CGC, Inc.
Construction • Geotechnical
Consulting Engineering/Testing

July 13, 2022
C22295

Re: Preliminary Geotechnical Exploration Report
Proposed Springs Wood Development
4917 East Clayton Road
Fitchburg, Wisconsin

Dear Mr. Woods:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the preliminary subsurface exploration program for the above-referenced project. The purpose of this exploration program was to characterize the subsurface conditions within the southern portion of the site and to discuss the findings regarding general site preparation and preliminary foundation and stormwater infiltration design/construction. An electronic copy of this report is provided for your use, and we can mail a paper copy upon request. We are also sending electronic copies of this report to project team members EOR, Knothe and Bruce, and Madison Property Management.

PROJECT DESCRIPTION AND SITE CONDITIONS

We understand that the project site, located southeast of the intersection of Clayton Road and County Highway MM in Fitchburg, Wisconsin, is being considered for future development. The provided preliminary site layout indicates that development may ultimately include up to five multi-story residential buildings, each with an underground parking level. Surface parking and drive lanes, stormwater management, as well as outdoor amenity spaces are also planned. While the focus of this preliminary study was on the southern portion of the development, the entire preliminary site playout is depicted on the Soil Boring Location Exhibit in Appendix B.

The northern approximately half of the site is mantled with lawn and two residential structures are present along Clayton Road. The southern half of the site is heavily wooded. Based on topographical site information viewed via the Dane County DCiMap, existing grades slope up fairly steeply from south to north, between approximately EL 868 ft and 985 ft. The steepest site grades are generally present within the southern wooded area. Although final site and building grades were not available, based on existing topography, we envision that a fairly significant earthwork operation will be required to facilitate development.

SUBSURFACE CONDITIONS

Subsurface conditions for this study were explored by drilling two (2) Standard Penetration Test (SPT) soil borings to planned depths of 25 ft below current site grades at locations selected by the project

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team and located in the field by CGC. Ground surface elevations at each location were survey by CGC personnel after completion of the borings. The borings were conducted by Soil Essentials, Ltd. (under subcontract to CGC) on June 16, 2022 using a track-mounted rotary drill rig equipped with hollow stem augers and an automatic SPT hammer. The specific procedures used for drilling and sampling are described in Appendix A, and the boring locations are shown in plan on the Soil Boring Location Exhibit presented in Appendix B.

The subsurface profiles at the boring locations were generally similar and a generalized profile can be described by the following strata, in descending order:

- About 5 to 8 in. of ***topsoil***; followed by
- Very loose to dense ***sand strata*** with varying silt and gravel contents, as well as scattered cobbles and boulders to the maximum depths explored.

Groundwater was not encountered within the limits of the borings during or shortly after drilling. Water levels should be expected to fluctuate based on seasonal variations in precipitation, infiltration, evapotranspiration and other factors. A more detailed description of the site soil and groundwater conditions is presented on the soil boring logs contained in Appendix A.

DISCUSSION AND PRELIMINARY DESIGN CONSIDERATIONS

Subject to the limitations discussed below and based on the limited subsurface exploration program, it is our opinion that this site is generally suitable for development and construction. However, depending on final building grades and locations, and based on the findings in the soil borings, some undercutting and/or stabilization of moisture-sensitive siltier sand and clay soils may be required during site development and foundation construction. Further, some stormwater infiltration potential appeared to generally be feasible for systems extending into the granular soils on this portion of the site.

When final building details and finished site elevations have been determined, a supplemental subsurface exploration program involving test pits and/or additional borings is recommended to further characterize the subsurface conditions on this site and to develop more specific building and site design recommendations. A general overview of preliminary site preparation, foundation design and stormwater infiltration potential recommendations for the southern portion of the site are provided below. Note that revision of the preliminary recommendations contained herein may be warranted upon completion of supplemental explorations and as design planning progresses.

General Site Preparation

Following tree removal and site stripping, we generally anticipate that sand soils will be exposed in the vicinity of the borings. However, based on experience in the project vicinity, natural clay soils should also be expected in portions of the site. The on-site siltier sand and possibly clay soils are considered moisture-sensitive and can become easily disturbed by repetitive construction traffic during periods of wet weather. Therefore, the on-site soils may require undercutting/stabilization with coarse aggregate in order to develop stable conditions prior to fill placement (if required) and/or for pavement, slab and foundation support.

To the extent practical, we recommend that structural fill (if required), as well as fill within the upper 2 to 3 ft in pavement areas, consist of granular (sand) soils. The on-site granular soils, are generally considered suitable for re-use as fill/backfill provided they are selectively stockpiled and separated from clay/silt soils. However, these soils typically contain significant portions of silt and can be sensitive to an increase in moisture content, which may result in difficulty achieving adequate levels of compaction, particularly during periods of wet weather. Therefore, some moisture conditioning may be required. Clay/silt soils, if encountered and stockpiled on-site, are better suited to be used as fill outside of building areas within green space or in lower sections of pavement areas.

Preliminary Foundation Design

Depending on final building locations and elevations, foundations are expected to bear within medium dense to dense natural sand soils, or newly-placed engineered fill placed during site development (if required). Though not encountered in the borings, natural clay soils may also be present below foundations. Isolated undercutting of loose natural sand or softer natural clay soils may potentially be required, if encountered at/below foundation elevations. The amount (depth and extent) of undercutting required will depend on final layout and design elevations, as well as the design soil bearing pressure.

Based on the soil borings, a soil bearing pressure on the order of 3,000 to 4,000 psf may be feasible for foundations bearing within the near-surface granular strata, assuming softer clay or very loose sand soils are undercut, as needed. A higher bearing pressure on the order of 5,000 psf could be utilized if foundations extend deeper into the medium dense to dense sand soils. As noted, *we recommend that additional soil borings be completed following further development of building details and proposed finished site grades, to better characterize the subsurface conditions on the site and provide more specific foundation design recommendations.*

Preliminary Stormwater Infiltration Potential

We understand that stormwater management areas will be included in the site design. The subsurface profile (below topsoil) consists of coarser-grained *sand*, *loamy sand* and *sandy loam* soils. According to Table 2 in WDNR Conservations Practice Standard 1002 (*Site Evaluation for Stormwater Infiltration*), these soils are assigned estimated infiltration rates of between 0.5 to 3.6 in./hr.

It is our opinion that some stormwater infiltration will be possible if the infiltration system extends into the sandy soils encountered below the topsoil at the borings. Note that per WDNR 1002, the design infiltration rate is based upon the least permeable layer within 5 ft of the bottom of the stormwater system. Therefore, the design infiltration rate at this site will depend on the bottom of the stormwater management device. Due to revision of WDNR Technical Standard 1002, following final site design, supplemental test pits are recommended within the planned stormwater areas in order to develop design infiltration rates.

FOLLOW-UP EXPLORATION PROGRAM

The exploration program described in this report is preliminary in nature and is not intended to provide sufficient detail on subsurface conditions for foundation and/or site design for the proposed development. A follow-up exploration program with additional soil borings is recommended to provide specific geotechnical recommendations for the building and site/pavement, with supplemental test pits for the stormwater management areas, when details of the proposed development become available. We can provide specific recommendations and a proposal for the additional geotechnical work at the appropriate time, if desired.

*****

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Alex J. Bina, P.E., CST
Consulting Professional

Ryan J. Portman, P.E., CST
Consulting Professional

Encl: Appendix A - Field Exploration
Appendix B - Boring Location Exhibit
Logs of Test Borings (2)
Log of Soil Boring-General Notes
Unified Soil Classification System
Appendix C - Document Qualifications

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Subsurface conditions for this study were explored by drilling two (2) Standard Penetration Test (SPT) soil borings to depths of 25 ft below current site grades, which were sampled at 2.5-ft intervals to a depth of 10 ft and at 5-ft intervals thereafter. The samples were obtained in general accordance with specifications for standard penetration testing, ASTM D 1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures between Samples

   The boring is extended downward, between samples, by a hollow-stem auger.

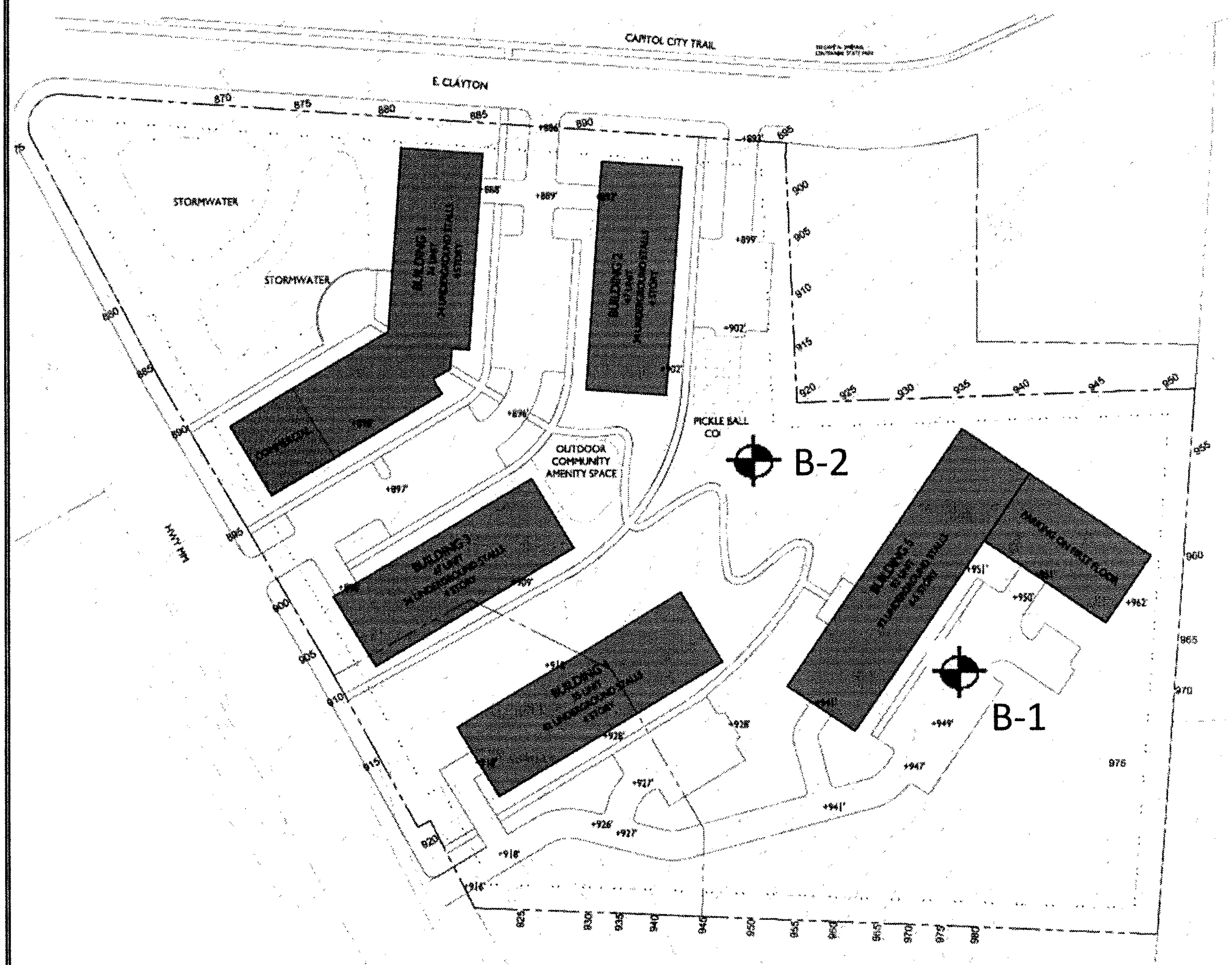
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D 1586)

   This method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance.

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the soil samples for possible environmental contaminants was not conducted by the driller as these services were not part of CGC's work scope.* Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite to satisfy WDNR regulations, and the soil samples were delivered to our laboratory for visual classification and limited geotechnical laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System (USCS).

APPENDIX B

BORING LOCATION EXHIBIT
LOGS OF TEST BORINGS (2)
LOG OF SOIL BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

⯁ Denotes Boring Location

N

Notes:

1. Base map prepared by DKA.
2. Locations are approximate.
3. Soil borings performed by Soil Essentials June 2022.

Scale: Reduced

Job No. C22295	**CGC, Inc.**	**BORING LOCATION EXHIBIT** **Planned Development** **4917 E Clayton Road** **Fitchburg, WI**
Date: 6/2022		

Legend

⌖ Denotes Boring Location

N

Scale: Reduced

Notes:

1. Base map from DCI Map.
2. Locations are approximate.
3. Soil borings performed by Soil Essentials June 2022.

Job No. C22295	CGC, Inc.	BORING LOCATION EXHIBIT Planned Development 4917 E Clayton Road Fitchburg, WI
Date: 6/2022		

CGC Inc.

LOG OF TEST BORING

Project: Proposed Redevelopment, 4917 E Clayton Road
Location: Fitchburg, WI

Boring No. **B-1**
Surface Elevation (ft) 959.9
Job No. C22295
Sheet 1 of 1

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SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
						5± in. TOPSOIL					
1		17	M	3		Very Loose to Medium Dense, Brown Fine to Medium SAND, Trace to Little Silt, Trace to Some Gravel (SP/SP-SM)					
2		16	M	12	5						
3		17	M	19		Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
4		16	M	22	10						
5		15	M	21	15	Medium Dense to Dense, Brown Fine to Medium SAND, Trace Silt, Some Gravel (SP)					
6		16	M	39	20						
7		16	M	24	25	Medium Dense, Brown Fine SAND, Some Silt, Trace Gravel (SM)					
					30	End of Boring at 25 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling: NW
Upon Completion of Drilling: NW
Time After Drilling:
Depth to Water:
Depth to Cave in: 17.2'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 6/16/22 End 6/16/22
Driller SE Chief CRJ Rig Geoprobe 7822Dt
Logger Nick Editor ELC
Drill Method 2.25" HSA; Autohammer

LOG OF TEST BORING

CGC Inc.

Project: Proposed Redevelopment, 4917 E Clayton Road
Location: Fitchburg, WI

Boring No. B-2
Surface Elevation (ft) 931.7
Job No. C22295
Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LOI
						8± in. TOPSOIL					
1		16	M	4		Loose, Brown Fine to Medium SAND, Little to Some Silt, Some Gravel (SP-SM/SM)					
2		15	M	6	5	Loose to Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
3		17	M	17							
4		16	M	25	10						
5		17	M	26	15						
6		16	M	24	20	Medium Dense to Dense, Brown Fine SAND, Some Silt, Trace Gravel (SM)					
7		17	M	49	25						
					30	End of Boring at 25 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling ⊻ NW   Upon Completion of Drilling NW
Time After Drilling
Depth to Water ▼
Depth to Cave in 16.6'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

GENERAL NOTES

Start 6/16/22 End 6/16/22
Driller SE Chief CRJ Rig Geoprobe 7822Dt
Logger Nick Editor ELC
Drill Method 2.25" HSA; Autohammer

CGC, Inc.

LOG OF TEST BORING

General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse	¾" to 3"	¾" to 3"
Fine	4.76 mm to ¾"	#4 to ¾"
Sand: Coarse	2.00 mm to 4.76 mm	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm	#200 to #40
Silt	0.005 mm to 0.074 mm	Smaller than #200
Clay	Smaller than 0.005 mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
  Color, moisture, grain shape, fineness, etc.
Major Constituents
  Clay, silt, sand, gravel
Structure
  Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
  Glacial, alluvial, eolian, residual, etc.

Relative Density

Term	"N" Value
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace	0% - 5%
Little	5% - 12%
Some	12% - 35%
And	35% - 50%

Consistency

Term	q_u-tons/sq. ft
Very Soft	0.0 to 0.25
Soft	0.25 to 0.50
Medium	0.50 to 1.0
Stiff	1.0 to 2.0
Very Stiff	2.0 to 4.0
Hard	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic	Less than 4%
Organic Silt/Clay	4 – 12%
Sedimentary Peat	12% - 50%
Fibrous and Woody Peat	More than 50%

Plasticity

Term	Plastic Index
None to Slight	0 - 4
Slight	5 - 7
Medium	8 - 22
High to Very High	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

CS – Continuous Sampling
RC – Rock Coring: Size AW, BW, NW, 2"W
RQD – Rock Quality Designation
RB – Rock Bit/Roller Bit
FT – Fish Tail
DC – Drove Casing
C – Casing: Size 2 ½", NW, 4", HW
CW – Clear Water
DM – Drilling Mud
HSA – Hollow Stem Auger
FA – Flight Auger
HA – Hand Auger
COA – Clean-Out Auger
SS - 2" Dia. Split-Barrel Sample
2ST – 2" Dia. Thin-Walled Tube Sample
3ST – 3" Dia. Thin-Walled Tube Sample
PT – 3" Dia. Piston Tube Sample
AS – Auger Sample
WS – Wash Sample
PTS – Peat Sample
PS – Pitcher Sample
NR – No Recovery
S – Sounding
PMT – Borehole Pressuremeter Test
VS – Vane Shear Test
WPT – Water Pressure Test

Laboratory Tests

q_a – Penetrometer Reading, tons/sq ft
q_a – Unconfined Strength, tons/sq ft
W – Moisture Content, %
LL – Liquid Limit, %
PL – Plastic Limit, %
SL – Shrinkage Limit, %
LI – Loss on Ignition
D – Dry Unit Weight, lbs/cu ft
pH – Measure of Soil Alkalinity or Acidity
FS – Free Swell, %

Water Level Measurement

▽- Water Level at Time Shown
NW – No Water Encountered
WD – While Drilling
BCR – Before Casing Removal
ACR – After Casing Removal
CW – Cave and Wet
CM – Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)		
	Clean Gravels (Less than 5% fines)	
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
	Clean Sands (Less than 5% fines)	
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

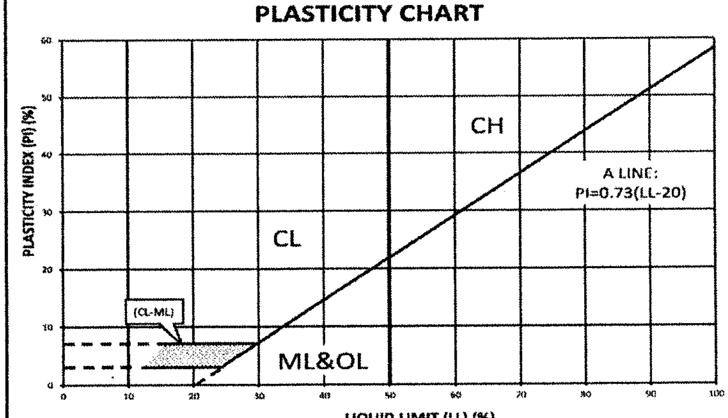
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limts below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limts above "A" line or P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent .... GW, GP, SW, SP
More than 12 percent .... GM, GC, SM, SC
5 to 12 percent .... Borderline cases requiring dual symbols

PLASTICITY CHART



APPENDIX C

DOCUMENT QUALIFICATIONS

APPENDIX C
DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR 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.

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 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. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *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 OPINION

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 judgement 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 over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront 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. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical 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 CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors 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 constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors 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 constructors 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 engineer's 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.

ENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental 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, many 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 GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

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