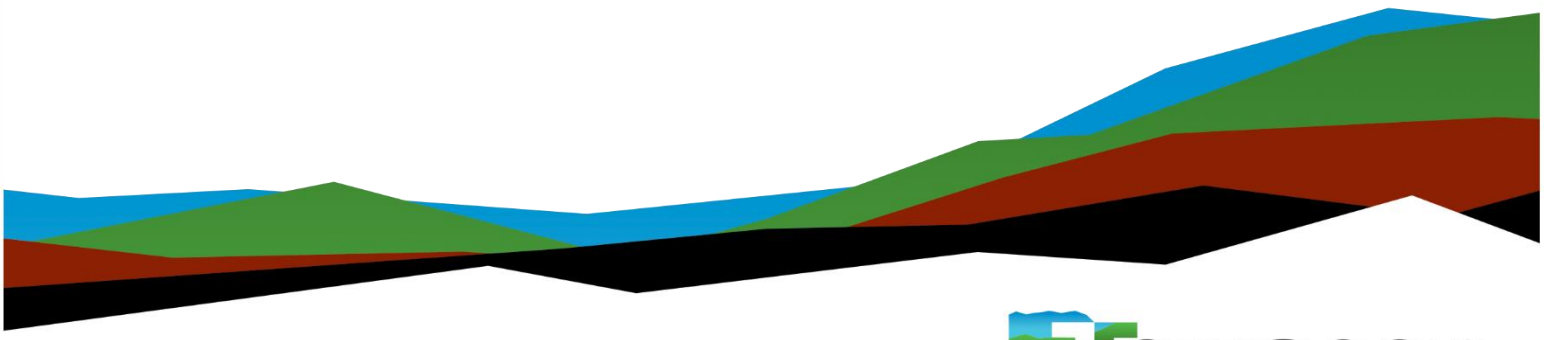
H&E Lee’s Summit

Geotechnical Engineering Report

April 17, 2024 | Terracon Project No. 02245079

Prepared for:

H&E Equipment Services
Baton Rouge, LA 70809



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April 17, 2024

H&E Equipment Services
7500 Pecue Lane
Baton Rouge, LA 70809

Attn: Marty Emigh
P: (704) 622-2105
E: memigh@he-equipment.com

Re: Geotechnical Engineering Report
H&E Lee's Summit
1100 SE Hamblen Road
Lee's Summit, Missouri
Terracon Project No. 02245079

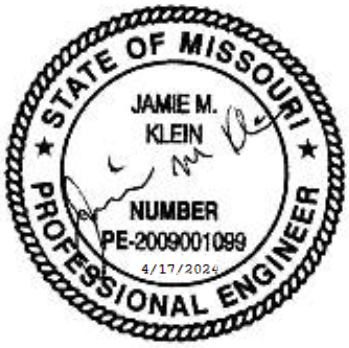
Dear Mr. Emigh:

We have completed a subsurface exploration and geotechnical engineering evaluation for the referenced project in general accordance with Terracon Proposal No. P02245079 dated March 18, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning aggregate pavements for the project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon



David Gudino-Chausse, E.I.
Geotechnical Staff Engineer

Jamie M. Klein, P.E.
Senior Engineer
Missouri: PE 2009001099

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Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Project Description

Item	Description
Project Description	We understand that the site will be utilized as an industrial outside storage (IOS) lot for H&E Equipment. Terracon was asked to explore the site and provide opinions and recommendations regarding subgrade condition and possible subgrade/surface course improvements in order to meet City of Lee's Summit regulations for private drives.
Pavements	No information regarding anticipated vehicle types, axle loads, or traffic volumes was provided. We anticipate the pavements will be utilized primarily by loaded five-axle semi-truck trailers and construction equipment.

Terracon should be notified if any of the above information is inconsistent with the planned construction as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration.

Item	Description
Parcel Information	The project is located at 1100 SE Hamblen Road in Lee's Summit, Missouri. Approximate Latitude/Longitude: 38.8997, -94.3641 See **Site Location**
Current Site Conditions	The site is currently developed, with an existing single-story building and a large gravel lot behind the building being used as a storage area for semi-trailers and construction equipment.
Existing Topography	The site is relatively level with less than 2 feet of grade change.

Opinions and Recommendations

Based on the site conditions, laboratory test results, and our experience on similar sites, we have developed the following consensus regarding the existing gravel lot and

driveway. We understand the lot will be used to store heavy construction equipment for a construction equipment rental company.

The current site topography generally appears to allow water to sheet flow efficiently across the surface to the south end of the lot. No areas that pose a risk of allowing water ponding were identified during our site visit, if low lying areas develop or are identified at a later time, those areas should be regraded as soon as practical to promote rapid surface drainage away from the site. Proper grading of the site is crucial to allow water to be quickly removed following precipitation.

The existing aggregates present at the site were sampled and tested for gradation. The gradation tests confirmed the aggregate meets the gradation for MODOT Type 5 aggregate base which is typically recommended for use on gravel lots and drives. Based on our exploration and laboratory test results the subgrade material consists of variable plasticity clay soils which were medium stiff to stiff and had with relatively consistent moisture content values. No soft areas or areas of concern were observed or identified at the time of our exploration.

Based on the field and laboratory test results we estimated design parameters for the subgrade and gravel surfacing material which were then used to estimate the future capacity of the existing gravel pavements (in equivalent single axle load or ESALs) which are summarized in the following table.

Option	Maximum Traffic Loads (18 kip Equivalent Single Axle Load)
Utilize Existing Gravel Pavements (no additional aggregate)	Up to 100,000 ESALs
Increase Gravel Thickness	>100,000 ESALs
Consider Asphalt/Concrete Pavement	>100,000 ESALs

The following table provides some basic 18-kip ESAL equivalencies. This table should only be used as a guide. Anticipated lot usage should be evaluated by a civil engineer.

18-kip ESALs	Number of legally loaded semi tractor trailers per day over a 20-year design life	Number of empty semi tractor trailers per day over a 20-year design life
100,000	Up to 8	Up to 500

Note: The values provided above are the listed vehicle types and traffic volumes only. Most lots will experience a variety of traffic loads that may include a combination of loaded and empty semi-tractor trailers, forklifts, hostlers, and other vehicle types. The anticipated lot usage should be evaluated by a civil engineer to determine the actual number of ESALs based on the anticipated traffic.

Long term performance of the gravel-surfaced pavements will depend on several factors, including traffic loading and the effectiveness of surface drainage and the level of routine maintenance. The following recommendations should be considered:

- Grade the aggregate wearing surface to have a minimum 1/4 inch per foot slope to promote effective surface drainage as water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration.
- Seal off from any adjacent AC or PCC pavements and provide effective perimeter drainage to prevent moisture migration into the edges of the gravel pavements,
- Repair any potholes, depressions, or ruts that may develop as soon as possible,
- Plan to periodically re-grade and compact the aggregate,
- Add material as needed to maintain the minimum recommended thickness of the aggregate

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between boring locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is

solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, cost estimating, excavation support, and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Attachments

Exploration and Testing Procedures

Field Exploration

Number of Borings	Approximate Boring Depth (feet)	Location
7	5	Within the existing gravel lot

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal precision of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were obtained by interpolation from Google Earth.

Subsurface Exploration Procedures: We advanced the borings with an ATV-mounted rotary drill rig using continuous flight augers. Samples were obtained from the borings using split-barrel sampling procedures. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. The borings were backfilled with auger cuttings after their completion.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. Groundwater was not observed at these times.

Our exploration team prepared field boring logs to record the sampling depths, penetration distances, other sampling information, visual classifications of the materials observed during drilling, and our interpretation of the subsurface conditions between samples. The samples were placed in appropriate containers and taken to our laboratory for testing and classification. The final boring logs provided with this report include modifications based on the results of the laboratory tests and observations of the recovered samples.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following tests on selected samples:

- Moisture Content
- Atterberg Limits
- Aggregate gradation

The laboratory testing program included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in general accordance with the Unified Soil Classification System.

Site Location and Exploration Plans

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 through B-7)

Geomodel

Grain Size Distribution

Note: All attachments are one page unless noted above.

H&E Lee's Summit
1100 SE Hamblen Road | Lee's Summit, MO
Terracon Project No. 02245079

15620 W 113th St
Lenexa, KS

Boring Log No. B-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.9000° Longitude: -94.3652° Depth (Ft.) / Elevation: 1026 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**7" GRAVEL** 0.7 / 1025.3							
2		**LEAN CLAY (CL)**, gray brown, stiff			X	8	5-5-9 N=14	14.1	36-21-15
					X	10	5-6-7 N=13	18.0	
		5.0 / 1021 ***Boring Terminated at 5 Feet***	5						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).
See Supporting Information for explanation of symbols and abbreviations.
Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Notes

Advancement Method
Solid-stem CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Logged by
BH

Boring Started
03-26-2024

Boring Completed
03-26-2024

H&E Lee's Summit
1100 SE Hamblen Road | Lee's Summit, MO
Terracon Project No. 02245079

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Lenexa, KS

Boring Log No. B-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.9000° Longitude: -94.3648° Depth (Ft.) / Elevation: 1025 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**7" GRAVEL** 0.7 / 1024.3							
2		**LEAN CLAY (CL)**, light brown and gray, stiff to medium stiff				9	4-5-5 N=10	19.3	
						13	2-2-4 N=6	25.9	
		5.0 / 1020	5						
		Boring Terminated at 5 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Notes

Advancement Method
Solid-stem CFA

Logged by
BH

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Boring Started
03-26-2024

Boring Completed
03-26-2024

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Boring Log No. B-3

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.8996° Longitude: -94.3650° Depth (Ft.) — Elevation: 1023 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**7" GRAVEL** 0.7 — 1022.3							
2		**LEAN CLAY (CL)**, gray brown, stiff			X	6	4-4-4 N=8	18.4	
					X	10	3-4-5 N=9	20.0	
		5.0 — 1018	5						
		Boring Terminated at 5 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Logged by
BH

Boring Started
03-26-2024

Boring Completed
03-26-2024

Notes

Advancement Method
Solid-stem CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

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Boring Log No. B-4

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.8994° Longitude: -94.3652° Depth (Ft.) / Elevation: 1022 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**7" GRAVEL** 0.7 / 1021.3							
2		**LEAN CLAY (CL)**, light brown to brown, stiff to medium stiff							
					X	8	4-4-6 N=10	19.4	
					X	10	3-2-3 N=5	24.5	
		5.0 / 1017	5						
		Boring Terminated at 5 Feet							

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Notes

Advancement Method
Solid-stem CFA

Logged by
BH

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Boring Started
03-26-2024

Boring Completed
03-26-2024

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Terracon Project No. 02245079

15620 W 113th St
Lenexa, KS

Boring Log No. B-5

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.8994° Longitude: -94.3648° Depth (Ft.) / Elevation: 1022 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**6" GRAVEL** 0.5 / 1021.5							
2		**LEAN CLAY (CL)**, brown, stiff							
					X	6	3-5-8 N=13	13.2	39-22-17
					X	7	4-6-6 N=12	20.2	
		5.0 / 1017 ***Boring Terminated at 5 Feet***	5						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Logged by
BH

Notes

Advancement Method
Solid-stem CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Boring Started
03-26-2024

Boring Completed
03-26-2024

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Lenexa, KS

Boring Log No. B-6

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.8994° Longitude: -94.3644° Depth (Ft.) / Elevation: 1023 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**7" GRAVEL** 0.7 / 1022.3							
2		**LEAN CLAY (CL)**, brown, stiff				8	2-4-4 N=8	25.0	
						9	3-5-5 N=10	27.7	
		5.0 / 1018 ***Boring Terminated at 5 Feet***	5						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Notes

Advancement Method
Solid-stem CFA

Logged by
BH

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Boring Started
03-26-2024

Boring Completed
03-26-2024

H&E Lee's Summit
1100 SE Hamblen Road | Lee's Summit, MO
Terracon Project No. 02245079

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Lenexa, KS

Boring Log No. B-7

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 38.8994° Longitude: -94.3640° Depth (Ft.) / Elevation: 1023 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI
1		**7" GRAVEL** 0.7 / 1022.3							
2		**FAT CLAY (CH)**, gray brown, medium stiff to stiff				6	3-3-4 N=7	24.9	76-28-48
						10	3-3-6 N=9	28.0	
		5.0 / 1018 ***Boring Terminated at 5 Feet***	5						

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations obtained from Google Earth

Water Level Observations
Groundwater not encountered

Drill Rig
CME 550

Hammer Type
Automatic

Driller
CJ

Notes

Advancement Method
Solid-stem CFA

Abandonment Method
Boring backfilled with Auger Cuttings and/or Bentonite

Logged by
BH

Boring Started
03-26-2024

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03-26-2024

H&E Lee's Summit
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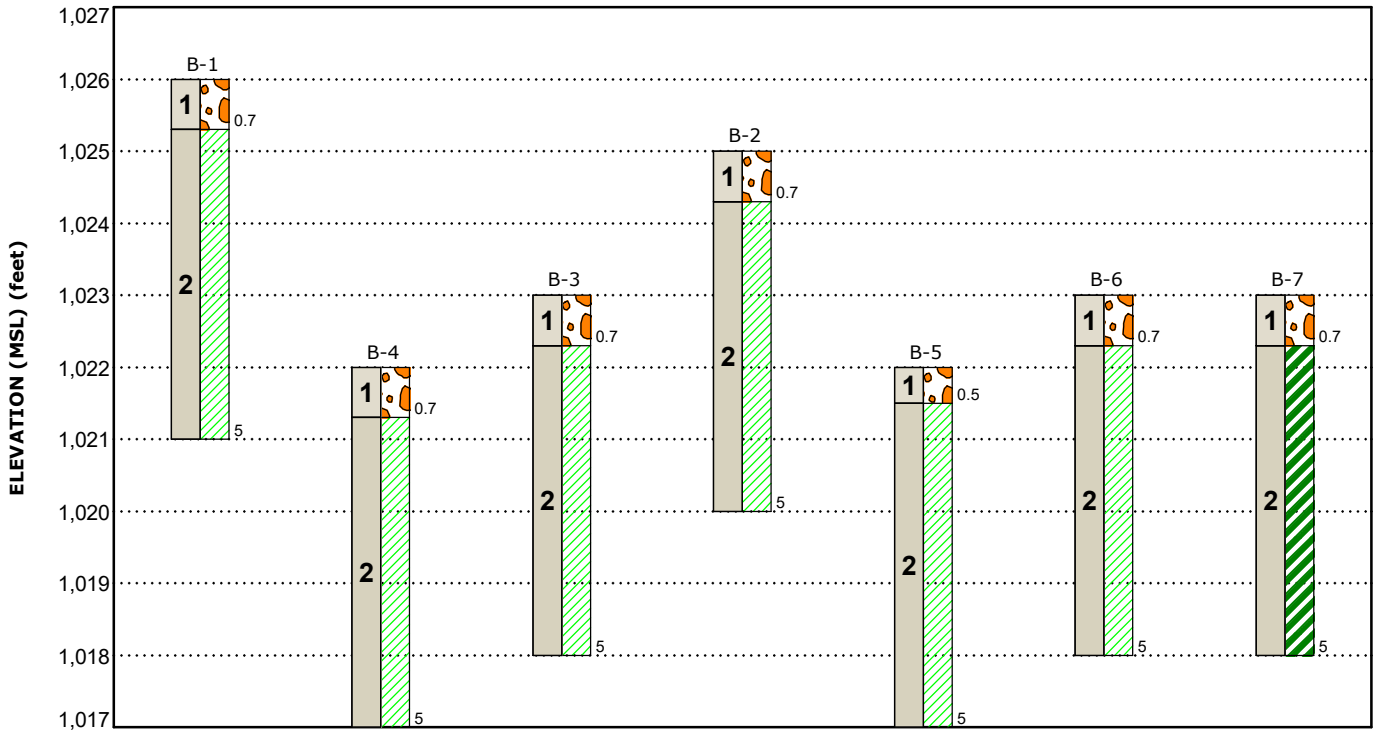
GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Surface Gravel	Graded gravel
2	Native Soils	Lean clay with some fat clays, medium stiff to stiff, gray brown

Legend

Poorly-graded Gravel
Lean Clay
Fat Clay

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

H&E Lee's Summit
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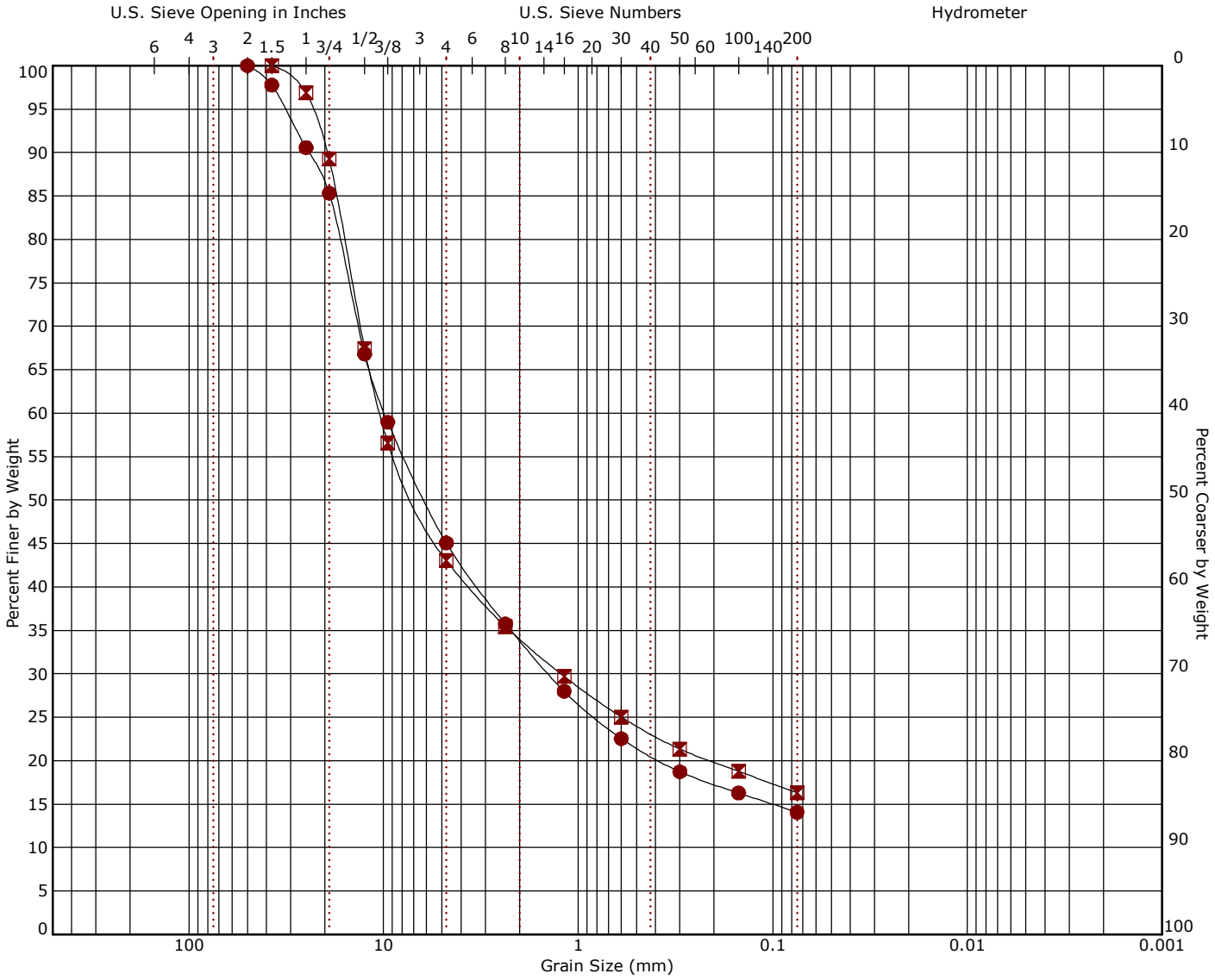
Grain Size Distribution

ASTM D422 / ASTM C136 / AASHTO T27



Cobbles	Gravel		Sand			Silt or Clay
	coarse	fine	coarse	medium	fine	

Boring ID	Depth (Ft)	Description		LL	PL	PI	Cc	Cu
Bag 1 - Grab	0							
Bag 2 - Grab	0							

Boring ID	Depth (Ft)	D_{100}	D_{60}	D_{30}	D_{10}	%Cobbles	%Gravel	%Sand	%Fines	%Silt	%Clay
Bag 1 - Grab	0	50	9.851	1.411		0.0	54.9	31.0	14.1		
Bag 2 - Grab	0	37.5	10.363	1.221		0.0	57.0	26.7	16.3		

Supporting Information

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

15620 W 113th St
Lenexa, KS

General Notes

Sampling

Water Level

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Cave In Encountered

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

Field Tests

N	Standard Penetration Test Resistance (Blows/Ft.)
(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
UC	Unconfined Compressive Strength
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)	Consistency	Unconfined Compressive Strength Qu (tsf)	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 4 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.