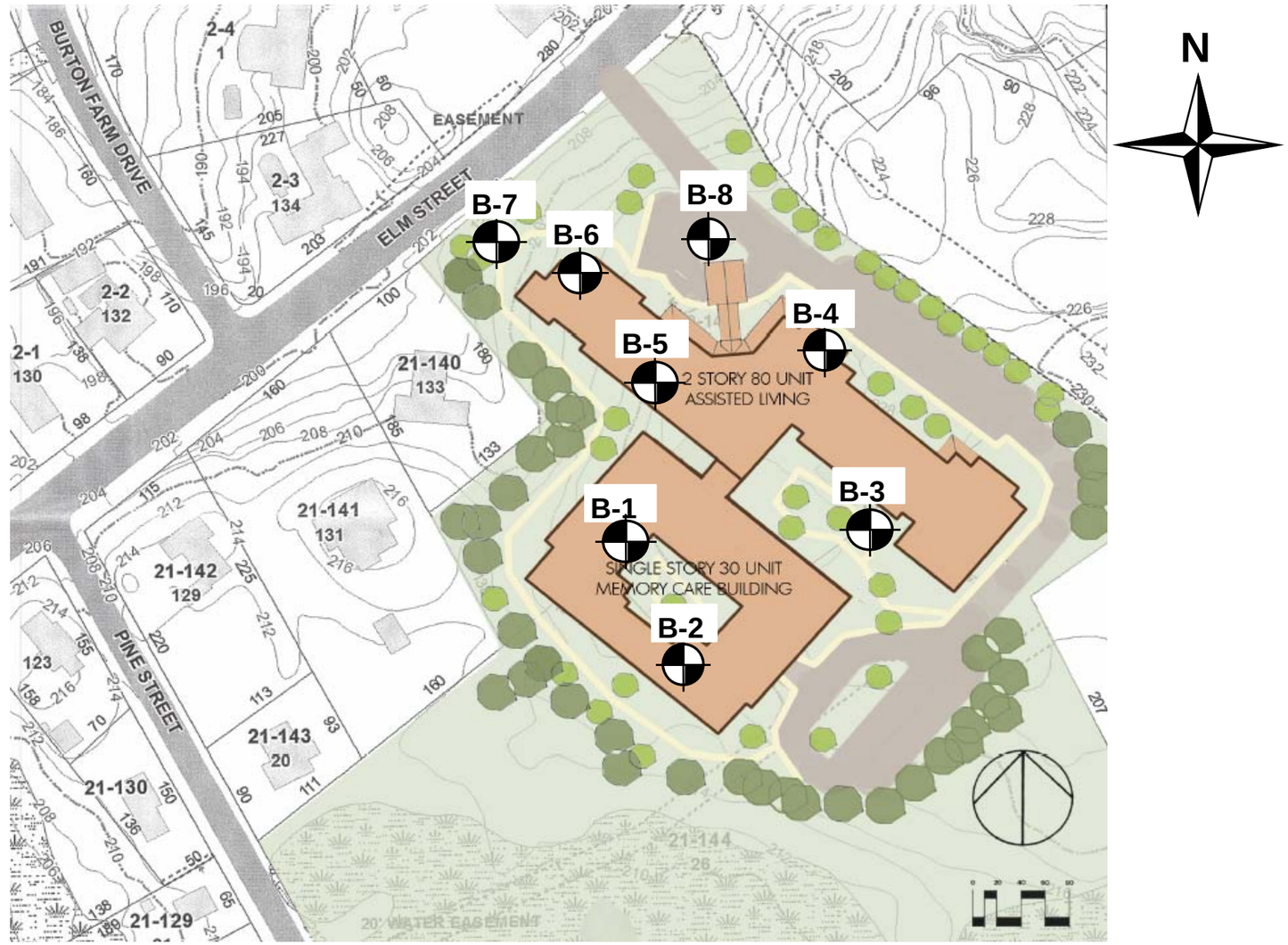
ANDOVER SITE

Town of Andover
Essex County, Massachusetts

Prepared For: CSH Andover, LLC

DESIGN BY: *	DRAWN BY: DAG	REVIEWED BY: DCL
SCALE: NTS	DATE: AUG. 2014	PROJECT #: 141270

Figure 2



*Plan based on the drawings entitled "OPTION B", prepared by Moseley Architects.

BORING LOCATION PLAN - OPTION B

14 Worlds Fair Drive, Suite B
Somerset, New Jersey 08873
(732) 271-9301
fax (732) 271-9306

GEO-TECHNOLOGY ASSOCIATES, INC.

LEGEND:

B-X Indicates the number and approximate location of the test borings performed by GTA.

Capitol Seniors Housing - Andover

143 Elm Street,
Town of Andover
Essex County, Massachusetts

Prepared For: Capitol Seniors Housing

DESIGN BY: *	DRAWN BY: DAG	REVIEWED BY: DCL
SCALE: NTS	DATE: AUG. 2014	PROJECT #: 141270

Figure 2

APPENDIX B

Exploration Logs

NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)				SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			GW
					GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			GM
					GC
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			SW
					SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			SM
					SC
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILT OR CLAY (<15% RETAINED ON THE NO. 200 SIEVE) SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED ON THE NO. 200 SIEVE) SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED ON THE NO. 200 SIEVE)		SILTS AND LEAN CLAYS LIQUID LIMIT LESS THAN 50		ML
					CL
					OL
			ELASTIC SILTS AND FAT CLAYS LIQUID LIMIT GREATER THAN 50		MH
					CH
					OH
HIGHLY ORGANIC SOILS					PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATIONS	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATIONS	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" OF PENETRATION OR LESS, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	
UPON COMPLETION OF DRILLING	
24 HOURS AFTER COMPLETION	

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF BORING NO. B-1

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **220**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					220.0	0			8 IN. of Topsoil	
S1	0.0	8	3-4-7-8	11	219.3		ML		Brown, moist, very stiff, Sandy SILT	
S2	2.0	10	24-32-100/4"	132					-with gravel	-hard augering from 2 FT to 4 FT.
					216.0		ROCK			
					215.5	5			Boring completed at 4-1/2 FT. due to refusal on gray and orange, very dense, highly weathered rock.	
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-1

LOG OF BORING NO. B-2

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **217.5**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					217.5	0			8 IN. of Topsoil	
S1	0.0	15	2-2-3-4	5	216.8		ML		Orange-brown, moist, medium stiff to very stiff, Sandy SILT -with gravel	
S2	2.0	14	7-9-18-48	27						
					213.8		SM		Gray and orange, moist, very dense, Silty SAND with gravel	
S3	4.0	18	14-33-36-100/5	69		5				
					212.0		ROCK		Gray and orange, very dense, Highly-weathered ROCK	Split Spoon refusal at 5-1/2 FT. -hard augering from 6 FT. to 9 FT.
S4	6.0	5	100/5							
S5	8.0	2	75/2							
					208.5				Boring completed at 9 FT. due to refusal on bedrock.	
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-2

LOG OF BORING NO. B-3

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **226.5**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S1	0.0	2	3-3-4-3	7	226.5	0			Topsoil	
S2	2.0	2	75/3		224.5		GP		Gray and orange-brown, moist, very dense, Poorly-graded GRAVEL with sand	-Hit a large cobble or boulder at 2 FT.
					222.5	4			Boring completed at 4 FT. due to refusal on bedrock.	
						5				
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-3

LOG OF BORING NO. B-4

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **226**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					226.0	0			10 IN. of Topsoil with wood chips	
S1	0.0	17	5-6-6-15	12	225.2		SM		Orange-brown, moist, medium dense, Silty SAND with gravel	
					224.0		GP		Gray and orange-brown, moist, very dense, Poorly-graded GRAVEL with sand	-hard augering at 2-1/2 FT.
S2	2.0	7	51-100/6	100	223.0		ROCK		Gray, red and orange-brown, very dense, Highly-weathered ROCK	
					222.5	5			Boring completed at 3-1/2 FT. due to refusal on bedrock.	
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-4

LOG OF BORING NO. B-5

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **221**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S1	0.0	20	3-3-4-5	7	221.0	0			18 IN. of Topsoil	
					219.5		SM		Brown, moist, loose, Silty SAND with gravel	
S2	2.0	4	5-8-100/3	108	218.5		GP		Gray and brown, moist, medium dense to dense, Poorly-graded GRAVEL with sand	
					218.0		ROCK		Gray , orange and white, very dense, Highly-weathered ROCK	
					217.5	5			Boring completed at 3-1/2 FT. due to refusal on bedrock.	
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-5

LOG OF BORING NO. B-6

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **214**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S1	0.0	2	100/3		214.0 213.8 213.0	0	ROCK		2 IN. of Topsoil Gray and black, very dense, Highly-weathered ROCK Boring completed at 3 IN. due to refusal on bedrock.	-rock outcropping observed around the boring location -Boring was moved over 5 FT., and bedrock was encountered at the same depth.
						5				
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-6

LOG OF BORING NO. B-7

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **207**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					207.0	0			6 IN. of Topsoil	
S1	0.0	16	3-2-5-15	7	206.5		ML		Orange-brown, moist, soft to very stiff, Sandy SILT with gravel	
S2	2.0	21	14-18-27-30	45	204.5		SM		Gray-brown, moist, dense to very dense, Silty SAND with gravel	
S3	4.0	24	32-43-43-46	86		5				
S4	6.0	16	65-48-44-38	92						
					199.0		ROCK		Gray, very dense, Highly-weathered ROCK	
					198.5				Boring completed at 8-1/2 FT. due to refusal on bedrock.	
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-7

LOG OF BORING NO. B-8

PROJECT: **Capitol Seniors Housing - Andover**
PROJECT NO.: **141270**
PROJECT LOCATION: **Andover, MA**

WATER LEVEL (ft):	NE	NE	BOC
DATE:	7/24/14	7/24/14	7/24/14
CAVED (ft):	In Augers	N/A	N/A

DATE STARTED: **7/24/14**
DATE COMPLETED: **7/24/14**
DRILLING CONTRACTOR: **Soil Exploration Corporation**
DRILLER: **Brian**
DRILLING METHOD: **HSA**
SAMPLING METHOD: **SPT**

GROUND SURFACE ELEVATION: **216**
DATUM: **Topo**
EQUIPMENT: **Truckmounted**
HAMMER TYPE: **Manual**
LOGGED BY: **LC**
CHECKED BY: **DG**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
S1	0.0	10	5-10-100/3	110	216.0	0			6 IN. of Topsoil with wood	
					215.5		ML		Brown, moist, medium stiff to stiff, Sandy SILT	
					215.0		ROCK		Gray and black, very dense, Highly-weathered ROCK	
					214.5				Boring completed at 1-1/2 FT. due to refusal on bedrock.	
						5				
						10				
						15				
						20				
						25				
						30				

NOTES: **Boring locations and elevations are approximate. BOC = Backfilled on completion.**

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

LOG OF BORING NO. B-8

APPENDIX C

Laboratory Data

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	14.6	15.3	9.6	14.7	17.8	28.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	0	0	17.5981	1.9129	0.6522	0.0944				

Material Description	USCS	AASHTO
○ Brown, moist, very dense, Silty SAND with gravel	SM	A-2-4(0)

Project No. 141270 **Client:** CSH

Project: Capitol Seniors Housing - Andover

○ **Source of Sample:** B-2 **Depth:** 4 **Sample Number:** S3

Remarks:

○ NMC= 10.8%

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

Figure

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Tested By: LC/CH/MA **Checked By:** _____

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	14.6	15.3	9.6	14.7	17.8	28.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	0	0	17.5981	1.9129	0.6522	0.0944				

Material Description	USCS	AASHTO
○ Brown, moist, very dense, Silty SAND with gravel	SM	A-2-4(0)

Project No. 141270 **Client:** CSH

Project: Capitol Seniors Housing - Andover

○ **Source of Sample:** B-2 **Depth:** 4 **Sample Number:** S3

Remarks:

○ NMC= 10.8%

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

Figure

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Tested By: LC/CH/MA **Checked By:** _____

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	28.4	9.1	12.5	14.4	35.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	0	0	9.1978	1.4507	0.4235					

Material Description	USCS	AASHTO
○ Orange-brown, moist, medium dense, Silty SAND with gravel	SM	A-4(0)

Project No. 141270 **Client:** CSH

Project: Capitol Seniors Housing - Andover

○ **Source of Sample:** B-4 **Depth:** 0.83

Remarks:

○ NMC = 10.5%

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

Figure

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Tested By: LC/CH/MA **Checked By:** _____

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	26.2	8.0	4.9	12.2	20.2	28.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	0	0	30.4793	1.6950	0.4770	0.0865				

Material Description	USCS	AASHTO
○ Gray, moist, Silty SAND with gravel	SM	A-2-4(0)

Project No. 141270 **Client:** CSH

Project: Capitol Seniors Housing - Andover

○ **Source of Sample:** B-7 **Depth:** 6 **Sample Number:** S4

Remarks:

○ NMC= 9.1%

GEO-TECHNOLOGY ASSOCIATES, INC.
14 Worlds Fair Drive, Suite B
Somerset, NJ 08873

Figure

ASTM Specifications performed my include: D421, D422, D2216, D2217, and D4318.

Tested By: LC/CH/MA **Checked By:** _____

GEOTECHNICAL EXPLORATION
SUMMARY OF NATURAL MOISTURE CONTENTS
ANDOVER SITE
ESSEX COUNTY, MASSACHUSETTS

LOCATION	DEPTH (feet)	MOISTURE (%)
B1; S1	0-2	19.9
B2; S1	0-2	25.7
B2; S3	4-6	10.8
B3; S2	2-4	4.4
B4; S1	0-2	10.5
B5; S2	2-4	6.8
B7; S1	0-2	7.6
B7; S4	6-8	9.1
B8; S1	0-2	15.1

TEST PIT LOGS

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP-"A"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 4/2				S.L.	<5	<5	M	VF	
24	Bw	10YR 7/8				S.L	<5	<5	M	VF	
74	C	2.5Y 8/2	58"			L.S.	20	10	GRAN	L	

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- WEATHERED LEDGE @ BOT. OF HOLE, NO H_2O

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP "B"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 4/3				SiL	<10	<10	M	VF	
20	Bw	10YR 6/6				SiL	<10	<10	M	VF	
58	C	2.5Y 6/3	>48			SiL	20	20	GRAN.	LOOSE	GR. M/F

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- BREAKABLE WEATHERED LEDGE @ BOT., NO OBS H_2O, EGWT @ 58"

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP "C"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 4/3				S.L.	<10	<10	M	VF	
20	Bw	10YR 7/8				S.L.	<10	<10	M	VF	
60	C	2.5Y 6/4				L.S.	15	25	GR.	L	GR M/E

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- BREAKABLE WEATHERED LEDGE @ BOT., NO OBSV. H_2O, EXHVT @ 60"

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP "D"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 5/4				S.L.	<10	<10	M	VF	
20	Bw	7.5YR 6/8				S.L.	<10	<10	M	VF	
66	C	2.5Y 6/4	30"			L.S	15	20	GR.	L	GR, F/M

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- BREAKABLE WEATHERED LEDGE @ BOT., NO OBSV. H_2O, ESHWT @ 56

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP"E"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
14	A	10YR 5/3				S.L	<10	<10	M	VF	
28	Bw	10YR 6/8				S.L	<10	<10	M	VF	
80	C	2.5Y 7/2	64"			LS	15	20	Gr.	L	GR, F/M

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- RIPPABLE WEATHERED LEDGE @ BOT., NO OBS. H_2O

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP "F"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2				S.L	<10	<10	M	VF	
16	Bw	7.5YR 6/8				S.L	<10	<10	M	VF	
46	C	2.5Y 8/4				L.S	15	15	GR.	L	F/M

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- RIPPABLE WEATHERED LEDGE @ BOT., NO OBSV. H_2O, ESHWT @ 46"

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP"G"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 3/2				S.L	<10	<10	M	VF	
20	Bw	10YR 6/8				S.L	<10	<10	M	VF	
98	C	2.5Y 6/6	52"		HEAVY	L.S.	20	15	GR.	L	GRAVELLY

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- NO OBSV. H_2O

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: T.P. "H"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
10	A	10YR 3/2				S.L.	<10	<10	M	VF	
22	Bw	7.5 6/8				S.L.	10	<10	M	VF	
80	C	2.5Y 8/6	56"		FAINT	S.L.	15	15	GR	L	F/M

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- BROKEN/WEATHERED LEDGE @ BOT., NO OBS. H_2O

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP "I"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
14	A	10YR 4/2				S.L.	<10	<10	M	VF	
28	Bw	10YR 7/8				S.L.	<10	<10	M	VF	
89	C	2.5Y 7/3	70"			L.S.	15	15	GR.	L	M/C

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-94), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- REFUSAL (BOULDERS) @ BOT.?, NO OBSV. H_2O

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP "J"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 3/2				S.L.	<10	<10	M	VF	
24	Bw	7.5 6/6				S.L	10	15	M	VF	
REFUSAL		NO-C	BROKEN LEDGE								

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- NO OBSV. H_2O, BROKEN LEDGE @ BOT.

Commonwealth of Massachusetts
City/Town of ANDOVER

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

CSH OF ANDOVER (ELM ST.) 9/29/14

C. On-Site Review (Continued)

Deep Observation Hole Number: TP. "K"

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
6	A	10YR 3/2				S.L.	<10	<10	M	VF	
26	Bw	7.5 6/8				S.L.	<10	<10	M	VF	
76	C	2.5Y 6/2	52"			L.S.	15	15	GR.	L	M/C

Additional Notes:
- PERFORMED BY: J. BARROWS (SE-04), WITNESSED BY: D. DARGIE
- SEE SITE PLAN FOR LOCATION
- WEATHERED LEDGE/BOULDERS @ BOT., NO OBSV. H_2O

DEEDS

54603
Form G

265

Transfer Certificate of Title

No. 11565

From Transfer Certificate No. 4225 (4483) Originally Registered June 28, 1955 (November 20, 1956), in Registration Book 28 (30) Page 501 (333) for the Northern Registry District of Essex County.

Case No. 18975

This is to Certify that Robert J. Maye and Lisa Holiken Maye, both

of Andover in the County of Essex and Commonwealth of Massachusetts

married to each other

are

the owners in fee simple as tenants by the entirety

of that certain parcel of land situate in Andover

in the County of Essex and said Commonwealth, bounded and described as follows:

Northwesterly by Elm Street two hundred ninety seven and 61/100 (297.61) feet;

Northeasterly by the southwesterly line of a Way in a curved line four hundred fifty four and 47/100 (454.47) feet;

Southeasterly four hundred two and 34/100 (402.34) feet;

Southwesterly one hundred nine and 65/100 (109.65) feet, again

Southeasterly one hundred (100) feet by lot ninety one (91) as shown on plan hereinafter mentioned;

Southwesterly by land now or formerly of Theodore M. Lemieux one hundred thirty five and 90/100 (135.90) feet;

Northwesterly one hundred thirty two and 78/100 (132.78) feet, and

Westerly one hundred eighty (180) feet by lot C1 on said plan.

All of said boundaries are determined by the Court to be located as shown on Plan No. 18975 M, drawn by Warren M. Misick, Surveyor, dated October 20, 1952, as modified and approved by the Court, filed in the Land Registration Office, a copy of a portion of which is filed with Certificate of Title No. 3908, Book 26, Page 433, and being designated as lot ninety two (92) thereon.

The above described land has the benefit of a certain easement to pass and repass over a fifty (50) foot strip of land for all purposes for which ways are used in the Town of Andover as reserved in a deed from Lillian A. Burton to Charles H. Dufton dated November 17, 1952, filed and registered as Document No. 11611.

Property Address: 143 Elm Street, Andover, Ma
Owners Address: 143 Elm Street, Andover, Ma

Also another parcel bounded and described as follows:

Northeasterly one hundred fifty four and 82/100 (154.82) feet;

Northwesterly ninety six (96) feet by land now or formerly of Blanche D. Farnsworth;

Northerly by lot ninety (90) as shown on plan hereinafter mentioned ninety and 24/100 (90.24) feet; and

Northeasterly by land now or formerly of Blanche D. Farnsworth, two hundred sixty three and 43/100 (263.43) feet;

Southeasterly by part of lot ninety six A (96A) on said plan one hundred three and 99/100 (103.99) feet; and

Southwesterly by lot ninety eight A (98A) on said plan by several straight and curved lines ninety one and 83/100 (91.83) feet, one hundred one and 04/100 (101.04) feet, ninety three and 30/100 (93.30) feet, one hundred thirty five and 92/100 (135.92) feet, and ninety three and 36/100 (93.36) feet.

All of said boundaries are determined by the Court to be located as shown on Plan No. 18975-Q, drawn by Warren M. Mauck, Surveyor, dated October 29, 1956, as modified and approved by the Court, filed in the Land Registration Office, a copy of a portion of which is filed with Certificate of Title No. 4482, Book 36, Page 329 and being designated as lot ninety seven A (97A) thereon.

There is appurtenant to the above described land an easement, in common with others entitled thereto, consisting of the right to pass and repass over the whole of lot 98A, as shown on the above mentioned plan, for all purposes for which ways are used in the Town of Andover as reserved in deed Document No. 13898.

And it is further certified that said land is under the operation and provisions of Chapter 185 of the General Laws, and any amendments thereto, and that the title of said Robert J. Maye and Lisa Holihan Maye

to said land is registered under said Chapter, subject, however, to any of the encumbrances mentioned in Section forty-six of said Chapter, and any amendments, thereto, which may be subsisting, and subject also to as aforesaid and to the encumbrances appearing on the other side of this certificate.

Witness, JOHN E. FENTON, JR., Chief Justice of the Land Court, at Lawrence, in said County of **Essex, the** thirty first **day of** December **in the year nineteen hundred and** ninety two **at** 2 **o'clock and** 45 **minutes in the** afternoon.

Attest, with the Seal of said Court.

Assistant Recorder

Doc:111,747 04-24-2015 12:35
Ctf#:17285
Essex North Land Court Registry

QUITCLAIM DEED

Property Address: 26 Pine Street, Andover, MA 01810

I, Lisa Holihan Maye, of 139-143 Elm Street, Andover, MA 01810, in consideration of One ($1.00) Dollar and 00/100

GRANT TO Robert J. Maye and Lisa Holihan Maye, of 139-143 Elm Street, Andover, MA 01810, husband and wife, as tenants by the entirety

With ***QUITCLAIM COVENANTS***

The land in said Andover, Essex County, Massachusetts, shown as Lot 95A on Land Court Plan No. 18975Q, drawn by Warren M. Mirick, Surveyor, dated October 29, 1956, as modified and approved by the Court, filed in the Land Registration Office, a copy of a portion of which is filed with Certificate of Title No. 4482, Book 30, Page 329, and being designated as Lot numbered ninety-five A (95A) thereon.

The above described land has the benefit of a certain easement to pass and repass over a fifty (50) foot strip of land for all purposes for which ways are used in the Town of Andover as reserved in the deed from Lilla A. Burton to Charles H. Dufton, dated November 17, 1952, filed and registered as Document No. 11611; also, see a certain easement granting a right of way over Lot 98A as shown on Plan No. 18975Q, filed with Certificate No. 4482, Book 30, Page 329, said easement dated November 14, 1956, filed and registered as Document No. 13895.

Also subject to an easement to the Inhabitants of the Town of Andover dated August 16, 1962, filed and registered as Document No. 16662.

For Grantor's Title, see deed dated 12/31/1992, as Document No. 54601, Certificate No. 11564, filed with the Essex North Registry of Deeds

Essex ss. Land Court April 24, 2015
A true copy of Land Court Document 111747
Certificate 17285 Book — Page —
Registered 4/24/15 at 12 H 35 M P M
Attest: M. Paul Iannuccillo
Register of Deeds

Executed as a sealed instrument this 23rd day of April, 2015.

Lisa Holihan Maye

Commonwealth of Massachusetts

Essex, ss.

On 23rd day of April, 2015, before me, the undersigned notary public, personally appeared Lisa Holihan Maye, the above-named and proved to me through satisfactory evidence of identification being MA Drivers License, to be the person whose name is signed on this document, and acknowledged to me that he/she signed it voluntarily for its stated purpose and that the foregoing instrument is his/her free act and deed.

JOHN K. O'DONOHUE
MY COMM. EXPIRES
NOVEMBER 25, 2016
NOTARY PUBLIC
COMMONWEALTH OF
MASSACHUSETTS

Notary Public: John K. O'Donohue
My Commission Expires: November 25, 2016

LIST OF ABUTTERS

Ref # PL15-3266

134 ELM ST 2 0 3
LUC: 104

CONTE NANETTE
FOURNIER ROGER MARC JT
134 ELM ST
ANDOVER, MA 01810

138 140 ELM ST 2 0 5
LUC: 104

GRACE M BERNARDIN IRREVOC TR
BERNARDIN ROBERT+PETER TRS
138 ELM ST
ANDOVER, MA 01810

35 PINE ST 21 0 126
LUC: 101

CIOLFI SANDRA ANN
35 PINE ST
ANDOVER, MA 01810

31 PINE ST 21 0 127
LUC: 101

PIERCY STEPHEN E
PIERCY JEAN E JT
31 PINE ST
ANDOVER, MA 01810

27 PINE ST 21 0 128
LUC: 101

BLESZINSKI FAMILY REVOC TRUST
BLESZINSKI FRANCIS+CAROL TRS
27 PINE ST
ANDOVER, MA 01810

21 PINE ST 21 0 129
LUC: 101

BIGELOW BRANDON L
BLUEMAN TRACEY L TE
21 PINE ST
ANDOVER, MA 01810

139 143 ELM ST 21 0 139
LUC: 105

MAYE ROBERT J
MAYE LISA HOLIHAN TE
139 143 ELM ST
ANDOVER, MA 01810

133 ELM ST 21 0 140
LUC: 101

VIEUXLOUP JACQUES B
BOULAIN ISABELLE H E TE
133 ELM ST
ANDOVER, MA 01810

131 ELM ST 21 0 141
LUC: 101

COLLINS PAUL W
131 ELM ST
ANDOVER, MA 01810

129 ELM ST 21 0 142
LUC: 101

CAMILO ROSEANN
129 ELM ST
ANDOVER, MA 01810

20 PINE ST 21 0 143
LUC: 101

ROPIAK MYRIAM ROSE
ROPIAK JEFFREY STEPHEN TE
20 PINE ST
ANDOVER, MA 01810

26 PINE ST 21 0 144
LUC: 012

MAYE LISA H
143 ELM ST
ANDOVER, MA 01810

40 PINE ST 21 0 145
LUC: 101

JOHN P DECOURCY IRREVOC TRUST
DECOURCY BRIAN P TR
40 PINE ST
ANDOVER, MA 01810

52 PINE ST 21 0 145 A
LUC: 101

RIVAS ROLANDO
52 PINE ST
ANDOVER, MA 01810

66 PINE ST 21 0 146
LUC: 101

LAWRIE WILLIAM JR
LAWRIE SANDRA C TE
66 PINE ST
ANDOVER, MA 01810

76 PINE ST 21 0 147
LUC: 950

AVIS
PO BOX 5097
ANDOVER, MA 01810

67 LUCERNE DR 21 0 155
LUC: 101

JIN SONG
LU JUN TE
67 LUCERNE DR
ANDOVER, MA 01810

63 LUCERNE DR 21 0 156
LUC: 101

WANG HANLI
JHANG JU TE
63 LUCERNE DR
ANDOVER, MA 01810

59 LUCERNE DR 21 0 157
LUC: 101

TRAHAN MICHAEL R
TRAHAN LAUREN A TE
59 LUCERNE DR
ANDOVER, MA 01810

3 FARNSWORTH RD 3 0 2
LUC: 101

LORI M PAGLIA REVOC TRUST-2000
PAGLIA LORI + PETER TRS
3 FARNSWORTH RD
ANDOVER, MA 01810

147 ELM ST 3 0 3
LUC: 101

ONE 47 ELM ST REALTY TRUST
DOWNS WILLIAM+BERNICE TRS
147 ELM ST
ANDOVER, MA 01810

0 ELM ST 3 0 4
LUC: 946

AUGUSTINIAN COLLEGE
THE MERRIMACK VALLEY
315 TURNPIKE ST
NORTH ANDOVER, MA 01845

145 ELM ST 3 0 4 A
LUC: 132

MAYE ROBERT J
MAYE LISA HOLIHAN TE
143 ELM ST
ANDOVER, MA 01810