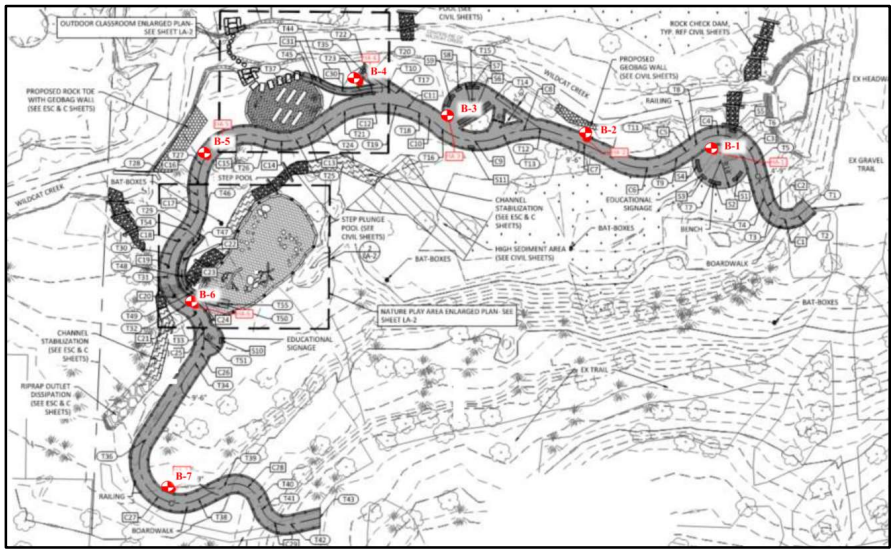
REPORT of SUBSURFACE EXPLORATION and PRELIMINARY GEOTECHNICAL ENGINEERING EVALUATION



Dunwoody Nature Center Boardwalk

Dunwoody, Dekalb County, Georgia

PREPARED FOR:

City of Dunwoody
4800 Ashford Dunwoody Road
Dunwoody, Georgia, 30338

NOVA Project Number: 10103-2024018

April 24, 2024

NOVA

PROFESSIONAL | PRACTICAL | PROVEN

April 24, 2024

CITY OF DUNWOODY
4800 Ashford Dunwoody Road
Dunwoody, Georgia, 30338

Attention: Mr. Carl Thomas Sr. CSM, CFM
Stormwater Utility Manager

Subject: Report of Subsurface Exploration and
Preliminary Geotechnical Engineering Evaluation
DUNWOODY NATURE CENTER BOARDWALK
Dunwoody, Dekalb County, Georgia
NOVA Project Number 10103-2024018

Dear Mr. Thomas:

NOVA Engineering and Environmental, LLC (NOVA) has completed the authorized subsurface exploration and preliminary geotechnical engineering evaluation for the Dunwoody Nature Center Boardwalk located in Dunwoody, Dekalb County, Georgia. The work was performed in general accordance with NOVA Proposal Number 10103-2024018 dated March 5, 2024. This report briefly discusses our understanding of the project at the time of the subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions, and recommendations.

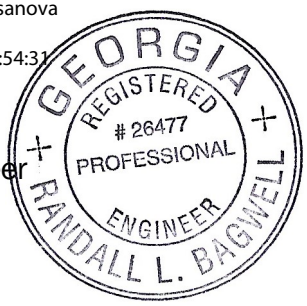
We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental, LLC
Georgia Engineering License No. PEF005170

Dante Blyden
Project Engineer

DN: cn=Randall L. Bagwell, o=Nova Engineering and Environmental LLC, email=rlbagwell@usanova.com, c=US
Date: 2024.04.24 14:54:31 -04'00'

Randall L. Bagwell, P.E.
Principal Geotechnical Engineer
GA P.E. License No. 26477



Copies Submitted: Addressee (electronic)

TABLE OF CONTENTS

1.0 INTRODUCTION

This section provides information relating to our contract, the purpose of our work and a summary of our understanding of the project requirements,

1.1 PROJECT NAME AND LOCATION

The Dunwoody Nature Center Boardwalk Project is located at 5321 Roberts Drive in Dunwoody, Dekalb County, Georgia. The Dekalb County Geographic Information System (GIS) maps the site as a portion of a parcel measuring approximately 16.9 acres identified as parcel number of 18 376 01 005. The location of the site is indicated on the Site Location Map included as Figure 1 in Appendix A.

1.2 AUTHORIZATION AND SCOPE OF STUDY

Our services on this project were as described in our Proposal Number 10103-2024018, dated March 5, 2024, which were authorized on March 6, 2024, by Mr. Carl Thomas Sr.

The primary objective of these services was to perform a shallow geotechnical exploration within the areas of the proposed construction and to assess these findings as they relate to geotechnical aspects of the planned site development. The authorized services included a site reconnaissance, hand auger borings (HABs) and sampling, field and laboratory testing, engineering evaluation of the field and laboratory data and the preparation of this report.

The assessment of the presence of wetlands, floodplains, or water classified as state waters was beyond the scope of this exploration. Additionally, the assessment of site environmental conditions, including the detection of pollutants in the soil, rock, or groundwater, at the site was also beyond the scope of this geotechnical exploration and evaluation.

2.0 PROJECT INFORMATION

Our understanding of this project is based on email correspondence with Mr. Carl Thomas of City of Dunwoody Public Works and review of the provided site plans, a site reconnaissance during boring layout, and our experience with similar projects.

2.1 SITE PLANS and DOCUMENTS

We were furnished with the following plans and documents:

- DWD23461 – Dunwoody Nature Center Boardwalk Geotechnical Scope of Work, provided by City of Dunwoody, undated.
- Dunwoody Nature Center improvement, Boardwalk Layout Plans numbered LA1 through LA-4, prepared by Freese and Nichols, dated December 2023.

2.2 PROJECT SITE

The site is currently developed as Dunwoody Nature Center with several existing buildings, associated parking, driveways and wooded walking trails. According to the provided plan, existing elevations within the planned construction limits range from approximately 1,021 feet (MSL) in the western portion of the site to 1,001 feet (MSL) in the eastern portion of the site.

2.3 PROPOSED DEVELOPMENT

The proposed construction will consist of a new boardwalk adjacent to Wildcat creek. Based on the provided documents, the boardwalk will be of wood constructed and supported by a helical pier system. Based on the provided sheet plan LA-4, the boardwalk will be a design/build project with the selected contractor responsible for developing a complete design and specification package, including design of the required galvanized steel helical pier system.

If the above project information and/or presumptions are incorrect, NOVA should be afforded the opportunity to re-evaluate the recommendations detailed herein based on the correct information. Once the project design is complete, additional field and laboratory testing may be required to finalize the geotechnical exploration.

3.0 SUBSURFACE EXPLORATION

3.1 AREA GEOLOGY

The site is in the Piedmont Geologic Region, a broad northeasterly trending geologic province underlain by crystalline rocks up to 600 million years old. The Piedmont is bounded on the northwest by the Blue Ridge Range of the Appalachian Mountains, and on the southeast by the leading edge of Coastal Plain sediments, commonly referred to as the "Fall Line". Numerous episodes of crystal deformation have produced varying degrees of metamorphism, folding, and shearing in the underlying rock. The resulting metamorphic rock types in this area of the Piedmont are predominantly a series of Precambrian age schists and gneisses, with scattered granitic or quartzite intrusions.

According to the "Geology of Georgia State Map of 1976" by Lawton et.al, 1976, the site is generally underlain by an area of quartzite (q1).

Residual soils in the region are primarily the product of in-situ chemical decomposition of the parent rock. The extent of the weathering is influenced by the mineral composition of the rock and defects such as fissures, faults and fractures. The residual profile can generally be divided into three zones:

- An upper zone near the ground surface consisting of brown red sands/silts which have undergone the most advanced weathering,

- An intermediate zone of less weathered micaceous sandy silts and silty sands, frequently described as "saprolite", whose mineralogy, texture, and banded appearance reflects the structure of the original rock, and

- A transitional zone between soil and rock termed partially weathered rock (PWR). Partially weathered rock is defined locally by standard penetration resistances exceeding 100 blows per foot.

The boundaries between zones of soil, partially weathered rock, and bedrock are erratic and poorly defined. Weathering is often more advanced next to fractures and joints that transmit water, and in mineral bands that are more susceptible to decomposition. Boulders and rock lenses are sometimes encountered within the overlying PWR or soil matrix. Consequently, significant fluctuations in depths to materials requiring difficult excavation techniques may occur over short horizontal distances.

3.2 LOCAL EXPERIENCE

NOVA has previously conducted geotechnical studies in the general site area including Spalding Drive Catch Basin Subgrade Exploration for the City of Dunwoody. The typical subsurface conditions during our services explorations were found to consist of existing fill, alluvial and residual soils composed of micaceous silty medium to fine SAND and fine sandy SILT. There were no geologic concerns identified during these previous explorations.

3.3 FIELD EXPLORATION

Test locations were established in the field by NOVA personnel using a handheld GPS device and estimating distances and angles from site landmarks. Prior to initiating field testing, underground utilities were marked by a private utility locating firm. Underground utility related adjustments of the test locations were made at the time of the field exploration. The approximate test locations are shown on Figure 3 in Appendix A. If increased accuracy is desired by the client, test locations and elevations should be surveyed.

Our field exploration was conducted during the period of March 20 through March 21, and included the following:

- Seven (7) Hand Auger Borings (HABs) and 5 offset HABs drilled to depths ranging from 2 to 8 feet below the existing ground surface. Dynamic Cone Penetrometer (DCP) testing conducted in general accordance with ASTM D-6951 was performed at 1-foot intervals in the 7 primary HABs.

Test Boring Records in Appendix B show the DCP penetration test resistances and present the soil conditions encountered in the borings.

3.4 LABORATORY TESTING

Following completion of the field exploration, soil samples obtained were returned to our office for visual classification and laboratory testing of representative samples. The tests completed included the following:

- Manual/Visual Soil Classification
- Natural Moisture Content
- Atterberg Limits
- Sieve Analysis
- Organic Content

The purpose of the testing program was to classify the subsurface materials relative to the Unified Classification System and to determine their physical characteristics. Detailed descriptions of the tests conducted are presented in Appendix C.

The soil samples will be discarded following the submittal of this report, unless you request otherwise.

3.5 SUBSURFACE CONDITIONS

The following paragraphs provide generalized descriptions of the subsurface profiles and soil conditions encountered by the borings conducted during this exploration.

The Test Boring Records in Appendix B should be reviewed to provide more detailed descriptions of the subsurface conditions encountered at each boring location. These records represent our interpretation of the subsurface conditions based on the field logs and visual observations of samples by an engineer. The lines designating the interface between various strata on the Boring Records represent the approximate interface locations and elevation. The actual transition between strata may be gradual. Groundwater levels shown on the Boring Records represent the conditions at the time of drilling. It should be understood soil conditions may vary between boring locations.

3.5.1 ALLUVIUM

Alluvial (water deposited) soils were encountered in all borings. The alluvium generally consisted of very loose to very dense silty medium to fine SAND and very soft to stiff medium to fine sandy SILT with varying amounts of roots and quartz fragments. Penetration resistance values ranged from 1 to 25+ blows per 1¾ inches, but more typically varied from 1 to 8. The higher resistance values were likely exaggerated due to the presence of the quart fragments.

3.5.2 RESIDUAL SOILS

Residual soils were encountered in 2 borings beneath the alluvial materials. The residuum generally consisted of very loose silty medium to fine SAND and firm to stiff micaceous fine sandy SILT. Penetration resistance values ranged from 3 to 10 blows per 1¾ inches.

3.5.3 HAND AUGER REFUSAL MATERIALS

Hand auger refusal materials are any hard or dense material, or obstruction such as quartz fragments/gravel which cannot be penetrated by a hand auger. Hand auger refusal was encountered in 5 of the HABs and all offset borings at

depths ranging from approximately 2 to 5 feet below existing grade. Hand auger refusal materials are shown in greater detail in the Boring Records in Appendix B of this report.

3.5.4 GROUNDWATER CONDITIONS

Groundwater in the Piedmont physiographic province of Georgia typically occurs as an unconfined or semi-confined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix, as well as fractures, joints and discontinuities in the underlying bedrock can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography. Delayed (approximately 24 hours after drilling) groundwater at depths ranging from 1½ to 5 feet below existing grade (approximate elevation ranging from 1,003 feet-MSL to 1,012 feet-MSL).

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff, and other site-specific factors. Groundwater levels in the Dekalb County area are typically lowest in the late summer-early fall and highest in the late winter-early spring, with annual groundwater fluctuations of 4 to 8 feet; consequently, the water table may vary at times.

4.0 GEOTECHNICAL ASSESSMENT

The following assessment is based on our understanding of the proposed construction, site observations, our evaluation and interpretation of the field and laboratory data obtained during this exploration, our experience with similar subsurface conditions, and generally accepted geotechnical engineering principles and local practices.

Given the shallow auger refusal of the majority of HABs completed during this exploration, limited data was collected, thus increasing the uncertainties regarding construction and foundation support of the planned boardwalk. However, given the expected low structural loads, the high settlement tolerances a wooden boardwalk can within, and the fact that helical piers are planned for foundation support, it is our professional opinion the planned boardwalk construction is feasible.

As previously stated, the HABs encountered Alluvium, and most of the HABs did not penetrate the Alluvium prior to termination. Based on correlation to the measured DCP values, these soils were on soft to very soft consistency and/or loose to very loose relative density. In addition, 2 near surface soil samples tested had organic contents greater than 5 percent. Given these conditions, added load (stress) to these soils from the boardwalk or other sources will likely result in consolidation of the Alluvium and settlement of anything supported on these soils. In addition, down-drag loads could be imposed on the helical pier system if these soils are subjected to future loads, such as fill placement. The design/build contractor should take these factors into account when developing the helical pier foundation system. Additionally, other structures such as the planned Geobag Walls, play and outdoor classroom equipment, etc. may experience settlements if supported on the soft/loose Alluvium.

It should be noted that subsurface conditions in unexplored locations may be different from those encountered at the test locations considered and discussed herein. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations, if necessary.

The following sections present our recommendations for site preparation and grading, and for the design of foundations, retaining walls, and pavements.

5.0 PRELIMINARY RECOMMENDATIONS

5.1 SITE PREPARATION & GRADING

5.1.1 General

Given the nature of the planned construction, site preparation will likely be limited to select undercutting and replacement of the soft/loose Alluvium in areas supporting miscellaneous structures that cannot tolerate a few to several inches of settlement (depending on structural loads imposed). Additionally, stabilizing subgrades in-place with fabric and stone may be required to provide a working subgrade suitable for construction.

At the time of construction, groundwater should be lowered and continuously maintained at a minimum depth of 3 feet below the working elevation of any excavations to permit subgrade preparation and to provide a stable subgrade for construction. Also, it may be prudent to place 12 to 18 inches of #57 crushed stone and/or geotextile to provide a more stable working subgrade. Based on our experience with similar conditions, and in consideration of the planned construction, we believe a conventional construction dewatering system of trenches, sumps and pumps should be possible to control both groundwater and rainfall runoff.

As previously noted, groundwater levels are subject to seasonal, climatic, and other variations and may be different at other times and locations. The extent and nature of any dewatering required during construction will be dependent on the actual groundwater conditions prevalent at the time of construction and the effectiveness of construction drainage to prevent run-off into open excavations. Additionally, most of the on-site soils had high moisture contents, which will likely require the contractor to dry the soils if they are to be reused as fill or backfill.

Based on our shallow subsurface exploration, the soils encountered should be suitable for fill and backfill provided that the soil's organic content does not exceed 3 percent by weight. Topsoil and/or organic-laden soils may be stockpiled and subsequently re-used in landscaped areas. Debris-laden materials, if present, should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations.

5.1.2 Fill Placement

In structural areas, fill should be placed in thin, horizontal loose lifts (maximum 8-inch) and compacted to at least 95 percent of the standard Proctor maximum

dry density (SPMDD per ASTM D 698). In non-structural areas, fill should be compacted to at least 92 percent of the SPMDD.

In confined areas, such as utility trenches or behind retaining walls, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary. Fill materials used in structural areas should have a target maximum dry density of at least 95 pounds per cubic foot (pcf). If lighter weight fill materials are used, the NOVA geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 3 percent of the optimum moisture content. We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. Soils excavated from near or below the groundwater table will likely require significant efforts to achieve acceptable moisture contents prior to re-use as fill.

Filling operations should be observed by a NOVA soils technician, who can confirm suitability of material used and uniformity and appropriateness of compaction efforts. The technician can also document compliance with the specifications by performing field density tests using the drive cylinder, nuclear, or sand cone testing methods (ASTM D2937, D6938, or D1556, respectively). One test per 400 cubic yards and every 2 feet of placed fill is recommended, with test locations well distributed throughout the fill mass. When filling in small areas, at least one test per day per area should be performed.

The site should be graded during construction to maintain positive drainage away from the construction areas, to prevent ponding of storm water on the site during and shortly following significant rain events. The construction areas should be sealed and crowned with a smooth roller to minimize ponding water from storm events at the end of each day of work.

5.2 HELICAL PIER FOUNDATION SYSTEM

We understand the proposed boardwalk will be supported by a helical pier system. There are various types of helical pier systems, each varying slightly based on proprietary designs by specialty foundation contractors. A helical pier has one or more metal discs or “bearing plates” that are welded in a spiral pattern around a rigid central core. The load from the foundation is passed from a connection point to the shaft, from the shaft to the discs, and from the discs to the surrounding soil. The depth of the central support, and the diameter and spacing of the bearing plates are determined by the specialty foundation contractor, generally on a design-build basis, dependent on site-specific subsurface conditions and project requirements.

The actual design pressure and settlement criteria for helical piers are provided by the specialty design/builder. However, typical ultimate design capacities of 50 to 200 kips can be achieved with a square shaft helical pier system and an ultimate capacity of 60 to 75 kips can be achieved with a hollow shaft helical pier system.

Installation of the helical piers should be monitored on a full-time basis by NOVA's geotechnical engineer. Detailed records should be maintained by the geotechnical engineer who will confirm pier size, location, installed lengths, disc spacing, tip elevations, achieved torque and other relevant information.

6.0 LIMITATIONS

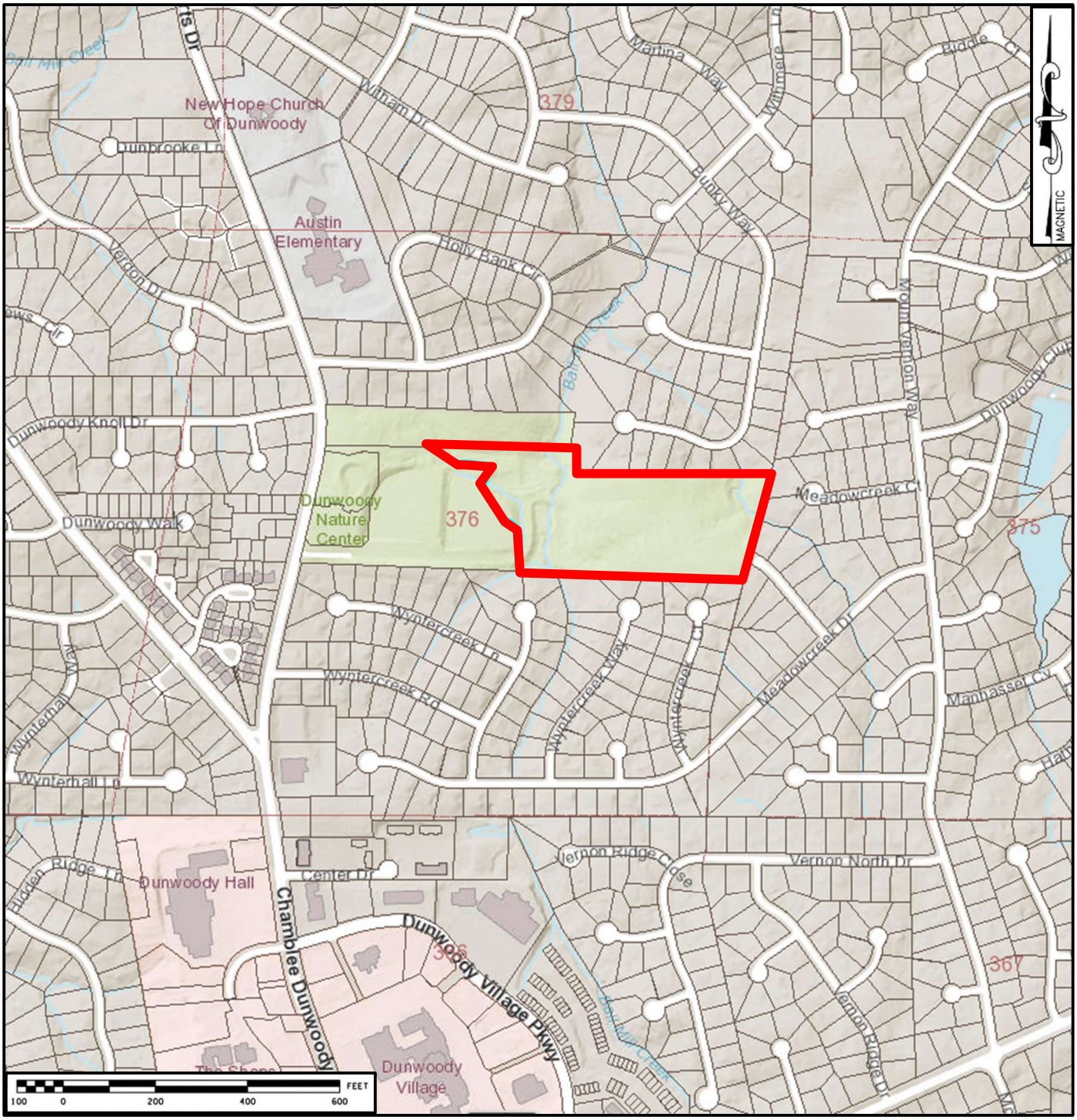
The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at significantly later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between test locations will differ from those encountered at specific test locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

This report is intended for the sole use of City of Dunwoody for the above noted project. The scope of work performed during this study may not satisfy other user's requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Georgia. This warranty is in lieu of all other statements or warranties, either expressed or implied.

APPENDIX A
Figures and Maps

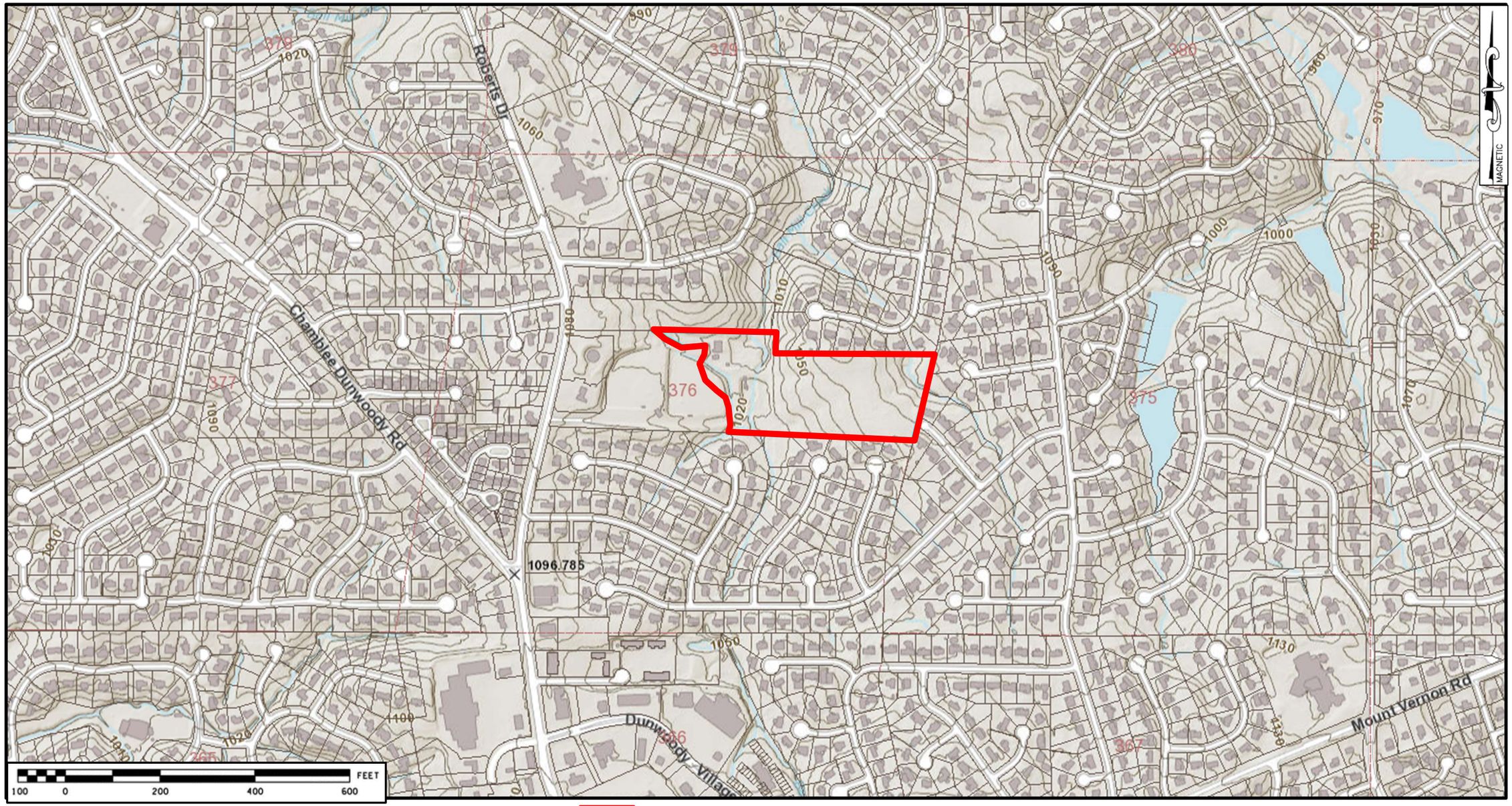


APPROXIMATE BOUNDARY OF SUBJECT PROPERTY

FIGURE 1
SITE LOCATION
Source: Dekalb County Geographic Information System (GIS) map viewer
Scale: Graphic as shown above

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

CITY OF DUNWOODY
Dunwoody Nature Center Boardwalk
Dunwoody, Dekalb County, Georgia
NOVA Project Number 10103-2024018

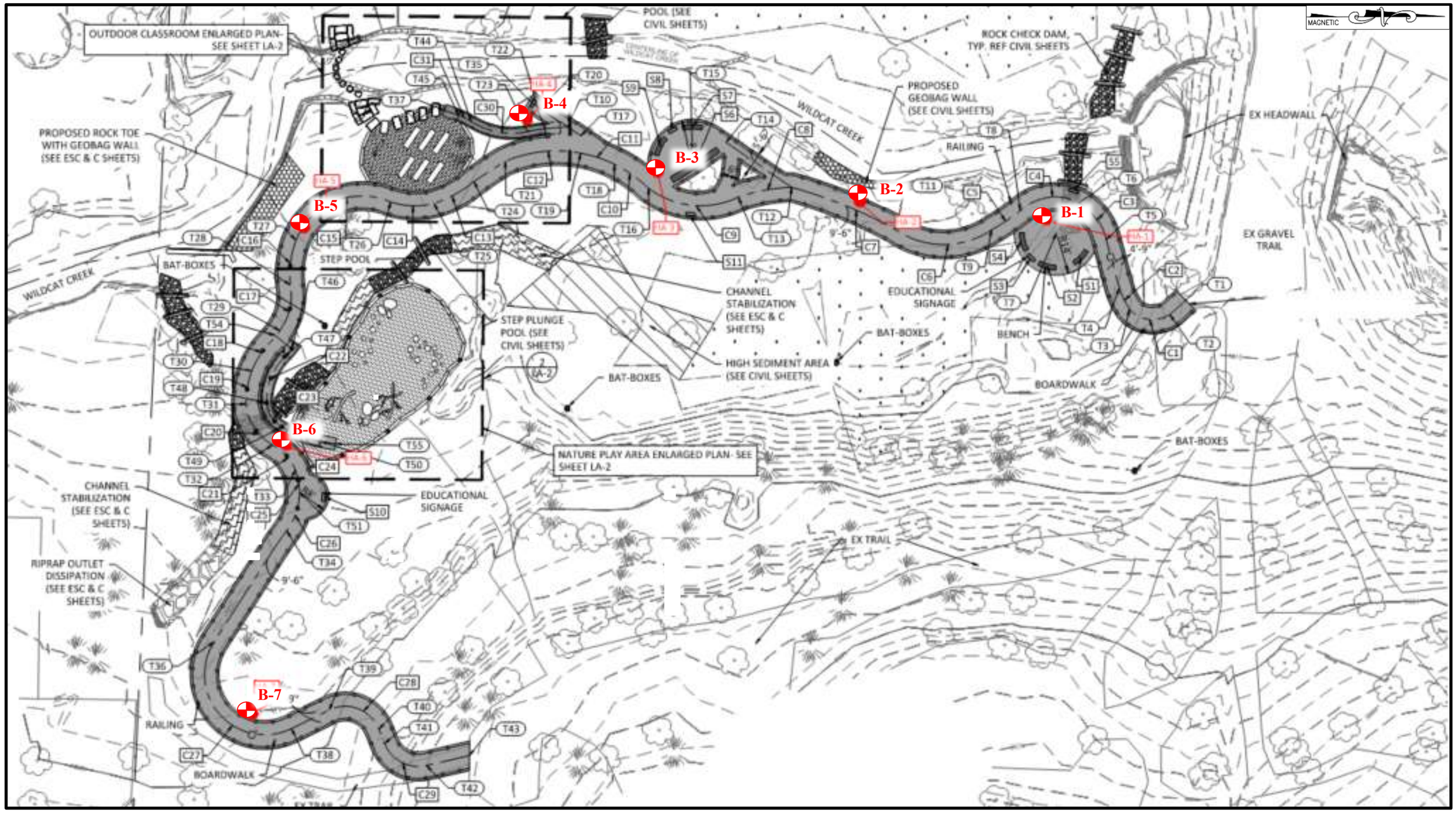


APPROXIMATE BOUNDARY OF SUBJECT PROPERTY

FIGURE 2
TOPOGRAPHIC MAP
SOURCE: Dekalb County Geographic Information System (GIS) map viewer
SCALE: Graphic as shown above

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

CITY OF DUNWOODY
Dunwoody Nature Center Boardwalk
Dunwoody, Dekalb County, Georgia
NOVA Project Number 10103-2024018

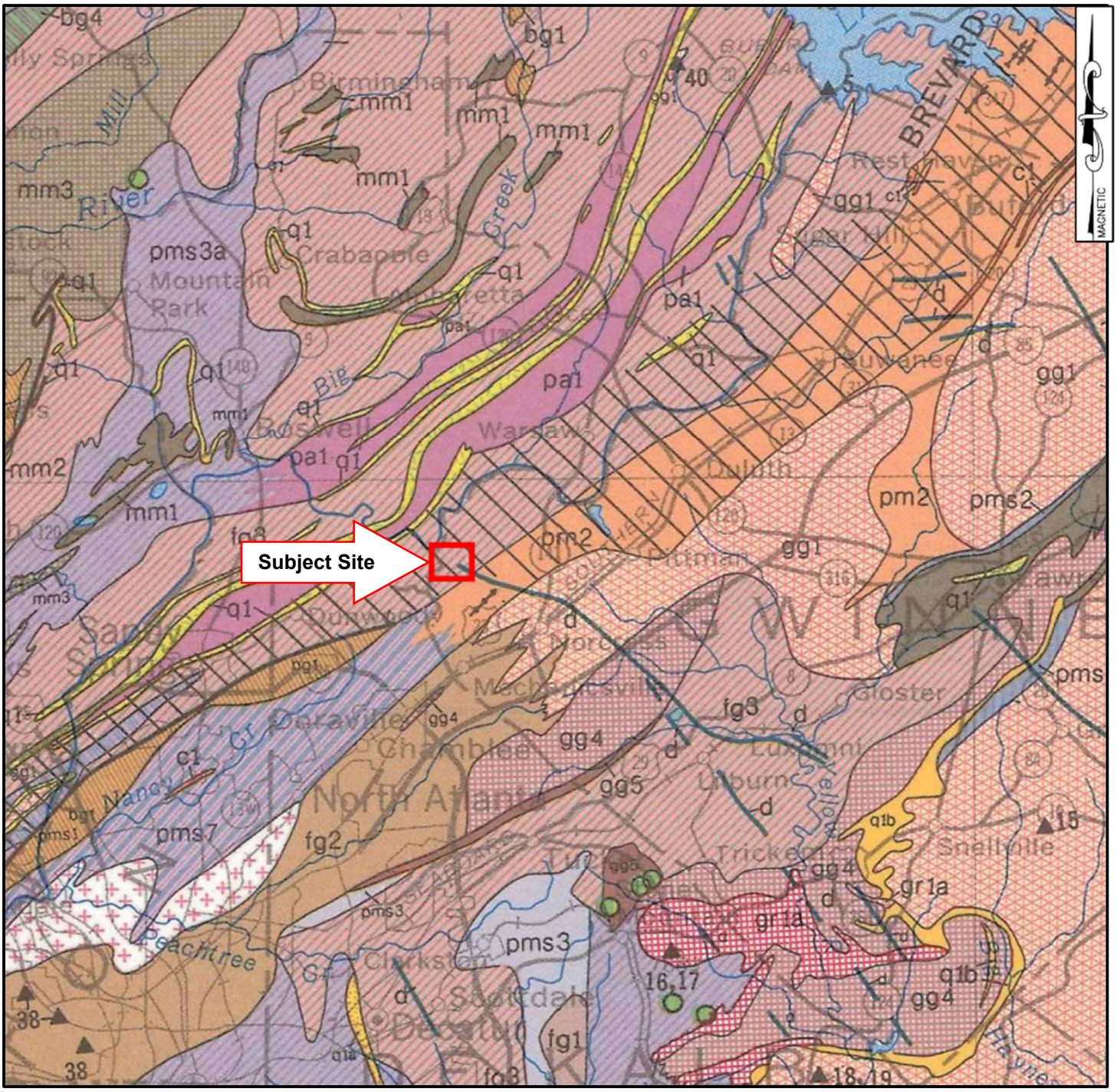


APPROXIMATE LOCATION OF NOVA HAND AUGER BORINGS

FIGURE 3
BORING LOCATION PLAN
SCALE: Refer to the Dunwoody Nature Center Improvements, Boardwalk Layout Plan, prepared by Freese and Nichols, dated December 2023
SOURCE: Dunwoody Nature Center Improvements, Boardwalk Layout Plan, prepared by Freese and Nichols, dated December 2023

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

CITY OF DUNWOODY
Dunwoody Nature Center Boardwalk
Dunwoody, Dekalb County, Georgia
NOVA Proposal Number 10103-2024018



Geologic Map of Georgia (Lawton et.al, 1976): Area consists of quartzite (q1).

APPROXIMATE BOUNDARY OF SUBJECT PROPERTY

FIGURE 4
REGIONAL GEOLOGY
Source: Geology of Georgia State Map – 1976
Scale: NTS

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

CITY OF DUNWOODY
Dunwoody Nature Center Boardwalk
Dunwoody, Dekalb County, Georgia
NOVA Project Number 10103-2024018

APPENDIX B
Subsurface Data

KEY TO SYMBOLS AND CLASSIFICATIONS

DRILLING SYMBOLS

	Dynamic Cone Penetration Testing
	Undisturbed Sample (UD)
	Auger without Sampling
	Rock Core Sample
	Standard Penetration Resistance (ASTM D1586)
	Dynamic Cone Penetrometer (DCP) Resistance
	Water Table at least 24 Hours after drilling
	Water Table 1 Hour or less after drilling
50/2"	Number of Blows (50) to Drive the Spoon a Number of Inches (2)
NX, NQ	Core Barrel Sizes: 2⅛- and 2-Inch Diameter Rock Core, Respectively
REC	Percentage of Rock Core Recovered
RQD	Rock Quality Designation - Percentage of Recovered Core Segments 4 or more Inches Long
	Loss of Drilling Fluid
N/E	Not Encountered
N/M	Not Measured
C	Boring Cave-in Depth
WOH	Weight of Hammer

DRILLING PROCEDURES

Soil sampling and standard penetration testing performed in general accordance with ASTM D1586-18[e1]. The standard penetration resistance (N-value) is the number of blows of a 140-pound hammer falling 30 inches to drive a 2-inch O.D., 1.375-inch I.D. split-barrel sampler one foot. Core drilling performed in general accordance with ASTM D2113-14. The undisturbed sampling procedure is described by ASTM D1587-15. Unless other arrangements are made, NOVA will dispose of all soil and rock samples at the time of report submission.


Paving


Gravel / Graded Aggregate Base


Fill


Topsoil


Alluvium


Poorly Graded Sand - SP


Well Graded Sand - SW

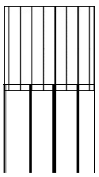

Silty Sand - SM


Clayey Sand - SC


Poorly graded silty, clayey sand - SM/SC


Clayey Sand and Gravel - SC/GC


Silty Sand and Gravel - SM/GM


Silt - ML

Elastic Silt - MH


Low Plasticity Clay - CL


High Plasticity Clay - CH


Partially Weathered Rock (PWR)


Rock

NOVA

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	Number of Blows, "N"	Approximate Relative Density
	0 – 4	Very Loose
	5 – 10	Loose
SANDS	11 – 30	Medium Dense
	31 – 50	Dense
	Over 50	Very Dense

	Number of Blows, "N"	Approximate Consistency
	0 – 2	Very Soft
	3 – 4	Soft
SILTS	5 – 8	Firm
and	9 – 15	Stiff
CLAYS	16 – 30	Very Stiff
	31 – 50	Hard
	Over 50	Very Hard

SOIL CLASSIFICATION CHART

COARSE GRAINED SOILS	**GRAVELS**	Clean Gravel less than 5% fines	GW	Well graded gravel
			GP	Poorly graded gravel
		Gravels with Fines more than 12% fines	GM	Silty gravel
			GC	Clayey gravel
	SANDS	Clean Sand less than 5% fines	SW	Well graded sand
			SP	Poorly graded sand
		Sands with Fines more than 12% fines	SM	Silty sand
			SC	Clayey sand
FINE GRAINED SOILS	**SILTS AND CLAYS** Liquid Limit less than 50	Inorganic	CL	Lean clay
			ML	Silt
		Organic	OL	Organic clay and silt
	SILTS AND CLAYS Liquid Limit 50 or more	Inorganic	CH	Fat clay
			MH	Elastic silt
		Organic	OH	Organic clay and silt
HIGHLY ORGANIC SOILS		Organic matter, dark color, organic odor	PT	Peat

PARTICLE SIZE IDENTIFICATION

GRAVELS	Coarse	¾ inch to 3 inches
	Fine	No. 4 to ¾ inch
SANDS	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40
SILTS AND CLAYS		Passing No. 200

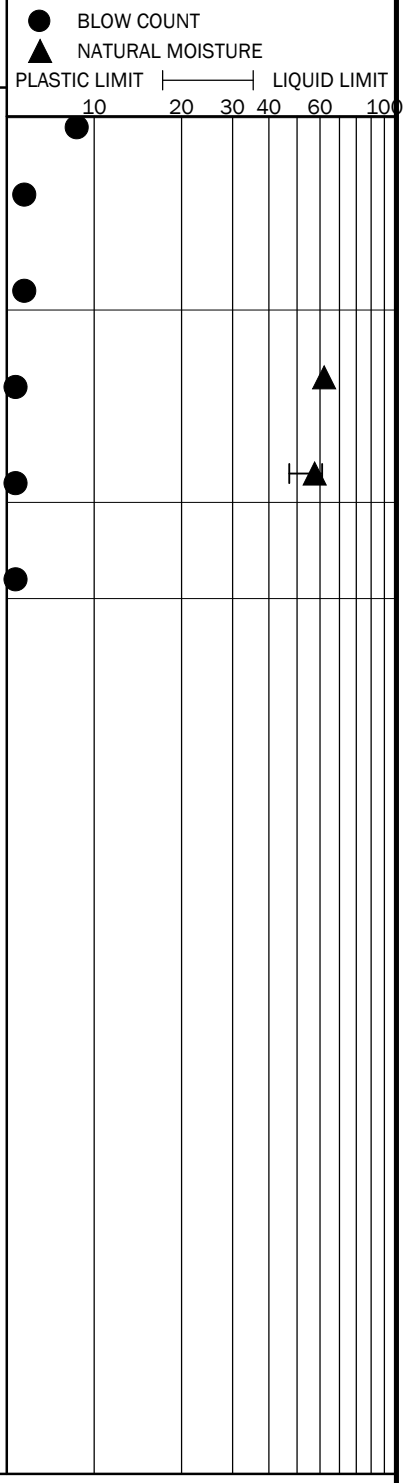
NOVA

HAND AUGER BORING RECORD B-1

PROJECT: Dunwoody Nature Center Boardwalk | PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.956056° N, -84.331947° W | ELEVATION: 1007 feet-MSL
DRILLER: NOVA | LOGGED BY: DB
DRILLING METHOD: Hand Auger | DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: 3 feet | AFTER 24 HOURS: 2 feet | CAVING> 4.5 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1006	ALLUVIUM: Firm to very soft dark brown gray clayey SILT				8
						2
2						2
	1004					1
4						1
	1002	Hand Auger Refusal at 5 feet.				1
6						
	1000					
8						
	998					
10						
	996					
12						
	994					
14						

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.

NOVA

HAND AUGER BORING RECORD
B-1a

PROJECT: Dunwoody Nature Center Boardwalk PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.956056° N, -84.331925° W ELEVATION: 1007 feet-MSL
DRILLER: NOVA LOGGED BY: DB
DRILLING METHOD: Hand Auger DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 2 feet AFTER 24 HOURS: ▼ NM CAVING> C 2 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches	Graphic Depiction
0	1006	ALLUVIUM: Dark brown clayey SILT		▽			BLOW COUNT ● NATURAL MOISTURE ▲ PLASTIC LIMIT ⊢—⊣ LIQUID LIMIT 10 20 30 40 60 100
2	1004	Hand Auger Refusal at 2 feet.					
4	1002						
6	1000						
8	998						
10	996						
12	994						
14							

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
Boring offset by 5 feet East from B-1.

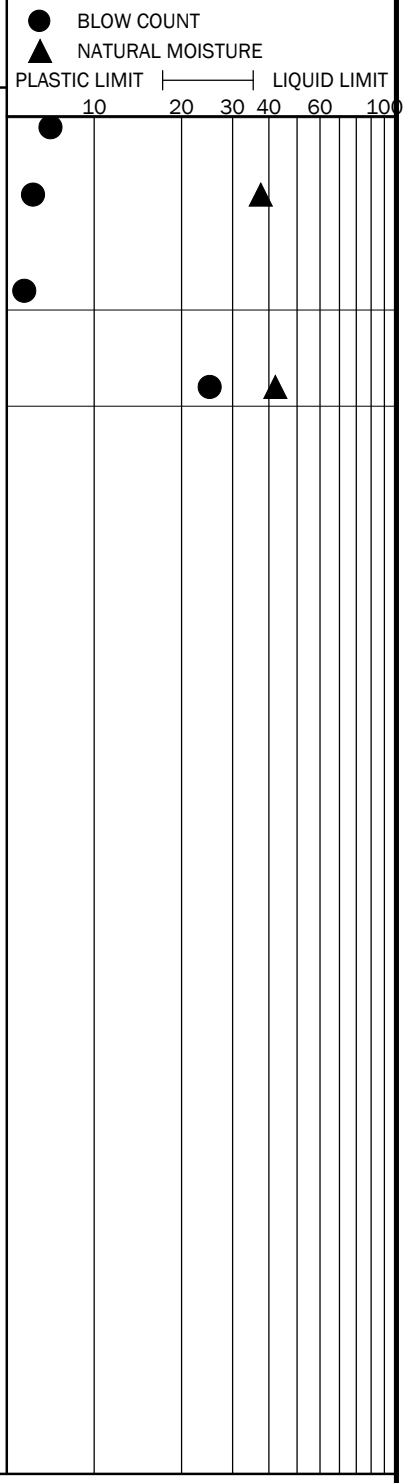
NOVA

HAND AUGER BORING RECORD B-2

PROJECT: Dunwoody Nature Center Boardwalk | PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955894° N, -84.331967° W | ELEVATION: 1006 feet-MSL
DRILLER: NOVA | LOGGED BY: DB
DRILLING METHOD: Hand Auger | DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 3 feet | AFTER 24 HOURS: ▼ 3 feet | CAVING> C 3 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1006	ALLUVIUM: Loose brown silty medium to fine SAND with tree roots				5
						3
2	1004	Very soft gray orange and brown medium to fine sandy SILT with quartz fragments and tree roots				2
		Very hard gray orange and brown medium to fine sandy SILT with quartz fragments		▽		25+
4	1002	Hand Auger Refusal at 3 feet.				
6	1000					
8	998					
10	996					
12	994					
14	992					

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
DCP values may have been exaggerated where quartz fragments were present.

NOVA

HAND AUGER BORING RECORD B-2a

PROJECT: Dunwoody Nature Center Boardwalk | PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955892° N, -84.33195° W | ELEVATION: 1006 feet-MSL
DRILLER: NOVA | LOGGED BY: DB
DRILLING METHOD: Hand Auger | DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: 2 feet | AFTER 24 HOURS: NM | CAVING> 3 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches	Graphic Depiction
0	1006	ALLUVIUM: Brown silty medium to fine SAND with tree roots					BLOW COUNT; NATURAL MOISTURE; PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40 60 100
		Gray orange and brown medium to fine sandy SILT with quartz fragments and tree roots					
2	1004						
		Hand Auger Refusal at 3 feet.					
4	1002						
6	1000						
8	998						
10	996						
12	994						
14	992						

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
Boring offset by 5 feet East from B-2.

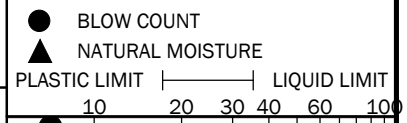
NOVA

HAND AUGER BORING RECORD B-3

PROJECT: Dunwoody Nature Center Boardwalk | PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955717° N, -84.331994° W | ELEVATION: 1008 feet-MSL
DRILLER: NOVA | LOGGED BY: DB
DRILLING METHOD: Hand Auger | DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 2 feet | AFTER 24 HOURS: ▽ 2 feet | CAVING> ⊂ 3 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1008	ALLUVIUM: Loose brown silty medium to fine SAND				5
						3
		Very loose to loose gray brown silty fine SAND with quartz fragments				
2	1006			▽		4
				⊂		2
		Hand Auger Refusal at 3 feet.				
4	1004					
6	1002					
8	1000					
10	998					
12	996					
14	994					

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
DCP values may have been exaggerated where quartz fragments were present.

NOVA

HAND AUGER BORING RECORD
B-3a

PROJECT: Dunwoody Nature Center Boardwalk | PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.956697° N, -84.331989° W | ELEVATION: 1006 feet-MSL
DRILLER: NOVA | LOGGED BY: DB
DRILLING METHOD: Hand Auger | DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 2 feet | AFTER 24 HOURS: ▼ NM | CAVING> C 3 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches	Graphic Depiction
0	1006	ALLUVIUM: Brown silty medium to fine SAND					BLOW COUNT ● NATURAL MOISTURE ▲ PLASTIC LIMIT ⊢—⊣ LIQUID LIMIT 10 20 30 40 60 100
		Gray brown silty medium to fine SAND with rock fragments					
2	1004			▽			
		Hand Auger Refusal at 3 feet.		C			
4	1002						
6	1000						
8	998						
10	996						
12	994						
14	992						

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
Boring offset by 8 feet North from B-3.

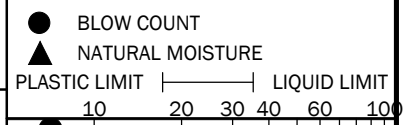
NOVA

HAND AUGER BORING RECORD B-4

PROJECT: Dunwoody Nature Center Boardwalk PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.9556° N, -84.332047° W ELEVATION: 1010 feet-MSL
DRILLER: NOVA LOGGED BY: DB
DRILLING METHOD: Hand Auger DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 2 feet AFTER 24 HOURS: ▼ 2 feet CAVING> C 2 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1010	ALLUVIUM: Loose red brown silty medium to fine SAND with tree roots				5
		Loose to very dense orange gray silty medium to fine SAND with quartz fragments and tree roots				5
2	1008	Hand Auger Refusal at 2 feet.		▽		25+
4	1006					
6	1004					
8	1002					
10	1000					
12	998					
14	996					

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
DCP values may have been exaggerated where quartz fragments were present.

NOVA

HAND AUGER BORING RECORD B-4a

PROJECT: Dunwoody Nature Center Boardwalk PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955597° N, -84.332067° W ELEVATION: 1010 feet-MSL
DRILLER: NOVA LOGGED BY: DB
DRILLING METHOD: Hand Auger DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 3.5 feet AFTER 24 HOURS: ▼ 3.5 feet CAVING> C 3.5 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1010	ALLUVIUM: Red brown silty medium to fine SAND with tree roots				
2	1008	Loose gray silty medium to fine SAND with quartz fragments				10
4	1006	Hand Auger Refusal at 3.5 feet.		▽		
6	1004					
8	1002					
10	1000					
12	998					
14	996					

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
Boring offset by 7 feet North from B-4.
DCP values may have been exaggerated where quartz fragments were present.

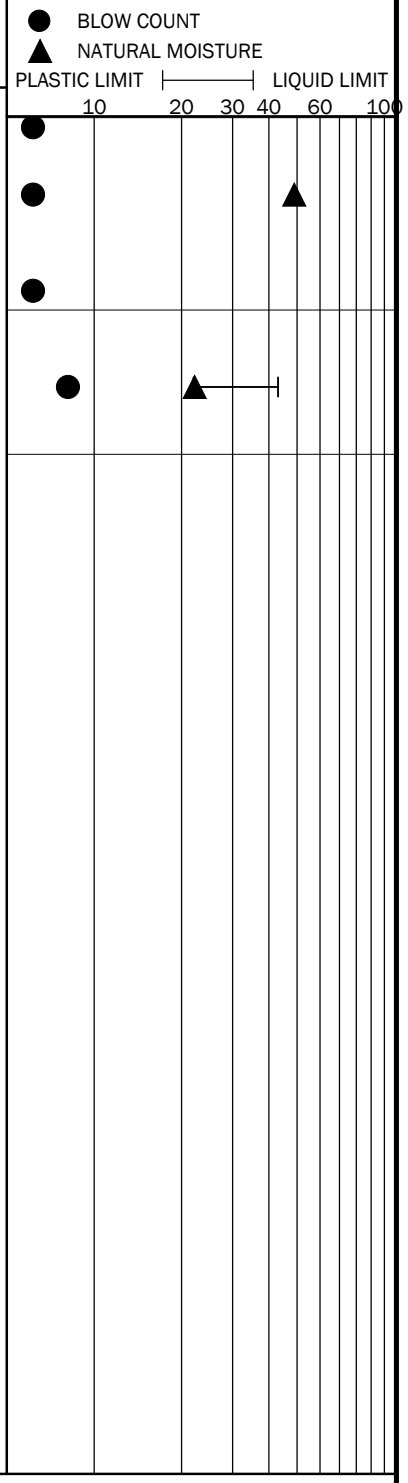
NOVA

HAND AUGER BORING RECORD B-5

PROJECT: Dunwoody Nature Center Boardwalk PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955414° N, -84.331914° W ELEVATION: 1012 feet-MSL
DRILLER: NOVA LOGGED BY: DB
DRILLING METHOD: Hand Auger DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 1.5 feet AFTER 24 HOURS: ▼ 1.5 feet CAVING> C 3.5 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1012	ALLUVIUM: Very loose brown silty fine SAND with tree roots				3
						3
2	1010	Soft to firm gray tan silty CLAY with quartz fragments		▼		3
						7
				C		
4	1008	Hand Auger Refusal at 3.5 feet.				
6	1006					
8	1004					
10	1002					
12	1000					
14	998					

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
DCP values may have been exaggerated where quartz fragments were present.

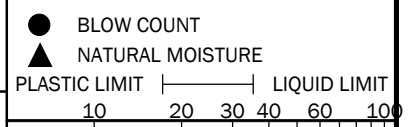
NOVA

HAND AUGER BORING RECORD
B-5a

PROJECT: Dunwoody Nature Center Boardwalk | PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955447° N, -84.331917° W | ELEVATION: 1012 feet-MSL
DRILLER: NOVA | LOGGED BY: DB
DRILLING METHOD: Hand Auger | DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 3.5 feet AFTER 24 HOURS: ▼ NM CAVING> ⊂ 4.5 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1012	ALLUVIUM: Brown silty fine SAND with tree roots				
2	1010	Gray tan silty CLAY with quartz fragments				
4	1008	Very dense light gray silty coarse to fine SAND with quartz fragments		▽ ⊂		25+
		Hand Auger Refusal at 4.5 feet.				
6	1006					
8	1004					
10	1002					
12	1000					
14	998					

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
Boring offset by 5 feet South from B-5.
DCP values may have been exaggerated where quartz fragments were present.

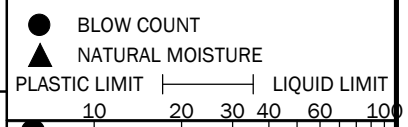
NOVA

HAND AUGER BORING RECORD B-6

PROJECT: Dunwoody Nature Center Boardwalk PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955406° N, -84.331669° W ELEVATION: 1014 feet-MSL
DRILLER: NOVA LOGGED BY: DB
DRILLING METHOD: Hand Auger DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 2 feet AFTER 24 HOURS: ▼ 2 feet CAVING> ⊂ 8 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches
0	1014	ALLUVIUM: Very loose dark brown red silty medium to fine SAND with tree roots				3
						1
		Very soft to firm red orange medium to fine sandy SILT with quartz fragments				
2	1012			▼		2
						6
4	1010					5
		Firm to stiff gray slightly micaceous medium to fine sandy SILT				8
6	1008					10
		RESIDUUM: Loose gray brown micaeous silty medium to fine SAND				8
8	1006			⊂		9
		Boring Terminated at 8 ft.				
10	1004					
12	1002					
14	1000					

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
DCP values may have been exaggerated where quartz fragments were present.

NOVA

HAND AUGER BORING RECORD B-7

PROJECT: Dunwoody Nature Center Boardwalk PROJECT NO.: 10103-2024018
CLIENT: City of Dunwoody
PROJECT LOCATION: Dunwoody, DeKalb County, Georgia
LOCATION: 33.955386° N, -84.331367° W ELEVATION: 1017 feet-MSL
DRILLER: NOVA LOGGED BY: DB
DRILLING METHOD: Hand Auger DATE: 3/20/2024
DEPTH TO - WATER> INITIAL: ▽ 5 feet AFTER 24 HOURS: ▽ 5 feet CAVING> ⊂ 8 feet

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	DCP Blows per 1-3/4 inches	Graphic Depiction
0							BLOW COUNT ● NATURAL MOISTURE ▲ PLASTIC LIMIT — LIQUID LIMIT 10 20 30 40 60 100
	1016	ALLUVIUM: Soft brown medium to fine sandy SILT				3	
						3	
2						3	
		Very loose tan silty medium to fine SAND					
	1014					4	
4						4	
	1012			▽		3	
6						3	
		RESIDUUM: Very loose gray tan silty medium to fine SAND					
	1010					3	
8				⊂		4	
		Boring Terminated at 8 ft.					
	1008						
10							
	1006						
12							
	1004						
14							

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Elevations were provided from the Boardwalk Layout Plan. The stated elevations should be considered approximate.
DCP values may have been exaggerated where quartz fragments were present.

APPENDIX C
Laboratory Data

LABORATORY TESTING

Moisture Content

The moisture content is the ratio expressed as a percentage of the weight of water in a given mass of soil to the weight of the solid particles. This test was conducted in general accordance with ASTM D-2216. A total of 14 moisture content tests were performed in this exploration. The results are summarized in the table below.

Atterberg Limits

The Atterberg Limits are different descriptions of the moisture content of fine-grained soils as it transitions between a solid to a liquid-state. For classification purposes the two primary Atterberg Limits used are the plastic limit (PL) and the liquid limit (LL). The plastic index (PI) is also calculated for soil classification.

The plastic limit (PL) is the moisture content at which a soil transitions from being in a semisolid state to a plastic state. The liquid limit (LL) is defined as the moisture content at which a soil transitions from a plastic state to a liquid state. Seven (7) tests were performed in this study in accordance with ASTM D4318. The results are provided in the table below.

Grain Size Distribution

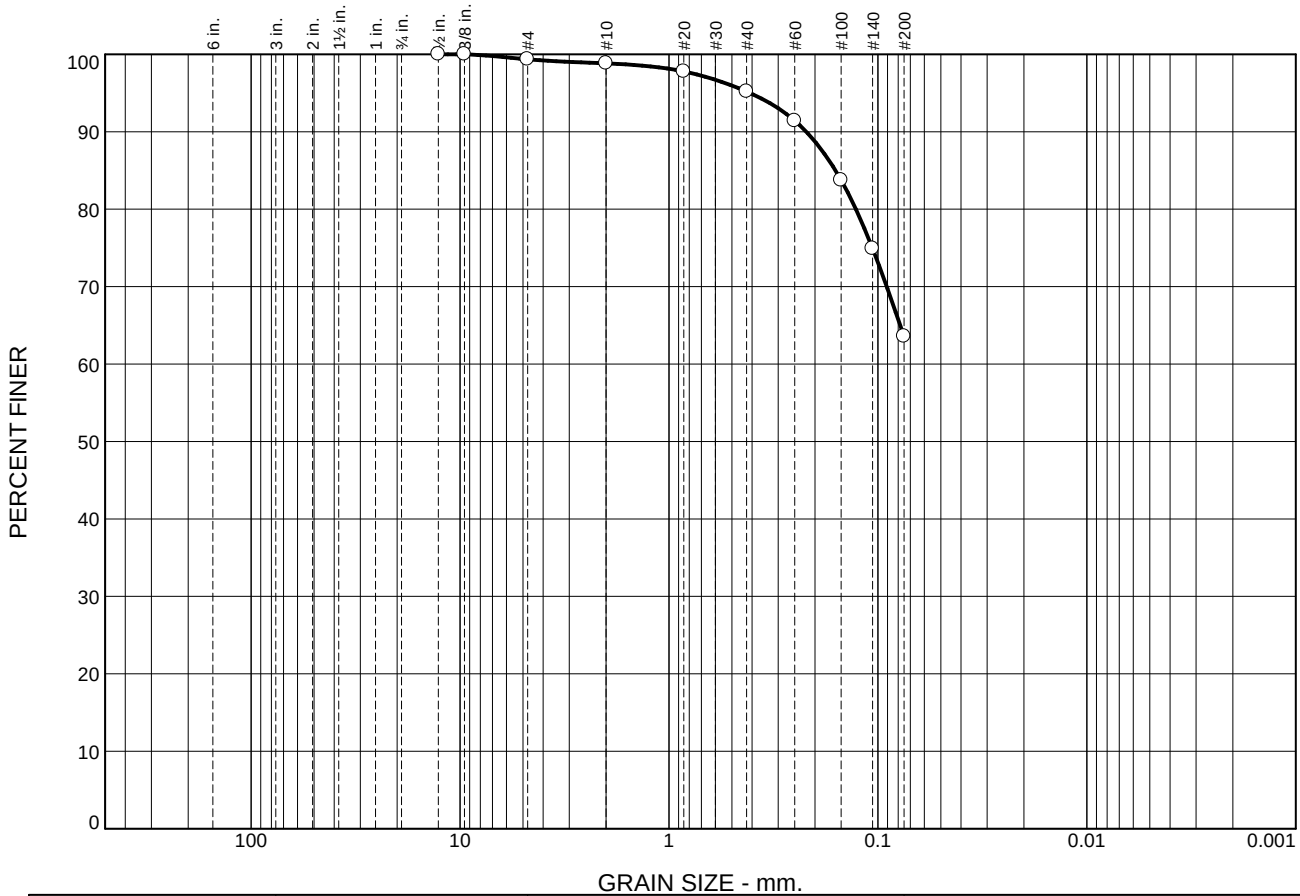
The sieve analysis consists of passing a soil sample through a series of standard sieve openings. The percentage of soil, by weight, passing the individual sieves is then recorded and generally presented in a graphical format. The percentage of fines passing through the No. 200 sieve is generally considered to represent the amount of silt and clay of the tested soil sample. The sieve analysis test was conducted in general accordance with ASTM Designation D 1140. A total of 7 sieve analysis tests were performed in this study. The results are provided in the table below.

Organic Content Test

The existing fill soils included organics consisting of small roots and stained soils. A representative sample was selected for laboratory testing to determine the organic content percentage, by weight. The organic content of a soil sample is determined by igniting an oven-dried sample at approximately 440 °C until completely ashed. A total number of 4 organic content test were performed in general accordance with ASTM D2974 Method A and are provided in the table below.

SUMMARY OF LAB TEST RESULTS							
Boring Number	Depth (ft)	Natural Moisture Content (%)	Plastic Limit (PL)	Liquid Limit (LL)	Percent Passing #200 Sieve (%)	USCS	Organic Content (%)
B-1	0-1	-	-	-	-	-	5.9
B-1	3	62.0	-	-	-	-	-
B-1	4	57.5	47	61	63.6	MH	-
B-1	5	-	-	-	62.3	MH	-
B-2	1	37.5	-	-	-	-	-
B-2	3	42.1	NP	NV	51.3	ML	-
B-3	0-1	-	-	-	-	-	5.5
B-3	2	23.6	NP	NV	-	-	-
B-3	3	20.9	-	-	-	-	-
B-4	1	16.4	NP	NV	26.7	SM	-
B-4A	3	18.1	-	-	-	-	-
B-5	1	48.9	-	-	56.0	-	-
B-5	3	22.2	22	43	-	-	-
B-6	0-1	-	-	-	-	-	3.9
B-6	3	23.1	-	-	-	-	-
B-6	7	41.3	NP	NV	28.1	SM	
B-7	0-1	-	-	-	-	-	2.8
B-7	5	35.2	-	-	39.5	SM	-
B-7	6	36.2	NP	NV	-	-	-

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.7	0.5	3.6	31.6	63.6	

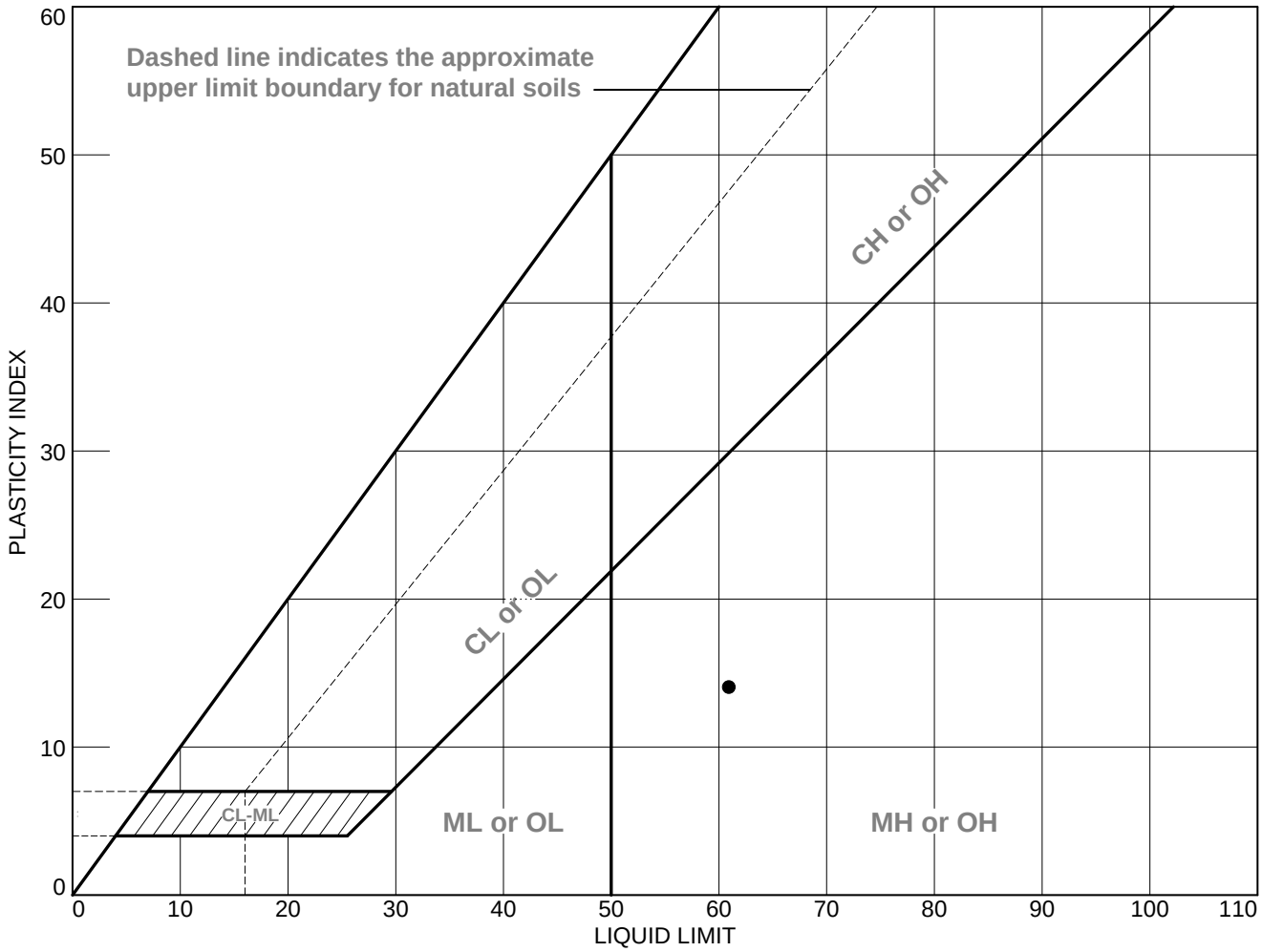
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-1	B-1	4'	Elastic SILT	MH

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk
Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



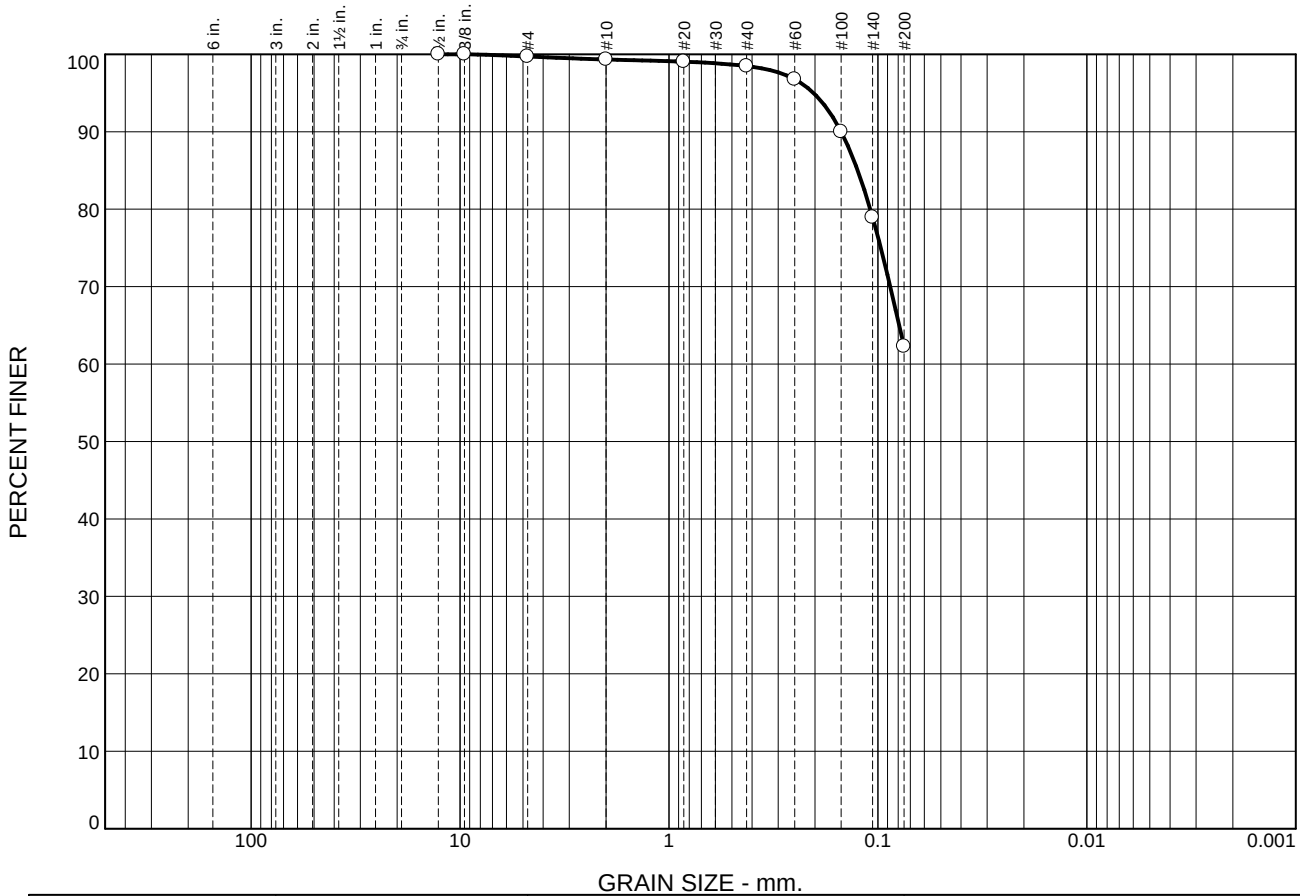
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-1	B-1	4'	57.5	47	61	14	MH

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.4	0.8	36.2	62.3	

SOIL DATA

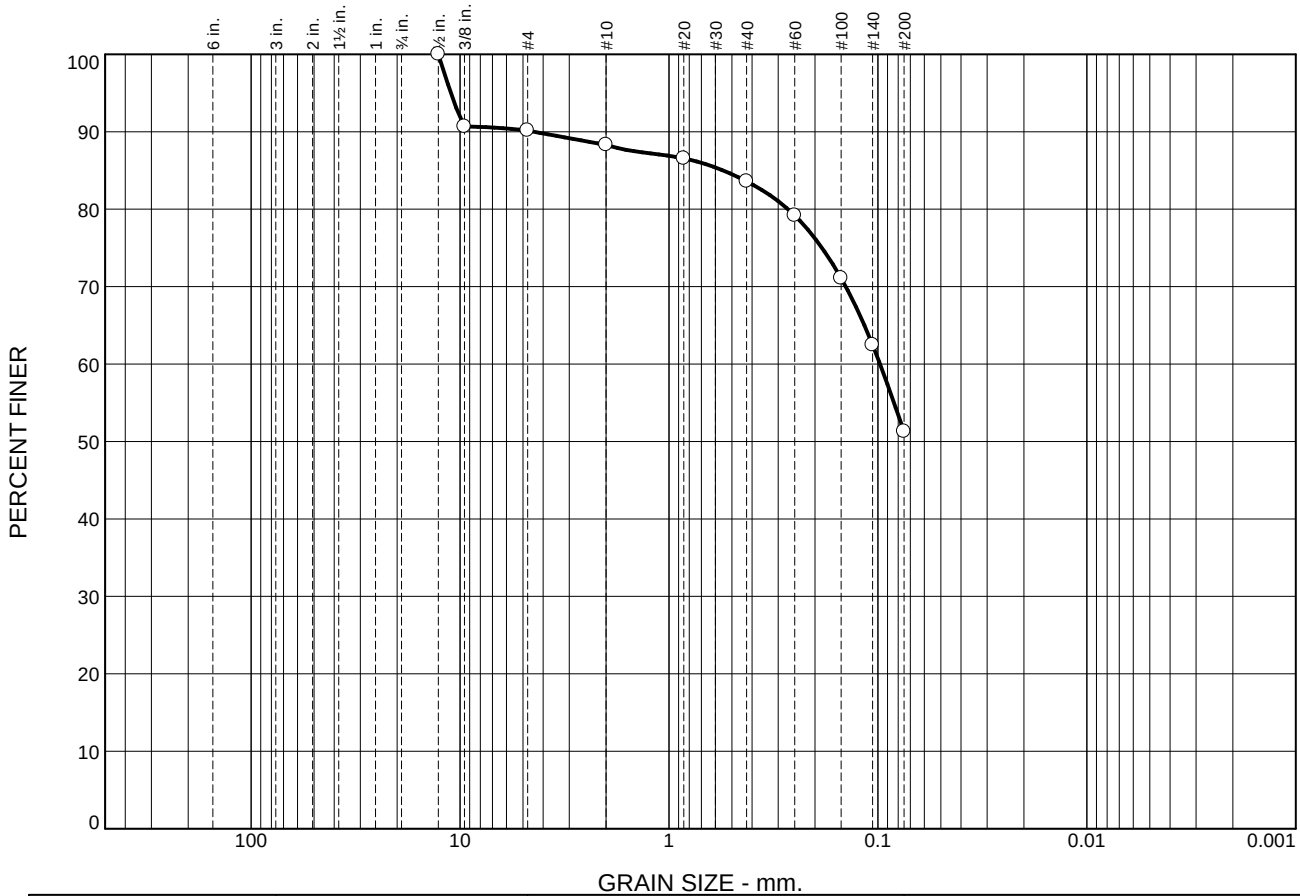
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-1	B-1	5'	Sandy SILT	ML

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	9.8	1.9	4.7	32.3	51.3	

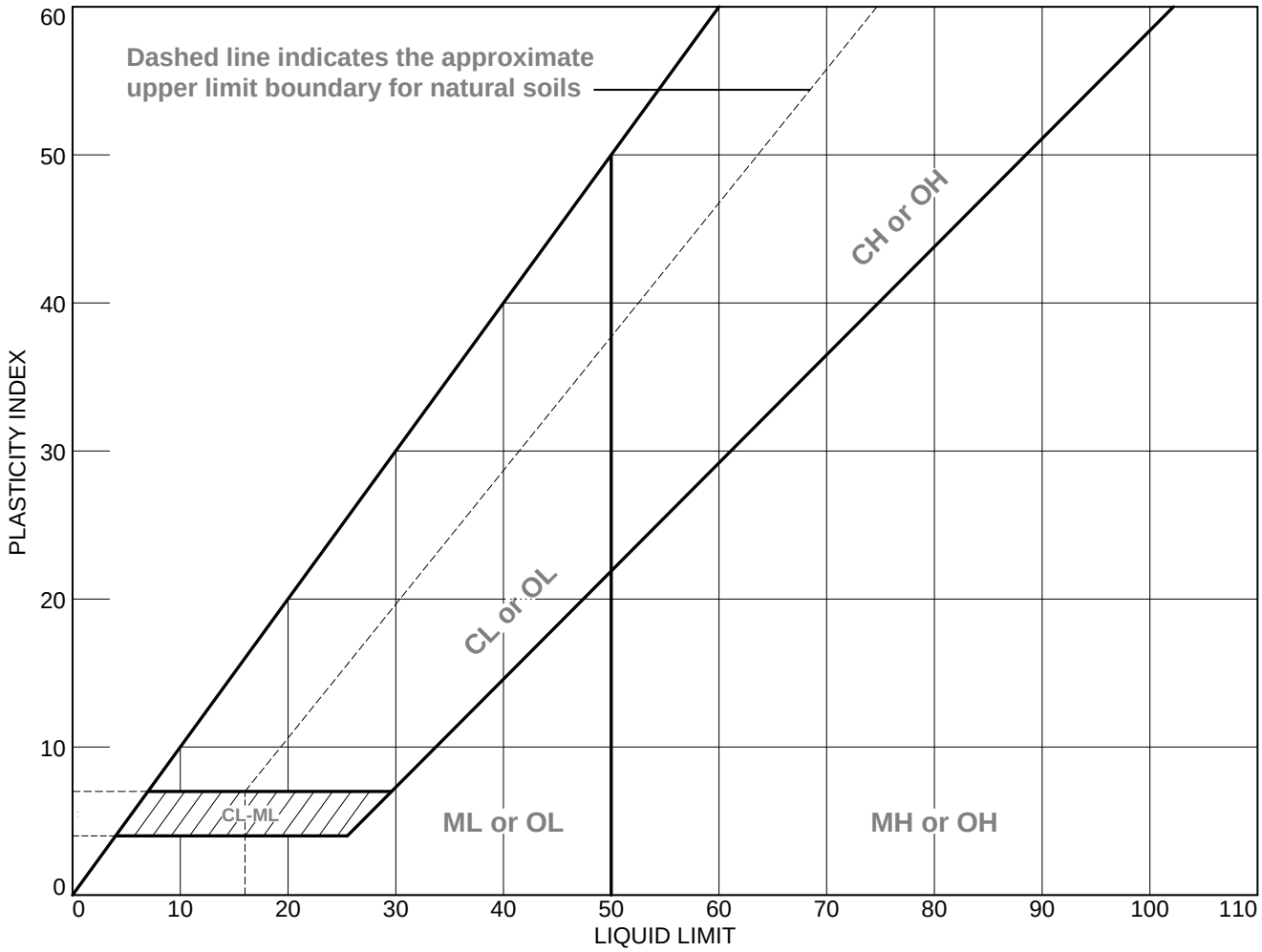
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-2	B-2	3'	Sandy SILT	ML

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk
Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



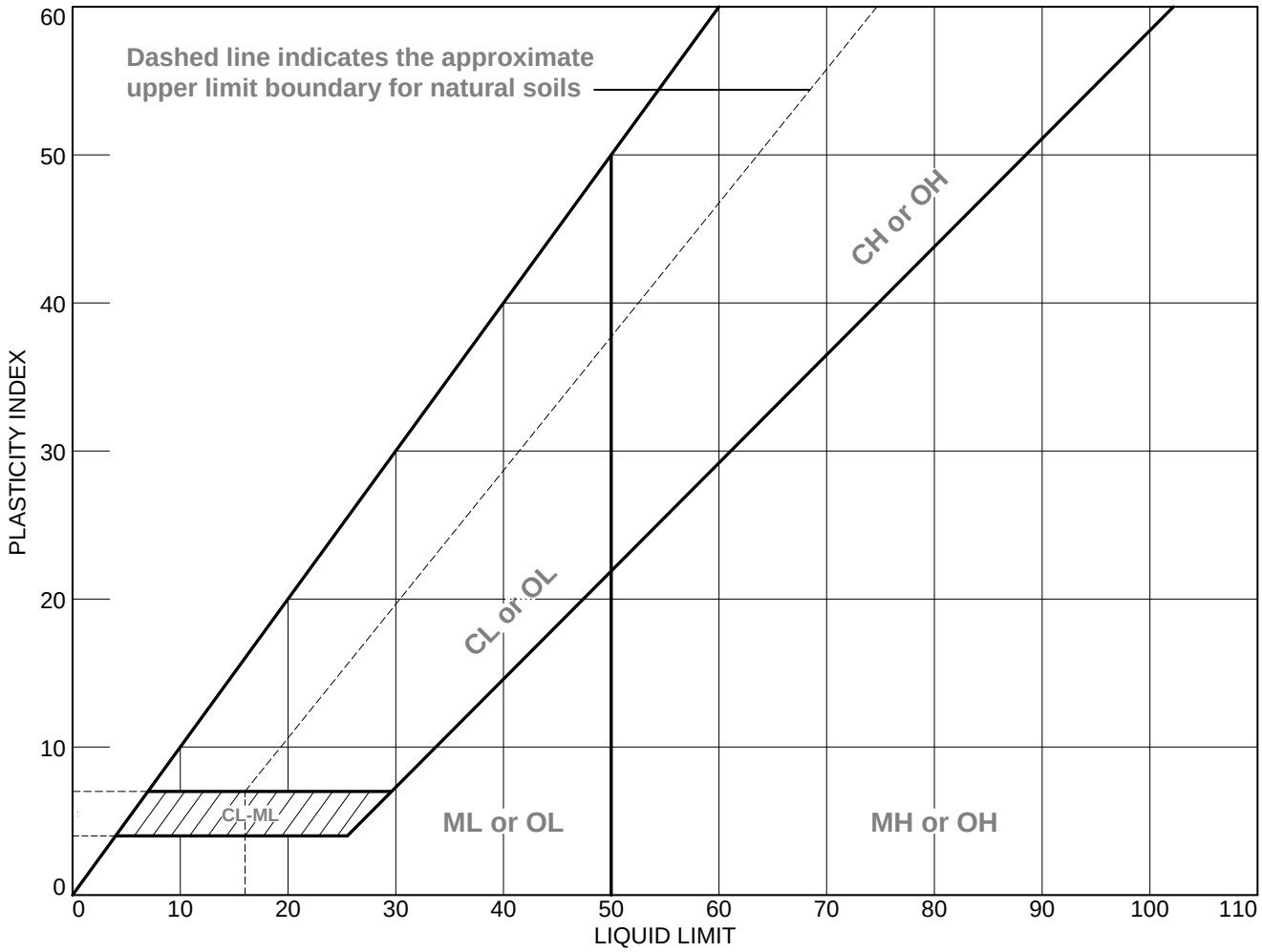
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-2	B-2	3'	42.1	NP	NV	NP	ML

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-3	B-3	2'	23.6	NP	NV	NP	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	9.8	3.6	10.9	49.0	26.7	

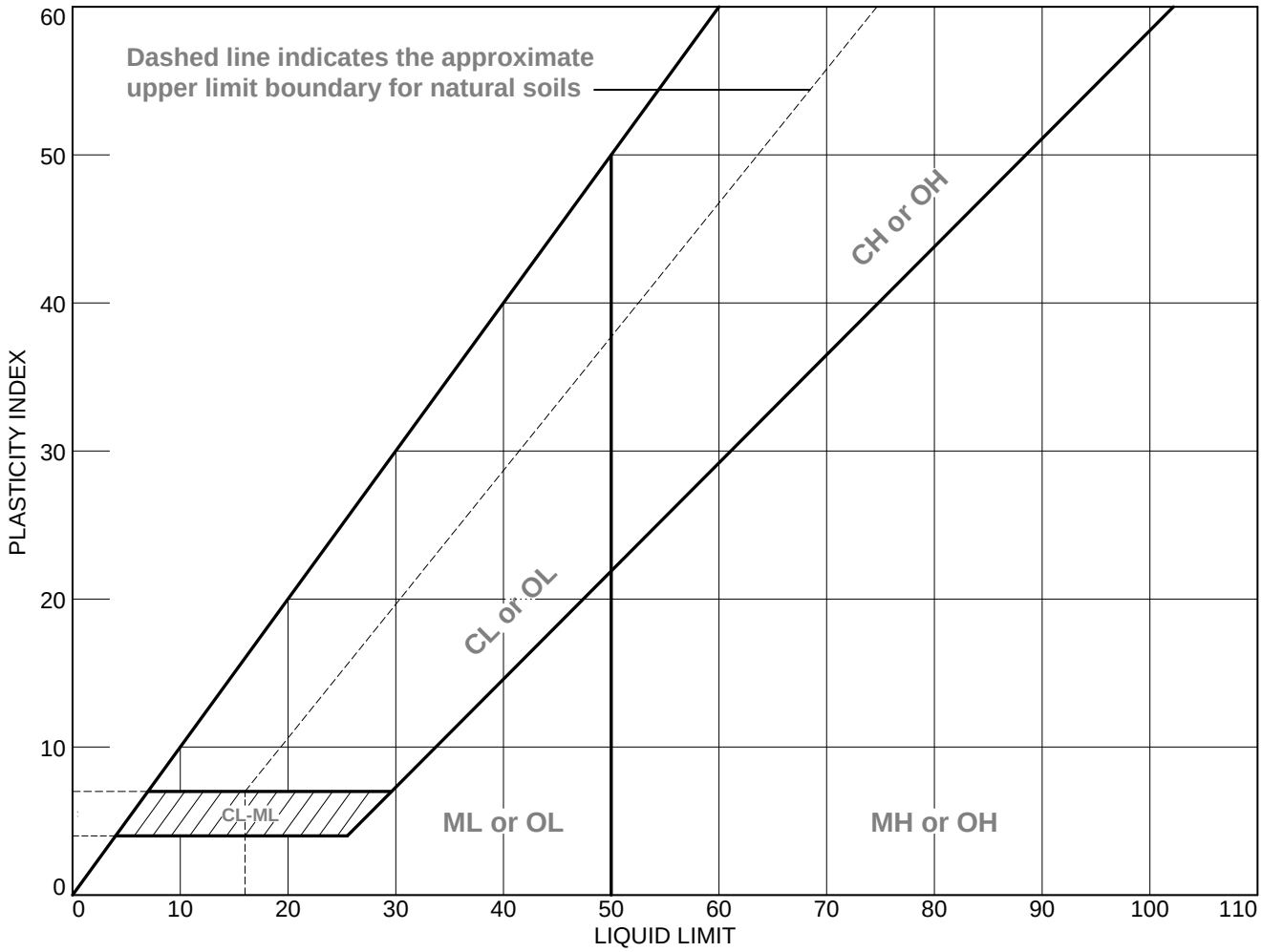
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-4	B-4	1'	Silty SAND	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk
Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



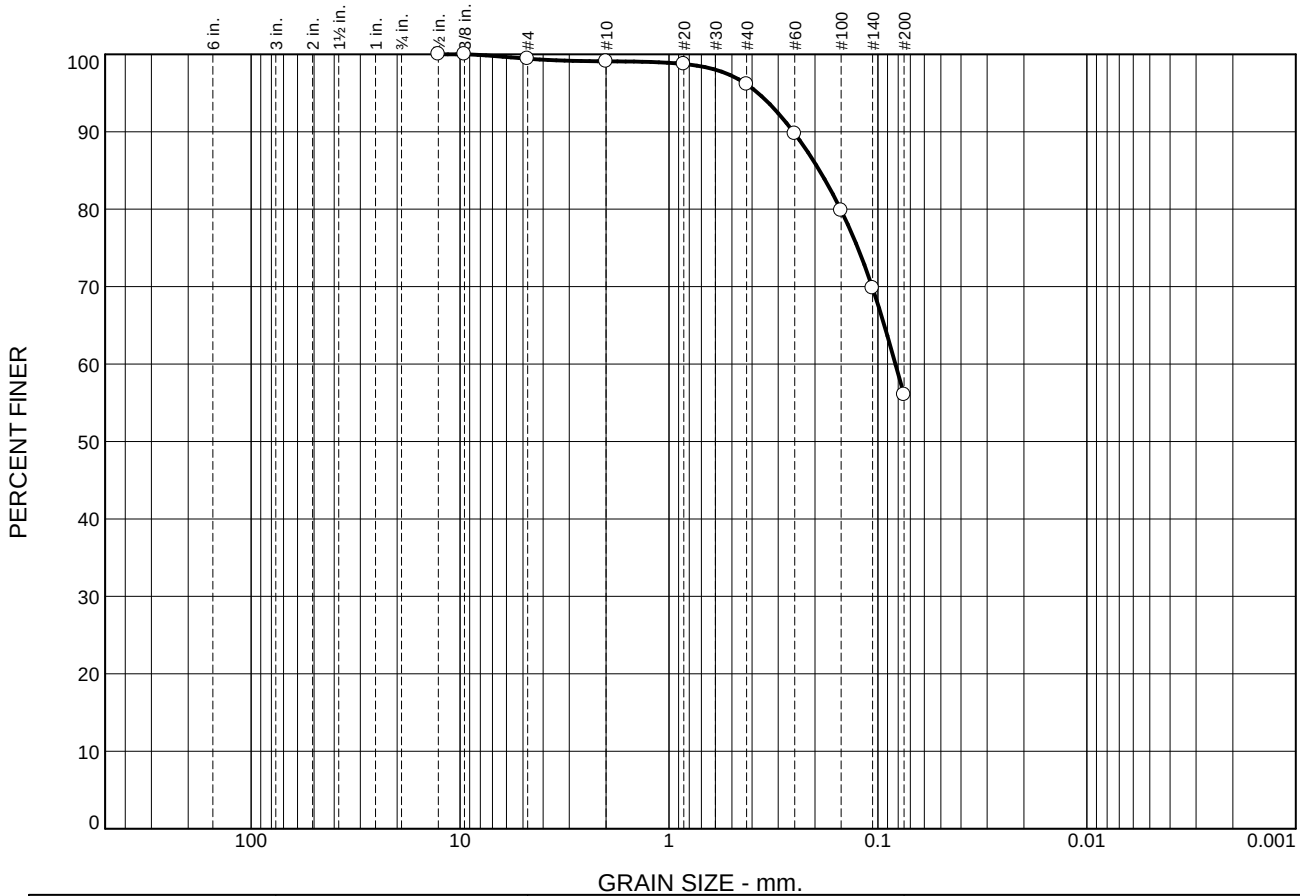
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-4	B-4	1'	16.4	NP	NV	NP	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	0.3	3.0	40.1	56.0	

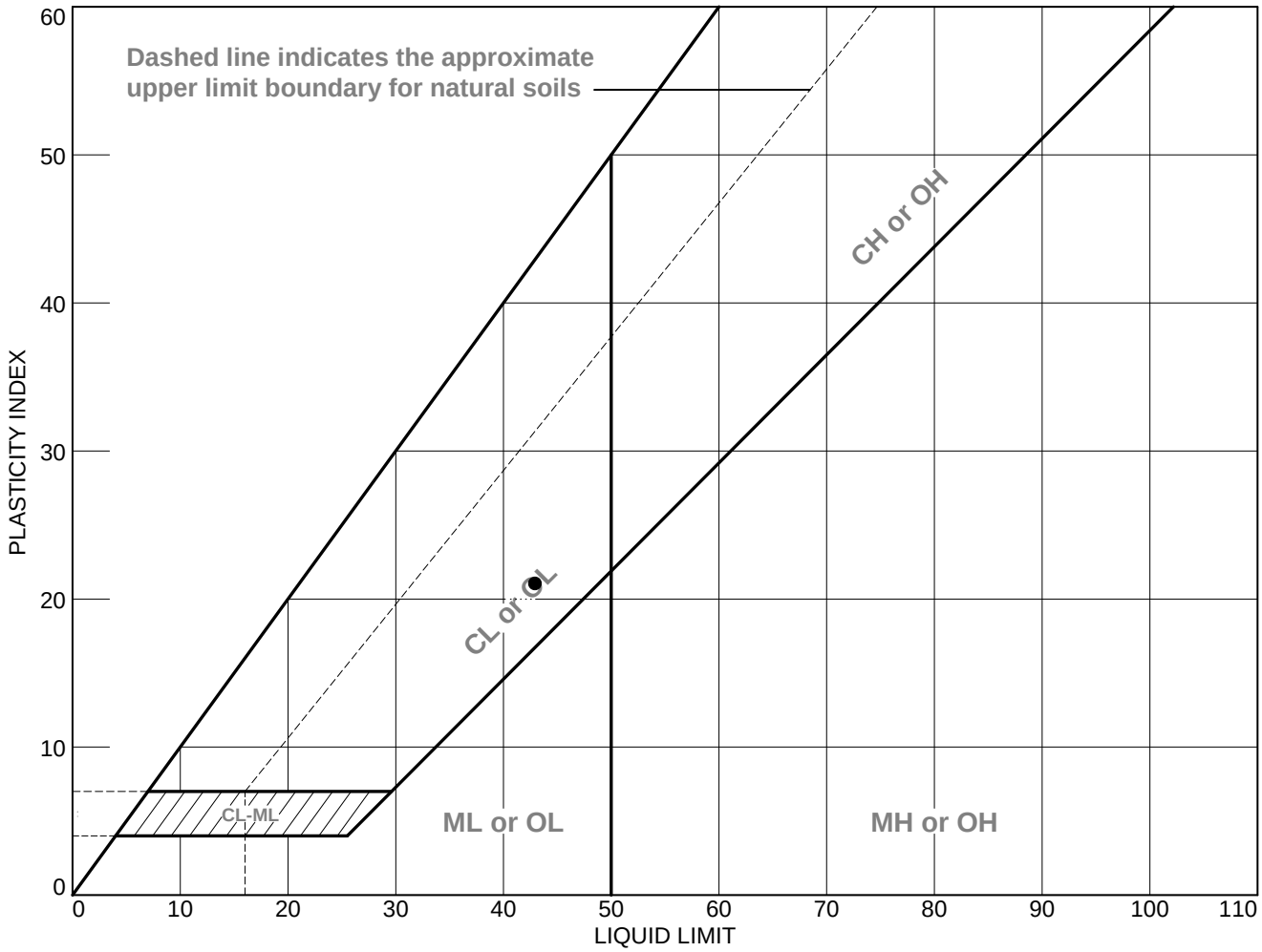
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-5	B-5	1'	Sandy SILT	ML

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk
Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-5	B-5	3'	22.2	22	43	21	CL

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.4	0.8	14.3	56.4	28.1	

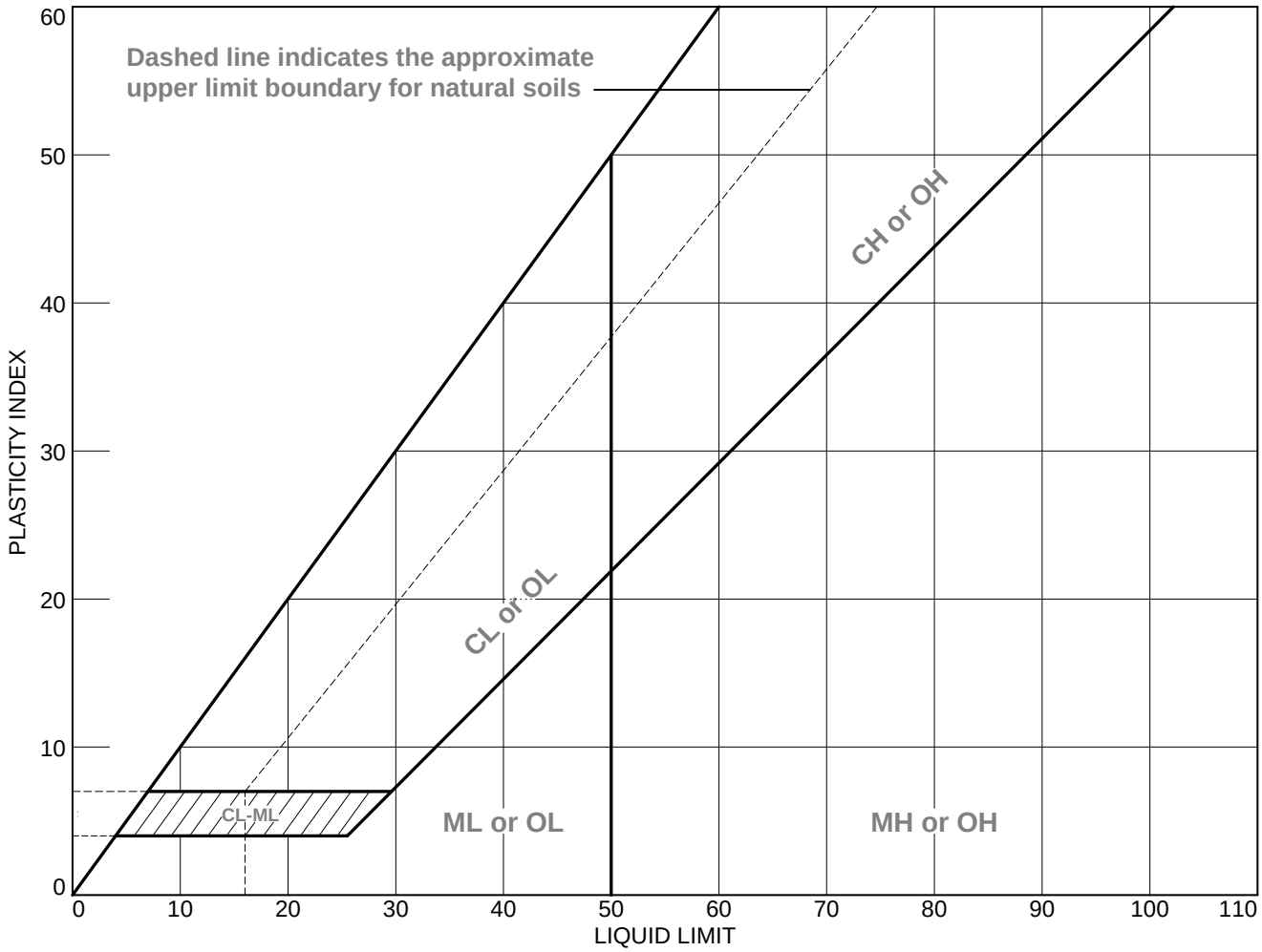
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-6	B-6	7'	Silty SAND	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk
Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



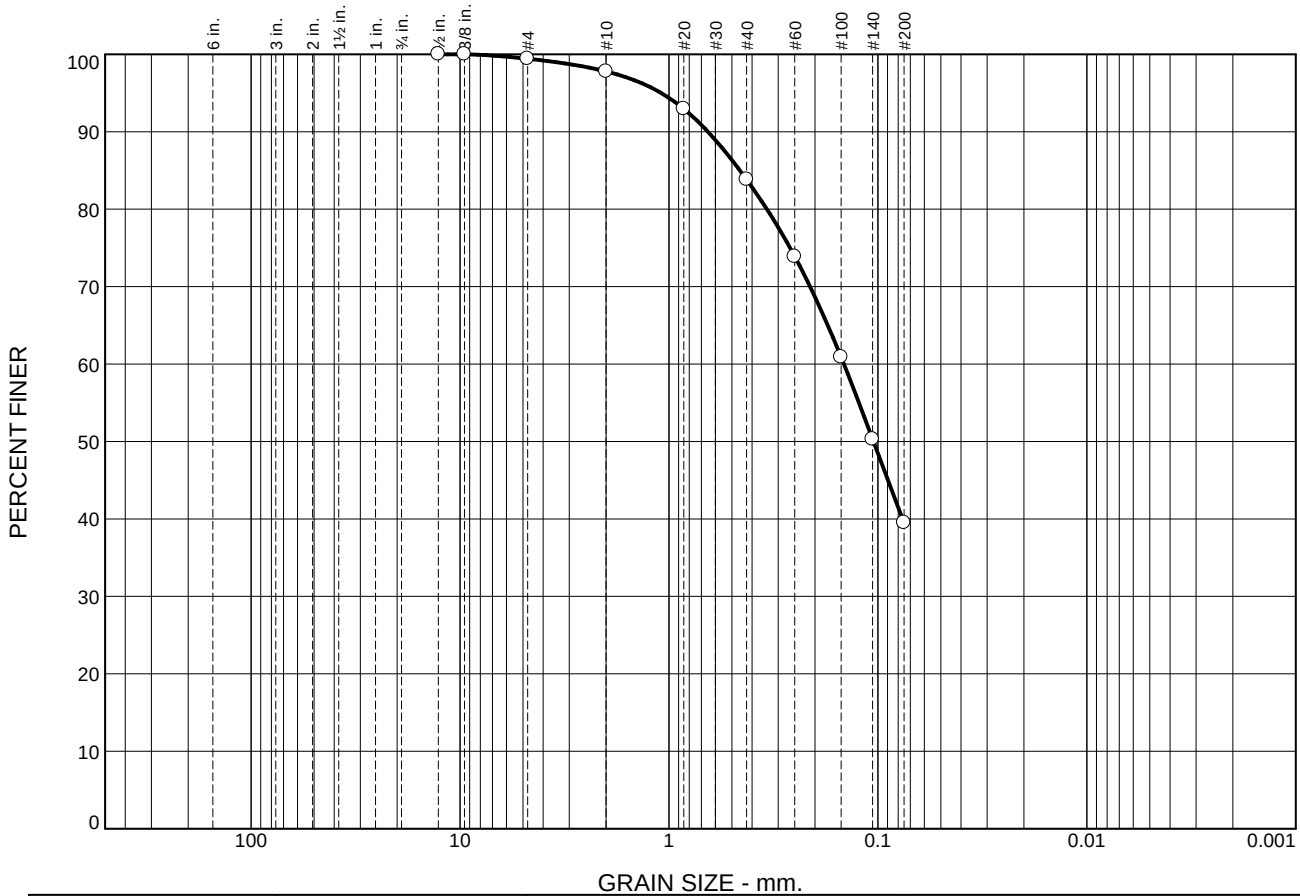
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-6	B-6	7'	41.3	NP	NV	NP	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	1.6	14.0	44.3	39.5	

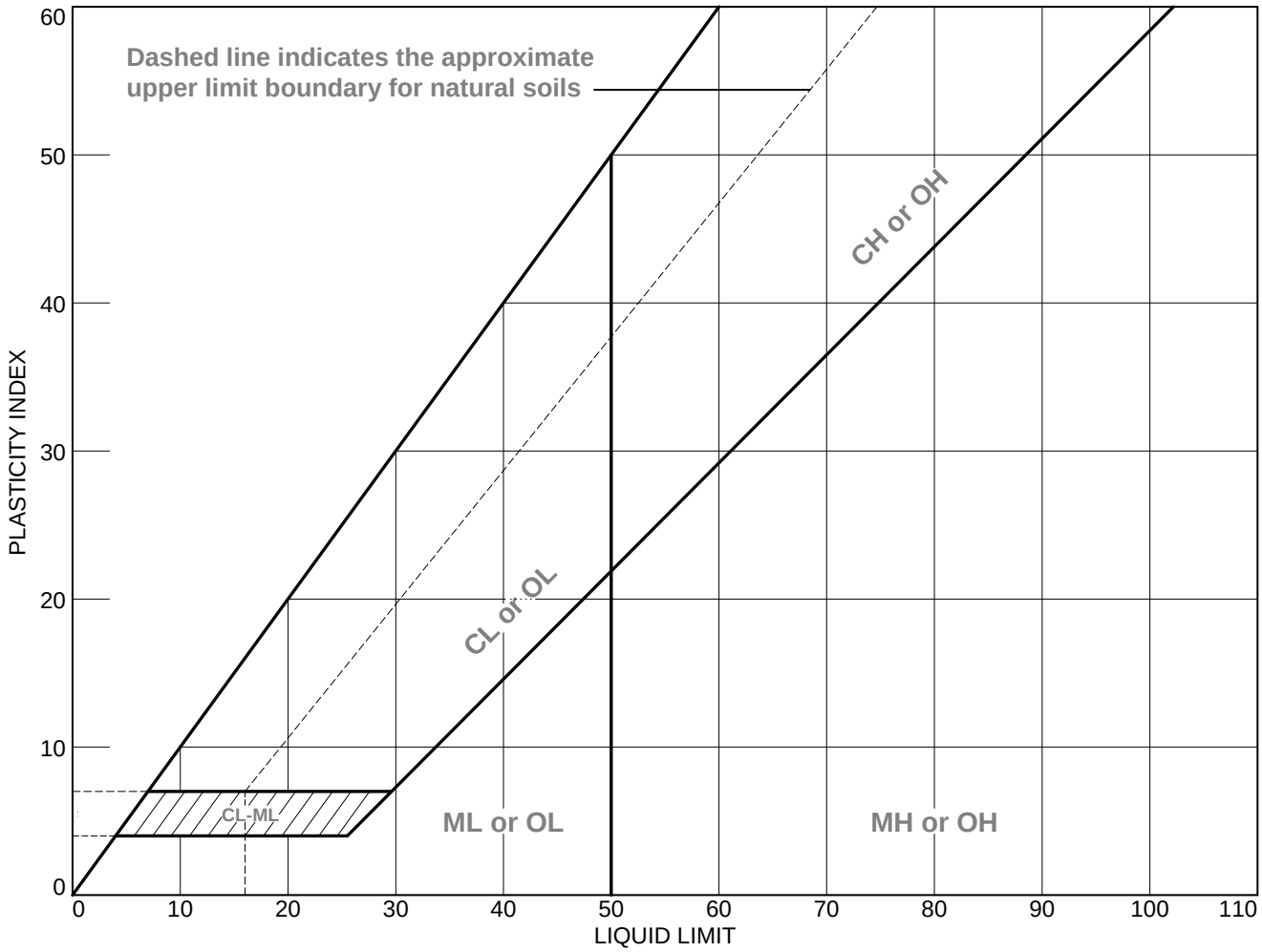
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B-7	B-7	5'	Silty SAND	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk
Project No.: 2024018 **Figure**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B-7	B-7	6'	36.2	NP	NV	NP	SM

Nova Engineering & Environmental
Norcross, GA

Client: City of Dunwoody
Project: Dunwoody Nature Center Boardwalk

Project No.: 2024018 **Figure**

APPENDIX D
Qualifications of Recommendations

QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our on-site services and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the exploration and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to document that the conditions anticipated in this exploration actually exist, and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of CLIENT only. The scope of services performed during this exploration was developed for purposes specifically intended by CLIENT and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of Georgia. This warranty is in lieu of all other statements or warranties, either expressed or implied.

Important Information about This

Geotechnical-Engineering Report

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

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

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

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

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

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

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

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

This Report's Recommendations Are Confirmation-Dependent

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

This Report Could Be Misinterpreted

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

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

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

Give Constructors a Complete Report and Guidance

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

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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