CMT TECHNICAL SERVICES

ENGINEERING •GEOTECHNICAL •ENVIRONMENTAL (ESA I & II) •
MATERIALS TESTING •SPECIAL INSPECTIONS •
ORGANIC CHEMISTRY • PAVEMENT
DESIGN •GEOLOGY

GEOTECHNICAL ENGINEERING STUDY

Proposed Utah Valley Sports Performance Project

About 880 North 200 West
Provo, Utah
CMT PROJECT NO. 105485

FOR:
Intermountain Health, Central Office
36 South State Street
Salt Lake City, Utah 84111

July 2, 2026

CMT TECHNICAL SERVICES

July 2, 2026

Mr. Jeremy King
Intermountain Health
Central Office
36 South State Street
Salt Lake City, Utah 84111

Subject: Geotechnical Engineering Study
Proposed Utah Valley Sports Performance Project
Utah Valley Hospital Campus
About 880 North 200 West
Provo, Utah
CMT Project No. 105485

Mr. King:

CMT Technical Services (CMT) submits herewith this geotechnical engineering study report for the subject site. This report contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. It also contains recommendations to aid in the design and construction of the earth related phases of this project.

On May 22, May 27, May 28, and June 1, 2026, a CMT staff professional was on-site and observed the drilling of 13 bore holes extending to depths of about 6 to 51.5 feet below the existing ground surface. Soil samples were obtained during the field operations and subsequently transported to our laboratory for further testing and observation.

Conventional isolated and/or continuous footings may be utilized to support the proposed structure, provided the recommendations in this report are followed. This report presents detailed discussions of design and construction criteria for this site.

We appreciate the opportunity to work with you at this stage of the project. CMT offers a full range of Geotechnical Engineering, Geological, Material Testing, Special Inspection services, and Phase I and II Environmental Site Assessments. With offices throughout Utah, Idaho, Arizona, Colorado and Texas, our staff is capable of efficiently serving your project needs. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-590-0394.

Sincerely,
CMT Technical Services

11309449-2202
MATTHEW
CLARK
KRAMER
7/2/26

Matt Kramer, P.E.
Geotechnical Engineer

Reviewed by:

William G. Turner, P.E., M. ASCE
Senior Geotechnical Engineer

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

CMT Technical Services (CMT) was retained to conduct a geotechnical subsurface study for the proposed Utah Valley Sports Performance Project. The site is situated on the west side of 200 West (Freedom Boulevard) at about 880 North in Provo, Utah, as shown in **Exhibit 1 - Vicinity Map** below.

EXHIBIT 1 – VICINITY MAP

1.2 Objectives, Scope and Authorization

The objectives and scope of our study were planned in discussions between Mr. Jeremy King of Intermountain Health, and Mr. Andrew Harris of CMT. In general, the objectives of this study were to define and evaluate the subsurface soil and groundwater conditions at the site, and provide appropriate foundation, earthwork, pavement and seismic recommendations to be utilized in the design and construction of the proposed development.

In accomplishing these objectives, our scope of work has included performing field exploration, which consisted of the drilling/logging/sampling of 13 bore holes, performing laboratory testing on representative samples of the subsurface soils collected in the bore holes, and conducting an office program, which consisted of correlating available data, performing engineering analyses, and preparing this summary report. This scope of work was authorized by returning a signed copy of our proposal dated April 21, 2026, and executed on May 15, 2026.

1.3 Description of Proposed Construction

We understand that construction of an orthopedic and sports medicine center with an area of about 109,000 square feet is planned for the site. We anticipate that the structure will likely be 2 levels above grade, constructed using steel post/beam, reinforced concrete, and/or reinforced masonry construction techniques, and founded on spread footings with slab on grade floors established at or near existing site grade. Maximum continuous wall and column loads are anticipated to be 10 kips per lineal foot and 250 kips, respectively. The project also includes sitework/improvements associated with the new facility. If the loading conditions are different than we have projected, please notify us so that any appropriate modifications to our conclusions and recommendations contained herein can be made.

We also understand that pavements at the site will include light-duty parking areas and internal drive lanes, which we anticipate will utilize asphalt pavement. Traffic is projected to consist of mostly automobiles and light trucks, a few daily medium-weight delivery trucks, a weekly garbage truck, and an occasional fire truck.

Site development will require some earthwork in the form of minor cutting and filling. A site grading plan was not available at the time of this report, but we project that maximum cuts and fills may be on the order of 3 to 4 feet. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

1.4 Executive Summary

The most significant geotechnical aspects regarding site development include the following:

1. Approximately 1 to 7 feet of undocumented fill blankets a majority of the site, with about 12 inches of topsoil and 3 inches of asphalt in some areas; foundations should not be placed on undocumented fill.
2. Subsurface soils encountered below the undocumented fill/asphalt/topsoil predominately consisted of GRAVEL (GC, GP-GC), CLAY (CL) and SAND (SM, SC, SP-SC) soils extending to the maximum depth explored of 51.5 feet below the existing ground surface.
3. Groundwater was encountered and subsequently measured at depths of 10 to 11.5 feet, which will not likely affect planned excavations and construction.
4. Liquefaction, including lateral spreading, will likely occur at this site during a major earthquake, which will require mitigation of susceptible soils, such as installing aggregate columns.
5. Foundations and floor slabs may be constructed on undisturbed natural soils or on select structural/engineered fill which extends to natural soils, reinforced with aggregate piers as discussed in **Section 7.0**.

CMT must assess that topsoil, undocumented fills, debris, loose/disturbed or other unsuitable soils have been removed and that undisturbed natural soils have been encountered prior to placing structural fills, site grading fills, footings, slabs, and pavements. In the following sections, detailed discussions pertaining to the site are provided, including subsurface descriptions, geologic setting, seismicity, earthwork, foundations, lateral resistance, lateral pressure, floor slabs, and pavements.

2.0 FIELD EXPLORATION

2.1 General

To define and evaluate the subsurface soil and groundwater conditions, 13 bore holes were drilled at the site to depths of approximately 6 to 51.5 feet below the existing ground surface. Locations of the bore holes are shown on ***Figure 1, Site Plan***, included in the Appendix. The field exploration was performed under the observation of an experienced member of our geotechnical staff.

Samples of the subsurface soils encountered in the bore holes were collected at varying depths through the hollow stem drill augers. Relatively undisturbed samples of the subsurface soils were obtained by hydraulically pushing a 3-inch diameter (Shelby) tube and/or driving a split-spoon sampler with 2.5-inch outside diameter rings/liners into the undisturbed soils below the drill augers. Disturbed samples were collected utilizing a standard split spoon sampler that was driven 18 inches into the soils below the drill augers using a 140-pound hammer free-falling a distance of 30 inches. The number of hammer blows needed for each 6-inch interval was recorded. The sum of the hammer blows for the final 12 inches of penetration is known as a standard penetration test and this ‘blow count’ was recorded on the bore hole logs. Where more than 50 blows occurred before the 6-inch interval was achieved, the sampling was terminated and the number of blows and inches penetrated by the sampler were recorded. The blow count provides an approximation of the relative density of granular soils, but only a limited indication of the relative consistency of silt/clay soils because the consistency of these soils is significantly influenced by the moisture content.

The subsurface soils encountered in the bore holes were classified in the field based upon visual and textural examination, logged and described in general accordance with ASTM[1] D-2488. These field classifications were supplemented by subsequent examination and testing of select samples in our laboratory. Logs of the bore holes, including a description of the soil strata encountered, are presented on each individual Bore Hole Log, ***Figures 2 through 14***, included in the Appendix. Sampling information and other pertinent data and observations are also included on the logs. In addition, a Key to Symbols defining the terms and symbols used on the logs is provided as ***Figure 15*** in the Appendix.

Following completion of drilling operations, 1.25-inch diameter slotted PVC pipe was installed in bore holes B-5, B-6, B-9, and B-10 to allow subsequent water level measurements and the bore holes were backfilled with auger cuttings.

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[1] American Society for Testing and Materials

2.2 Infiltration Testing

Falling-head infiltration testing was performed as part of our field exploration within location I-1 at a depth of about 5 feet below the existing ground surface. The testing consisted of filling the inside of the augers with water and measuring the rate of water drop over time. This process was repeated multiple times until subsequent readings were the same. The results of this test indicate that the silty sand soils at this site have an infiltration rate of approximately 4.3 minutes per inch. This rate could increase (become slower) over time due to siltation, thus we recommend an appropriate factor of safety be applied for design. Also note that infiltration rates can vary depending on locations.

3.0 LABORATORY TESTING

3.1 General

Selected samples of the subsurface soils were subjected to various laboratory tests to assess the following pertinent engineering properties:

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Dry Density, ASTM D-2937, Dry unit weight representing field conditions
3. Atterberg Limits, ASTM D-4318, Plasticity and workability
4. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis
5. One Dimensional Consolidation, ASTM D-2435, Consolidation properties

Laboratory test results are presented on the bore hole logs (***Figures 2 through 14***) and in the following **Lab Summary Table**:

LAB SUMMARY TABLE

BORE HOLE	DEPTH (feet)	SOIL CLASS	SAMPLE TYPE	MOISTURE CONTENT(%)	DRY DENSITY (pcf)	GRADATION			ATTERBERG LIMITS			COLLAPSE (-)/ EXPANSION(+)
						GRAV.	SAND	FINES	LL	PL	PI	
B-1	0	GP-GC	SPT	1		47	46	7				
	5	GP-GC	SPT	5		65	23	12				
B-2	2.5	FILL:GC	SPT	6		48	36	16				
	7.5	GC	SPT	4		45	40	15				
B-4	5	CL	SPT	38		3	19	78				
B-5	5	CL	SPT	17		2	45	53				
	10	GP-GC	SPT	9		58	33	9				
	15	SC	SPT	25		15	63	22				
B-6	5	GC	Rings	20	104							+0.1%
	10	GP-GC	SPT	3		67	25	8				
	15	GP-GC	SPT	6		66	27	7				
	20	GP-GC	SPT	6		72	23	5				
	25	SM	SPT	30		0	69	31		NP	NP	
	30	CL	SPT	33		0	41	59				
	35	CL	SPT	29		0	26	74				
	40	CL	SPT	22					34	21	13	
	45	SP-SC	SPT	25		0	95	5				
B-8	7.5	GC	SPT	4		46	39	15				
B-9	2.5	FILL:CH	SPT	28					55	28	27	
	15	GC	SPT	15		53	21	26				
B-10	10	GP-GC	SPT	5		53	37	10				
	20	CL	SPT	37		0	18	82	35	22	13	
	25	CL	SPT	31		0	31	69				
	30	CL	SPT	32		0	23	77	29	21	8	
B-11	10	GP-GC	SPT	9		61	32	7				
	15	CL	SPT	32		2	36	62				
B-12	10	GC	SPT	10		62	26	12				
	15	ML	SPT	33		0	36	64		NP	NP	
B-13	2.5	CL	Shelby Tube	10	102	0	18	82	39	19	20	+2.9%
	5	GC	SPT	4		44	29	27				

3.2 Collapse/Swell-Consolidation Testing

To provide data for an analysis of potential settlement from structural loading, a one-dimensional consolidation test was performed on each of 2 representative samples of the subsurface clayey soils collected in the bore holes. The collapse/swell portion of the test was performed in accordance with the following procedure:

1. Load sample at in-situ moisture content to specific axial pressure.
2. Measure and record axial deflection.
3. Saturate sample.
4. Measure and record resulting collapse.

The results of the collapse-consolidation tests are presented below:

BORE HOLE	DEPTH (feet)	SOIL CLASS	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	AXIAL LOAD AT SATURATION (psf)	COLLAPSE (-) OR SWELL (+)
B-6	5	CL	20	104	500	+0.1%
B-13	2.5	CL	**10**	102	250	+2.9%

The results of the tests indicate that the near-surface sandy Clay soils within about the upper 5 feet are potentially moderately expansive. Following the collapse/swell portion of the test normal consolidation test loading was applied. Detailed results of the tests are maintained within our files and can be transmitted to you, at your request.

4.0 GEOLOGIC & SEISMIC CONDITIONS

4.1 Geologic Setting

The subject site is located in the Mideast region of Utah Valley in north-central Utah. The site sits at an elevation of approximately 4,580 feet above sea level. Utah Valley is a deep, sediment-filled basin that is part of the Basin and Range Physiographic Province, formed by extensional tectonic processes during the Tertiary and Quaternary geologic time periods. The valley is bordered by the Wasatch Mountain Range on the east and Lake Mountain and West Mountain on the west. Utah Valley is located within the Intermountain Seismic Belt, a zone of active tectonism and seismic activity extending from southwestern Montana to southwestern Utah. The active (evidence of movement within the last 10,000 years) Wasatch Fault Zone is part of the Intermountain Seismic Belt and extends from southeastern Idaho to central Utah along the western base of the Wasatch Mountain Range.

Much of northwestern Utah, including Utah Valley, was also previously covered by the Pleistocene age Lake Bonneville. Utah Lake, which currently occupies much of the western portion of the valley, is a remnant of this ancient freshwater lake. Lake Bonneville reached a high-stand elevation between approximately 5,160 and 5,200 feet above sea level between 18,500 and 17,400 years ago. Approximately 17,400 years ago, the lake breached its basin in southeastern Idaho and dropped relatively fast, by almost 300 feet, as water drained into the Snake River. Following this catastrophic release, the lake level continued to drop slowly over time, primarily driven by drier climatic conditions, until reaching the current levels of Utah Lake and the larger Great Salt Lake to the north. Shoreline terraces formed at the high-stand elevation of the lake and several subsequent lower lake levels are visible in places on the mountain slopes surrounding the valley. Much of the sediment within Utah Valley was deposited as lacustrine sediments during both the transgressive (rise) and regressive (fall) phases of Lake Bonneville and in older, pre-Bonneville lakes that previously occupied the basin.

The geology of the UGS Provo, Utah 7.5 Minute Quadrangle, that includes the location of the subject site, has been mapped by Solomon and Machette[2]. The surficial geology at the site and adjacent properties is mapped

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[2] Solomon, B.J., and Machette, M. N., 2009, Geologic map of the Provo 7.5' quadrangle, Utah County, Utah. M-233. Utah Geological Survey. 1:24,000 scale.

as “Level-2 alluvial-fan deposits" (map unit Qaf_2) dated to be middle Holocene to upper Pleistocene. Unit Qaf_2 is described in the referenced map as “Poorly sorted pebble and cobble gravel, locally bouldery, in a matrix of sand, silt, and minor clay; clasts angular to subrounded, with sparse well-rounded clasts derived from Lake Bonneville gravel; medium to very thick bedded. Deposited by debris flows, debris floods, and stream flow from the Provo River; equivalent to the older part of Qafy but differentiated where deposits are graded slightly above modern stream level and can be mapped separately. Exposed thickness less than 15 feet (5 m).” No fill has been mapped at the location of the site on the geologic map. Refer to **Exhibit 2 - Geologic Map**, shown below.

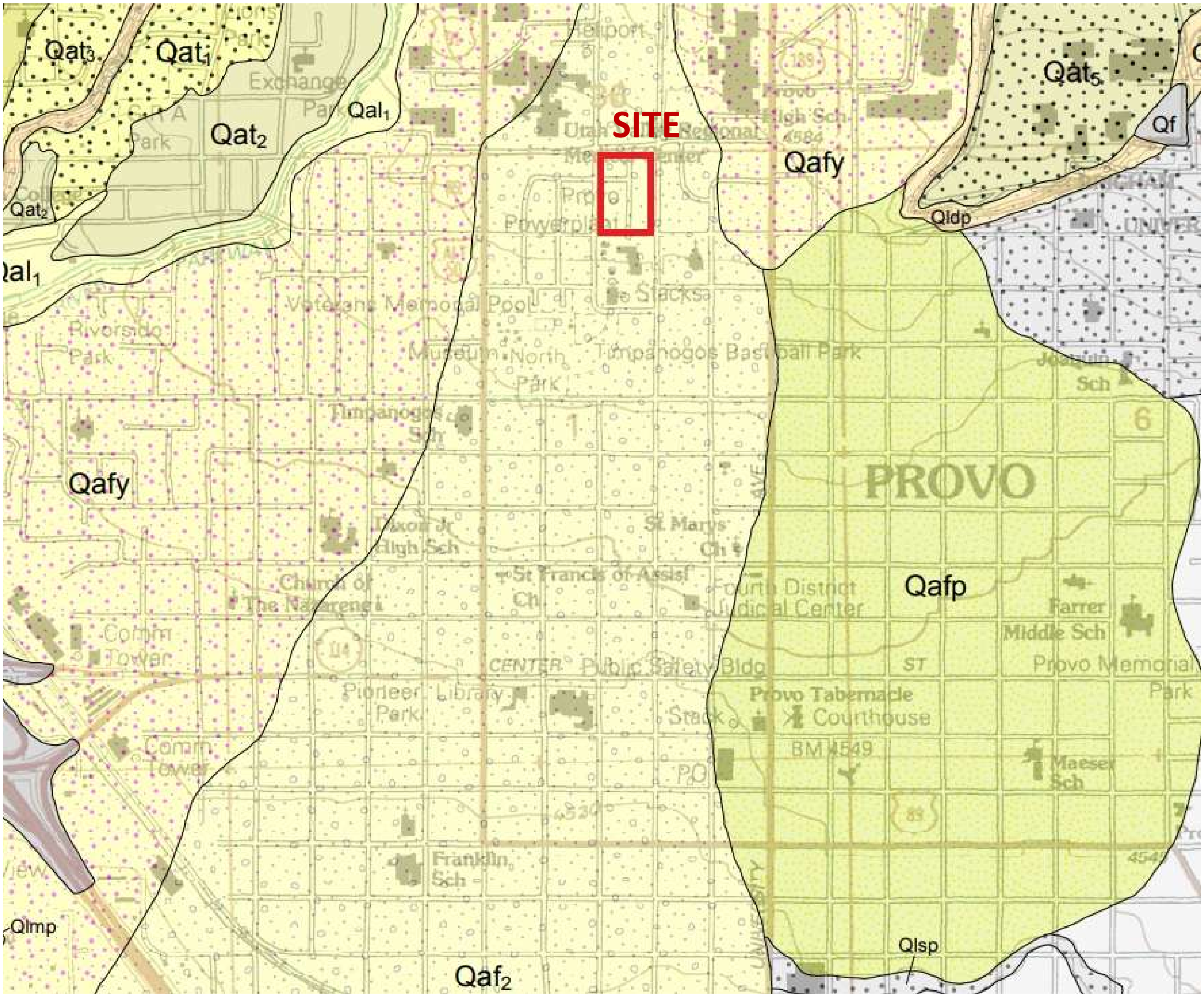

EXHIBIT 2 - GEOLOGIC MAP

4.2 Faulting

No surface fault traces are shown on the referenced geologic map crossing, adjacent to, or projecting toward the subject site. The nearest mapped active fault is the Provo section of the Wasatch fault zone approximately 1.6 miles to the east. Seismic design issues are addressed in **Section 4.3** below.

4.3 Seismicity

4.3.1 Site Class

Utah has adopted the International Building Code (IBC) 2024, which determines the seismic hazard for a site based upon mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented in a website according to latitude and longitude coordinates (grid points). For site class definitions, IBC 2024 Section 1613.2.2 refers to Chapter 20, *Site Classification Procedure for Seismic Design*, of ASCE[3] 7, which stipulates that the measured or estimated average values of shear wave velocity within the upper 100 feet (30 meters) be utilized to determine seismic site class.

CMT has measured the shear wave velocity within the upper 100 feet of the site which resulted in a weighted average shear wave velocity ($V_{S,100}$) of 765 feet per second. Thus, it is our opinion the site best fits Site Class D – Medium Dense Sand or Stiff Clay, which we recommend for seismic structural design.

4.3.2 Ground Motions

IBC 2024 relies on the 2018 USGS National Seismic Hazard Model mapping (USGS Seismic Design Geodatabase) which provides values for multi-period spectral accelerations for each Site Class, based on the shear wave velocity in the upper 100 feet ($V_{S,100}$) for the subject site. The following table and multi-period design response spectrum summarize the peak ground, short period and long period accelerations, as well as individual spectral accelerations for the Design and Risk-Targeted Maximum Considered Earthquake (MCE_R), for the site:

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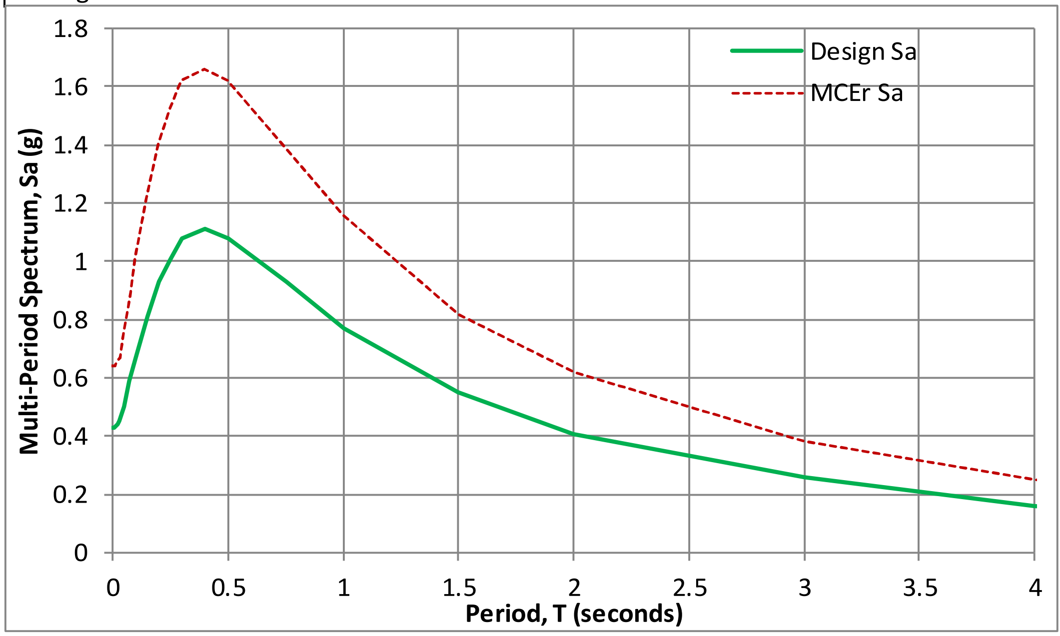
[3] American Society of Civil Engineers Publication 7-22.

PERIOD, T	MAPPED VALUES* (g)	MAPPED MCE_R VALUES* (g)	DESIGN VALUES (g)
Peak Ground Acceleration	PGA_M = **0.620**		PGA_M = 0.620
0.2 sec. (Short Period Acc.)	S_S = **1.530**	S_{MS} = **1.490**	S_{DS} = 0.993
1.0 sec. (Long Period Acc.)	S_1 = **0.560**	S_{M1} = **1.160**	S_{D1} = 0.773

INPUTS Assumed Risk Category: **III** * From https://www.seismicmaps.org/

Latitude: **40.2454** Measured Vs: **765** Site Class: **D**

Longitude: **-111.6633** Correlated Vs:



MULTI-PERIOD SPECTRUM*

Period	Design Sa	MCEr Sa
0	0.43	0.640
0.01	0.43	0.640
0.02	0.44	0.660
0.03	0.45	0.670
0.05	0.5	0.750
0.075	0.59	0.880
0.1	0.67	1.010
0.15	0.81	1.220
0.2	0.93	1.400
0.25	1.01	1.520
0.3	1.08	1.620
0.4	1.11	1.660
0.5	1.08	1.620
0.75	0.93	1.390
1	0.77	1.160
1.5	0.55	0.820
2	0.41	0.620
3	0.26	0.380
4	0.16	0.250
5	0.11	0.170
7.5	0.051	0.076
10	0.03	0.045

4.3.3 Liquefaction

The site is located within an area designated by the Utah Geologic Survey (Utah County) [4] as having "Moderate" liquefaction potential. Liquefaction is defined as the condition when saturated, loose, sandy soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event. Clayey soils, even if saturated, will generally not liquefy during a major seismic event.

We evaluated the liquefaction potential of the site using the procedures described in Youd et al[5] and Idriss & Boulanger[6], applied to the saturated silty/sandy deposits. Our evaluation indicates isolated layers of saturated silty/sandy soils could liquefy between depths of 15 and 50 feet during a major seismic event. Maximum

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[4] Utah Geological Survey, "Liquefaction-Potential Map for a Part of Utah County, Utah," Utah Geological Survey Public Information Series 28, August 1994. https://ugspub.nr.utah.gov/publications/public_information/pi-28.pdf

[5] Youd, T.L.; Idriss, I.M.; Andrus, R.D.; Arango, I.; Castro, G.; Christian, J.T.; Dobry, R.; Finn, W.D.L.; Harder, L.F. Jr.; Hynes, M.E.; Ishihara, K.; Koester, J.P.; Liao, S.C.; Marcuson, W.F. III; Martin, G.R.; Mitchell, J.K.; Moriwaki, Y.; Power, M.S.; Robertson, P.K.; Seed, R.B.; and Stokoe, K.H. II; October 2001, "Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils," ASCE Journal of Geotechnical and Geoenvironmental Engineering, p 817-833.

[6] Idriss, I.M. and Boulanger, R.W., December 2010, "SPT-Based Liquefaction Triggering Procedures," Department of Civil & Environmental Engineering, University of California at Davis, Report No. UCD/CGM 10/02, 259 p.

anticipated settlement resulting from the liquefaction is in the range of 1.6 to 2.2 inches at the top of the liquefiable soil layers which we estimate could result in more than 1 inch of differential settlement. Typically, more than 4 inches of settlement could cause collapse and more than 2 inches of settlement could cause major damage.

In addition, we estimate approximately 11 up to 39 inches of lateral spreading could occur due to liquefaction. Thus, we recommend mitigation to reduce or limit structural damage due to liquefaction. Mitigation could include installing aggregate piers on a grid pattern beneath the entire building to a minimum depth of 20 feet, or applying a structural solution such as tying all footings together using grade beams and/or reinforced slabs (which should be evaluated and designed by a qualified structural engineer).

4.4 Other Geologic Hazards

No landslide deposits or features, including break away scarps or other features associated with lateral spreading, are mapped on or adjacent to the site. The site is not located within a known or mapped potential debris flow, stream flooding[7], or rock fall hazard area.

5.0 SITE CONDITIONS

5.1 Surface Conditions

The site is currently vacant land within the southern two-thirds with asphalt paved parking areas within the northern one-third. Overall, the site is relatively flat, with a very slight slope downward to the west. Based upon aerial photos dating back to 1993 that are readily available on the internet, the site was previously occupied by single-family residences which were removed between 2013 and 2016. The site is bordered on the north by 940 North Street , on the east by Freedom Boulevard (200 West) , on the south by 800 North Street, and on the west by 300 West Street (see **Vicinity Map** in **Section 1.1** above).

5.2 Subsurface Soils

At the location of bore hole B-4, we encountered approximately 12 inches of topsoil at the surface. At the locations of the bore holes B-2, B-3, and B-5 through B-9, we encountered approximately 1 to 7 feet of fill soils, which consisted of gravelly to sandy clay; these soils are considered undocumented/untested/non-engineered. At the locations of bore holes B-10 through B-13, we encountered approximately 3 inches of asphalt at the surface. We encountered natural soils beneath the topsoil/fill soils/asphalt, consisting predominately of GRAVEL with varying amounts of clay and sand (GC, GP-GC) extending to depths of about 20 to 25 feet below the surface, with occasional near surface layers of CLAY (CL) with varying amounts of sand and gravel extending to about 10 feet below the ground surface. Natural SAND with varying amounts of silt or clay (SM, SC, SP-SC) as well as CLAY with varying amounts of sand (CL) were encountered below the surficial clay or gravel layers extending to the maximum depth penetrated of approximately 51.5 feet.

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[7] https://msc.fema.gov/portal/firmette?latitude=40.245242&longitude=-111.663208

The silt/clay soils were slightly moist to wet, gray in color, and very soft to medium stiff in consistency. They also exhibited moderate over consolidation and strength characteristics, as well as a moderate potential (up to 2.9%) for swell when wetted.

The natural gravel and sand soils were moist to wet, brown to gray in color, and medium dense to very dense based on the blow counts in the bore holes. They will also exhibit moderately high strength and low compressibility characteristics.

For a more descriptive interpretation of subsurface conditions, please refer to the bore hole logs, ***Figures 2 through 14***, which graphically represent the subsurface conditions encountered. The lines designating the interface between soil types on the logs generally represent approximate boundaries; in situ, the transition between soil types may be gradual.

5.3 Groundwater

Groundwater was encountered in the bore holes at depths of about 10 to 20 feet below existing grade at the time of our field exploration. On June 25, 2026, CMT personnel returned to the site to measure groundwater levels at depths of 10.0 to 11.5 feet within slotted PVC pipes installed in bore holes B-5, B-6, B-9, and B-10. These depths to groundwater could affect excavations and construction.

Groundwater levels can fluctuate seasonally. Numerous other factors such as heavy precipitation, irrigation of neighboring land, and other unforeseen factors, may also influence ground water elevations at the site. The detailed evaluation of these and other factors, which may be responsible for ground water fluctuations and the magnitude of potential fluctuations, is beyond the scope of this study.

5.4 Site Subsurface Variations

Based on the results of the subsurface explorations and our experience, variations in the continuity and nature of subsurface conditions should be anticipated. Due to the heterogeneous characteristics of natural soils, care should be taken in interpolating or extrapolating subsurface conditions between or beyond the exploratory locations.

Undocumented fill was encountered in the bore holes and will vary in extent and depth throughout the site.

Due to the potential for groundwater fluctuations, we recommend that the owner, owner's representative or contractor verify soil and groundwater conditions upon commencement of construction activities.

6.0 SITE PREPARATION AND GRADING

6.1 General

All deleterious materials should be stripped from the site prior to commencement of construction activities. This includes loose and disturbed soils, topsoil, vegetation, etc. Based upon the conditions observed at the time of our subsurface exploration, approximately 3 to 7 feet of undocumented fill is present on the surface of the site. All undocumented fill shall be removed from beneath structures, but may remain beneath flatwork and pavements, provided they are properly prepared and the owner understands that additional maintenance may be required. Outside of building footprints, proper preparation of undocumented fill and disturbed soils shall consist of removing the upper 12 inches, scarifying to a minimum depth of 8 inches, moisture conditioning as needed and compacting the scarified soils in place. The exposed subgrade must then be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or loose soils are encountered, they must be removed (up to a maximum depth of 2 feet) and replaced with structural fill. The removed soils should then be replaced with structural fill per Section 6.3 and compacted to the same requirements as structural fill as outlined below in Section 6.4. Removals should extend at least 4 feet beyond the perimeter of structures and at least 2 feet beyond the perimeter of flatwork and pavement.

Following stripping, clearing and/or grubbing, the site should be observed by a CMT geotechnical engineer to assess that undisturbed natural soils have been exposed and any deleterious materials, undocumented fill/disturbed and/or loose soils have been removed or properly prepared, prior to placing structural fills, site grading fills, footings, slabs, and pavements.

Fill placed over large areas to raise overall site grades can induce settlements in the underlying natural soils. If more than 3 feet of site grading fill is anticipated over the natural ground surface, we should be notified to assess potential settlements and provide additional recommendations as needed. These recommendations may include placement of the site grading fill far in advance to allow potential settlements to occur prior to construction.

Where the ground surface slopes steeper than 5H:1V (Horizontal:Vertical), the ground should be benched prior to placing fill (following stripping and grubbing the site as discussed above) such that the fill is placed on relatively level surfaces and against vertical surfaces. We recommend maximum bench heights of 4 feet with the lowest bench cut and keyed at least 3 feet deep and 6 feet wide into the bottom of the slope.

6.2 Temporary Excavations

Excavations deeper than 8 feet are not anticipated at the site. Relatively shallow groundwater was encountered and later measured at depths of 10 to 11.5 feet below the existing ground surface. We anticipate that excavations extending below a depth of about 9 feet will likely encounter groundwater, and dewatering of such excavations will likely be required.

The natural soils encountered at this site predominantly consisted of non-plastic silt and sand/gravel.

For non-plastic silt and sandy/gravelly (cohesionless) soils, temporary construction excavations not exceeding 4 feet in depth should be no steeper than one-half horizontal to one vertical (0.5H:1V). For excavations up to 8 feet and above groundwater, side slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult to maintain and will require very flat side slopes and/or shoring, bracing and dewatering.

All excavations must be inspected periodically by qualified personnel. If any signs of instability or excessive sloughing are noted, immediate remedial action must be initiated. All excavations should be made following OSHA safety guidelines.

6.3 Fill Material

Structural fill is defined as fill that will ultimately be subjected to structural loads imposed by footings, floor slabs, pavements, etc. Structural fill will be required as backfill over foundations and utilities, as site grading fill, and potentially as replacement fill, below footings. All fill materials must be free of sod, rubbish, topsoil, frozen soil, and other deleterious materials. Recommendations for the various fill types we anticipate will be used at this site are provided in the following table:

FILL MATERIAL TYPE	DESCRIPTION | RECOMMENDED SPECIFICATION
Select Structural Fill	Placed below structures, flatwork and pavement. Well-graded sand/gravel mixture, with maximum particle size of 4 inches, a minimum 70% passing 3/4-inch sieve, approximately 30% to 60% passing the No. 4 sieve, a maximum 20% passing the No. 200 sieve, a maximum Liquid Limit of 30 and a maximum Plasticity Index of 10.
Site Grading Fill	Placed over large areas to raise the site grade. Sandy to gravelly soil, with a maximum particle size of 6 inches, a minimum 70% passing 3/4-inch sieve, a maximum 50% passing No. 200 sieve, a maximum Liquid Limit of 35 and a maximum Plasticity Index of 15.
Non-Structural Fill	Placed below non-structural areas, such as landscaping. On-site soils or imported soils, with a maximum particle size of 8 inches, including silt/clay soils not containing excessive amounts of degradable/organic material (see discussion below).
Stabilization Fill	Placed to stabilize soft areas prior to placing structural fill and/or site grading fill. Coarse angular gravels and cobbles 1 inch to 8 inches in size. May also use 1.5- to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i, or equivalent (see **Section 6.6**).

Near-surface sand and gravel soils do not appear suitable for use as structural fill but may be used as site grading fill and non-structural fill.

All fill material should be approved by a CMT geotechnical engineer prior to placement.

6.4 Fill Placement and Compaction

The various types of compaction equipment available have their limitations as to the maximum lift thickness that can be compacted. For example, hand operated equipment is limited to lifts of about 4 inches and most “trench compactors” have a maximum, consistent compaction depth of about 6 inches. Large rollers, depending on soil and moisture conditions, can achieve compaction at 8 to 12 inches. The full thickness of each lift should be compacted to at least the following percentages of the maximum dry density as determined by ASTM D-1557 (or AASHTO[8] T-180) in accordance with the following recommendations:

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
Beneath an area extending at least 4 feet beyond the perimeter of structures, and below flatwork and pavement (applies to structural fill and site grading fill) extending at least 2 feet beyond the perimeter	0 to 5 5 to 8	95 98
Site grading fill outside area defined above	0 to 5 5 to 8	92 95
Utility trenches within structural areas	--	96
Roadbase and subbase	-	96
Non-structural fill	0 to 5 5 to 8	90 92

Fills greater than 8 feet thick are not anticipated at the site. For best compaction results, we recommend that the moisture content for structural fill/backfill be within 2% of optimum. Field density tests should be performed on each lift as necessary to verify that proper compaction is being achieved.

6.5 Utility Trenches

For the bedding zone around the utility, we recommend utilizing sand bedding fill material that meets current APWA[9] requirements.

All utility trench backfill material below structurally loaded facilities (foundations, floor slabs, flatwork, parking lots/drive areas, etc.) should be placed at the same density requirements established for structural fill in the previous section.

Most utility companies and local governments are requiring Type A-1a or A-1b (AASHTO Designation) soils (sand/gravel soils with limited fines) be used as backfill over utilities within public rights of way, and the backfill be compacted over the full depth above the bedding zone to at least 96% of the maximum dry density as determined by AASHTO T-180 (ASTM D-1557). The on-site sand and gravel soils at this site will not likely meet these specifications.

Where the utility does not underlie structurally loaded facilities and public rights of way, natural soils may be utilized as trench backfill above the bedding layer, provided they are properly moisture conditioned and compacted to the minimum requirements stated above in **Section 6.4**.

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[8] American Association of State Highway and Transportation Officials
[9] American Public Works Association

6.6 Stabilization

The natural silt/clay soils at this site will likely be susceptible to rutting and pumping. The likelihood of disturbance or rutting and/or pumping of the existing natural soils is a function of the moisture content, the load applied to the surface, as well as the frequency of the load. Consequently, rutting and pumping can be reduced by avoiding concentrated traffic, reducing the load applied to the surface by using lighter equipment and/or partial loads, by working in drier times of the year, or by providing a working surface for the equipment. Rubber-tired equipment particularly, because of high pressures, promotes instability in moist/wet, soft soils.

If rutting or pumping occurs, traffic should be stopped and the disturbed soils should be removed and replaced with stabilization material. Typically, a minimum of 18 inches of the disturbed soils must be removed to be effective. However, deeper removal is sometimes required.

To stabilize soft subgrade conditions (if encountered), a mixture of coarse, clean, angular gravels and cobbles and/or 1.5- to 2.0-inch clean gravel should be utilized. This coarse material may be placed and worked into the soft soils until firm and non-yielding, or the soft soils may be removed an additional 18 inches (minimum) and backfilled with clean stabilizing angular gravels/cobbles. A test area should be implemented to achieve a proper stabilization strategy. Often the amount of gravelly material can be reduced with the use of a geotextile fabric such as Mirafi RS280i, or equivalent. Its use will also help avoid mixing of the subgrade soils with the gravelly material. After excavating the soft/disturbed soils, the fabric should be spread across the bottom of the excavation and up the sides a minimum of 18 inches. Otherwise, it should be placed in accordance with the manufacturer’s recommendation, including proper overlaps. The gravel material can then be placed over the fabric in compacted lifts as described above.

7.0 FOUNDATION RECOMMENDATIONS

The following recommendations have been developed based on the previously described project characteristics, the subsurface conditions observed in the field and the laboratory test data, as well as common geotechnical engineering practice. As discussed previously, calculated liquefaction induced settlement ranged from 1.6 to 2.2 inches with up to 39 inches of liquefaction-induced lateral spreading possible. Estimated differential settlement over about 20 feet is predicted to be about half of the total settlement. Due to the potential for liquefaction-induced movements, we recommend that a grid of aggregate piers be installed to a depth of at least 30 feet across the building site to mitigate liquefaction potential.

7.1 Aggregate Pier Soil Improvement

Aggregate pier subgrade improvements generally consist of two methods (Geopiers/stone columns).

Geopiers soil reinforcement elements are constructed by drilling a 24- or 30-inch diameter hole, removing a volume of soil, or penetrating the ground with a steel mandral and then building a bottom bulb of clean, open-graded stone using a beveled, high-energy tamper. Stone columns are installed utilizing a vibrating mandral.

Gravel is fed internally through the mandral to the bottom of the reinforced zone and the gravel consolidated with vibration.

Column lengths for this project will likely extend to a depth of approximately 20 to 25 feet from the existing ground surface; the result of construction is a reinforced zone of soil directly under footings and slabs that allows for the construction of shallow spread footings proportioned for a relatively high bearing pressure. Geopiers/stone column elements are spaced singly or in close groups to support concentrated column loads. The Geopiers/stone columns will also mitigate the liquefaction potential and would be, in this case, installed on a grid below floor slabs as well.

Geopiers/stone columns soil reinforcement should be designed and constructed by an installer licensed foundation company. The installer should provide a Geopiers/stone column layout and detailed design calculations sealed by a professional engineer licensed in the State of Utah. The design calculations should demonstrate that Geopiers/stone columns soil reinforcement is designed to control settlement to magnitudes within the criteria for this project and mitigate the liquefaction.

Typically design net bearing pressure for spread footings installed over Geopiers/stone columns may be on the order of 4,000 to 5,000. Final design will be provided by the Geopiers/stone columns contractor selected.

We also recommend the following:

1. Exterior footings subject to frost should be placed at least 30 inches below final grade.
2. Interior footings not subject to frost should be placed at least 12 inches below grade.
3. Continuous footing widths should be maintained at a minimum of 18 inches.
4. Spot footings should be a minimum of 24 inches wide.

7.2 Installation

Under no circumstances shall foundations be placed on undocumented fill, topsoil with organics, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

Deep, large roots may be encountered where trees and larger bushes are located or were previously located at the site; such large roots should be removed. If unsuitable soils (as listed above) are encountered, they must be completely removed and replaced with properly compacted structural fill. Excavation bottoms should be observed by a CMT geotechnical engineer to assess that undisturbed natural bearing soils have been exposed.

All structural fill placed below footings should meet the requirements for such and should be placed and compacted in accordance with **Section 6.4** above. The width of structural replacement fill below footings should be equal to the width of the footing plus 1 foot for each foot of fill thickness. For instance, if the footing width is 2 feet and the structural fill depth beneath the footing is 2 feet, the fill replacement width should be 4 feet, centered beneath the footing.

Where the structural fill thickness will be greater than 3 feet, the minimum thickness of structural fill below footings should be equivalent to one-third the thickness of structural fill below any other portion of the foundations. For example, if footings will cross over an area where an old basement was backfilled, and the maximum depth of structural fill used for the backfill is 6 feet, all footings for the new structure should be underlain by a minimum 2 feet of structural fill.

7.3 Estimated Settlement

Foundations designed and constructed in accordance with our recommendations could experience settlement, but we anticipate that total settlements of footings founded as recommended above will not exceed 1 inch, with differential settlements on the order of 0.5 inches over a distance of 25 feet. We expect approximately 50% of the total settlement to initially take place during construction. These settlements do not include liquefaction-induced settlements (see **Section 4.3.3**).

7.4 Lateral Resistance

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the supporting soils. In determining frictional resistance, a coefficient of 0.30 for natural silt/clay soils or 0.40 for natural sand/gravel soils and structural fill, may be utilized for design. Passive resistance provided by properly placed and compacted structural fill above the water table may be considered equivalent to a fluid with a density of 425 pcf. A combination of passive earth resistance and friction may be utilized if the passive resistance component of the total is divided by 1.5. Note that frictional resistance is mobilized as soon as any movement occurs, while full passive pressure is typically achieved after a small amount of movement occurs (approximately 0.5% of the footing height).

8.0 LATERAL EARTH PRESSURES

We anticipate that below-grade walls up to 4 feet high might be constructed at this site. The lateral earth pressure values given below are for a backfill material that will consist of drained sand/gravel soils (less than 10% passing No. 200 sieve) placed and compacted in accordance with the recommendations presented herein. If other soil types will be used as backfill, we should be notified so that appropriate modifications to these values can be provided, as needed.

The lateral pressures imposed upon subgrade facilities will depend upon the relative rigidity and movement of the backfilled structure. The recommended lateral pressure values are shown in the table below, which also assume that the soil surface behind the wall is horizontal and that the backfill within 3 feet of the wall will be compacted with hand-operated compacting equipment. Since the proposed subgrade wall is anticipated to be less than 12 feet high, employing a seismic at-rest lateral earth pressure for design is not needed.

CONDITION	STATIC (psf/ft)*	SEISMIC (psf/ft)**
Active Pressure (wall is allowed to yield, i.e. move away from the soil, with a minimum 0.001H movement/rotation at the top of the wall, where "H" is the total height of the wall)	35	27
At-Rest Pressure (wall is not allowed to yield)	55	N/A
Passive Pressure (wall moves into the soil)	425	185

*Equivalent Fluid Pressure (applied at 1/3 Height of Wall)

**Equivalent Fluid Pressure (added to static and applied at 1/3 Height of Wall)

9.0 FLOOR SLABS

Properly engineered floor slabs should be established upon uniform bearing soils comprised of undisturbed uniform natural soils or on select structural fill extending to undisturbed natural soils (similar to foundations). Under no circumstances shall floor slabs be established directly on any topsoil, undocumented fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. Floor slabs should be properly designed by a structural engineer to accommodate anticipated loads.

To facilitate curing of the concrete, we recommend that floor slabs be directly underlain by at least 4 inches of moist aggregate base or bedding material, or "free-draining" fill such as "pea" gravel or 3/4-inch to 1-inch minus, clean, gap-graded gravel. To help control normal shrinkage and stress cracking, the floor slab thickness and joint layout should be designed by a qualified engineer. Design provisions should address the following items:

1. Adequate reinforcement for the anticipated floor loads;
2. Using smooth bar reinforcement for load transfer through interior floor joints;
3. Portland cement concrete mix design selection to minimize shrinkage concerns;
4. Joint layout and spacing in accordance with ACI[10] or other local standards; and
5. Properly isolate floor slabs from foundations and other structural elements per recommendations provided by ACI 302 (Guide to Concrete Floor and Slab Construction).

10.0 DRAINAGE RECOMMENDATIONS

Some of the on-site near-surface clayey soils are potentially expandable when subjected to water, thus it is very important to the long-term performance of foundations and floor slabs that water not be allowed to collect near the foundation walls and infiltrate into the underlying soils. We recommend the following:

1. All areas around the structure should be sloped to provide drainage away from the foundations. We recommend a minimum slope of 6 inches in the first 10 feet away from the structure. This slope should be maintained throughout the lifetime of the structure.

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[10] American Concrete Institute

2. All roof drainage should be collected in rain gutters with downspouts designed to discharge at least 10 feet from the foundation walls or well beyond the backfill limits, whichever is greater.

3. Adequate compaction of the foundation backfill should be provided. We suggest a minimum of 90% of the maximum laboratory density as determined by ASTM D-1557. Water consolidation methods should not be used under any circumstances.

4. Landscape sprinklers should be aimed away, and maintained a distance of at least 4 feet, from the foundation walls. The sprinkling systems should be designed with proper drainage and be well-maintained. Over watering should be avoided.

5. Other precautions that may become evident during construction.

11.0 PAVEMENTS

Proper preparation of undocumented fill and disturbed soils beneath pavement areas shall consist of removing the upper 12 inches for asphalt pavement or 18 inches for concrete pavement, scarifying to a minimum depth of 8 inches and compacting the soils in place. The exposed subgrade must then be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or loose soils are encountered, they must be removed (up to a maximum depth of 2 feet) and replaced with structural fill.

We anticipate the on-site silt/clay soils will exhibit poor pavement support characteristics when saturated or nearly saturated. Based on our laboratory testing experience with similar soils, our pavement design is based upon a California Bearing Ratio (CBR) of 4 for the on-site silt/clay soils. Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for the given ESAL's (18-kip equivalent single-axle loads) per day:

MATERIAL	PAVEMENT SECTION THICKNESS (inches)			
	PARKING AREAS (6 ESAL’s per day)		DRIVE AREAS (9 ESAL's per day)	
Asphalt	**3**	**3**	**3**	**3**
Road-Base (UTBC)	**11**	**5**	**12**	**5**
Subbase	**0**	**8**	**0**	**9**
Total Thickness	**14**	**16**	**15**	**17**

Untreated base course (UTBC), typically known as road-base, should conform to APWA specifications, or to 1.5-inch-minus UDOT specifications for A–1-a/NP, and have a minimum CBR value of 70%. Subbase should be a granular material having a minimum CBR value of 40%. Road base and subbase material should be compacted as recommended above in **Section 6.4**. Asphalt material generally should conform to APWA requirements, having a ½-inch maximum aggregate size, a 75-gyration Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder.

For dumpster pads, we recommend a pavement section consisting of 6.5 inches of Portland cement concrete and 6 inches of aggregate base over properly prepared natural subgrade or site grading structural fills extending to undisturbed natural soils. Dumpster pads constructed overlying undocumented fills must be avoided or heavily reinforced.

12.0 QUALITY CONTROL

We recommend that CMT be retained as part of a comprehensive quality control testing and observation program. With CMT onsite we can help facilitate implementation of our recommendations and address, in a timely manner, any subsurface conditions encountered which vary from those described in this report. Without such a program CMT cannot be responsible for application of our recommendations to subsurface conditions which may vary from those described herein. This program may include, but not necessarily be limited to, the following:

12.1 Field Observations

Observations should be completed during all phases of construction such as site preparation, foundation excavation, structural fill placement and concrete placement.

12.2 Fill Compaction

Compaction testing by CMT is required for all structural supporting fill materials. Maximum Dry Density (Modified Proctor, ASTM D-1557) tests should be requested by the contractor immediately after delivery of any fill materials. The maximum density information should then be used for field density tests on each lift as necessary to verify that the required compaction is being achieved.

12.3 Excavations

All excavation procedures and processes should be observed by a geotechnical engineer from CMT or their representative. In addition, for the recommendations in this report to be valid, all backfill and structural fill placed in trenches and all pavements should be density tested by CMT. We recommend that freshly mixed concrete be tested by CMT in accordance with ASTM designations.

13.0 LIMITATIONS

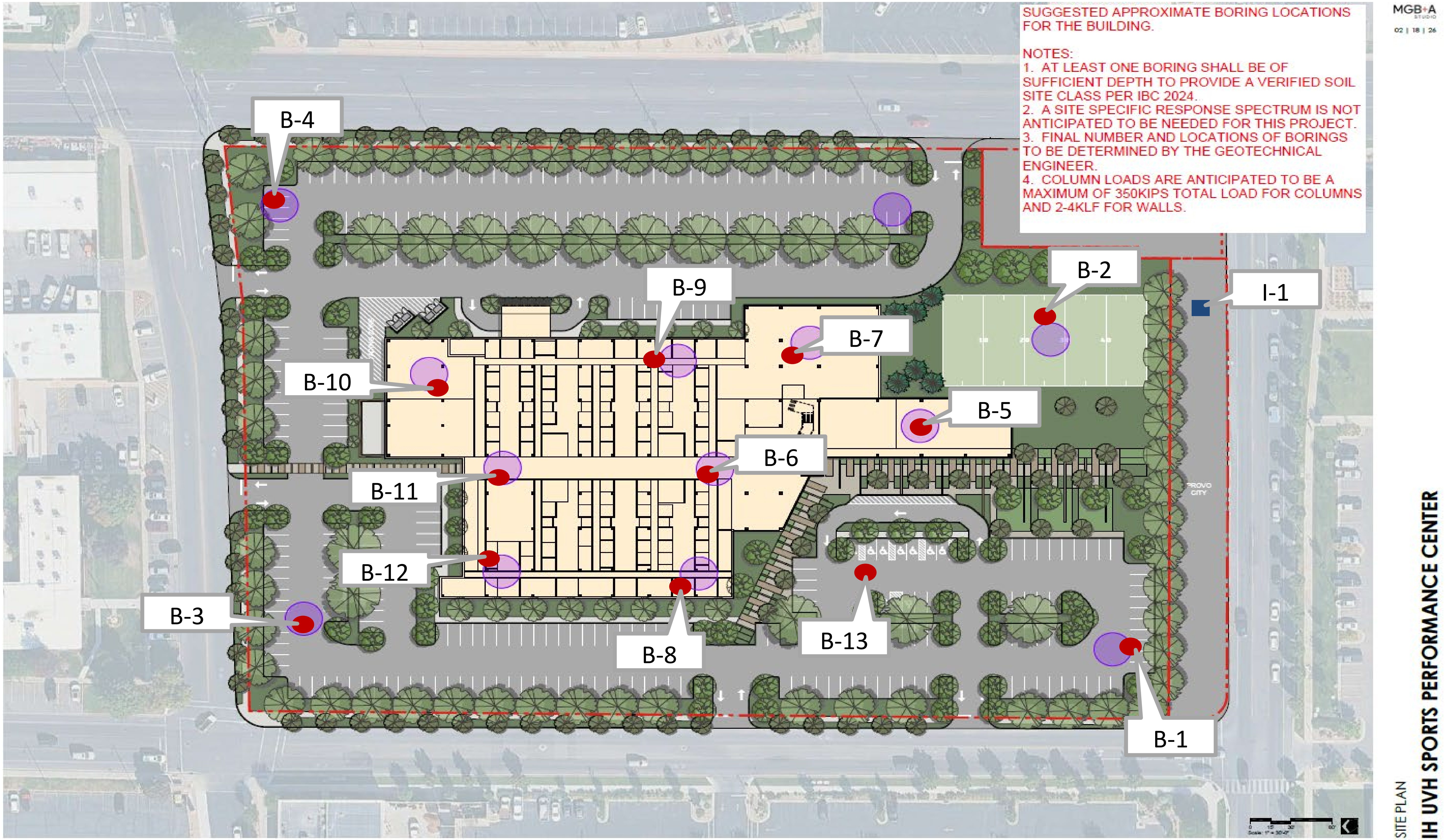
The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground water conditions may differ from conditions encountered at the actual exploration locations. The nature and extent of any variation in the explorations may not become evident until during the course of construction. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation.

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

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at (801) 590-0394. To schedule materials testing, please call (801) 381-5141.

APPENDIX

SUPPORTING DOCUMENTATION



SUGGESTED APPROXIMATE BORING LOCATIONS FOR THE BUILDING.

NOTES:

1. AT LEAST ONE BORING SHALL BE OF SUFFICIENT DEPTH TO PROVIDE A VERIFIED SOIL SITE CLASS PER IBC 2024.
2. A SITE SPECIFIC RESPONSE SPECTRUM IS NOT ANTICIPATED TO BE NEEDED FOR THIS PROJECT.
3. FINAL NUMBER AND LOCATIONS OF BORINGS TO BE DETERMINED BY THE GEOTECHNICAL ENGINEER.
4. COLUMN LOADS ARE ANTICIPATED TO BE A MAXIMUM OF 350KIPS TOTAL LOAD FOR COLUMNS AND 2-4KLF FOR WALLS.

CMT TECHNICAL SERVICES	**Utah Valley Sports Performace Project** About 800 North 200 West, Provo, Utah	**Test Locations**	Date:	11-Jun-2026	Figure:
			CMT No.:	105485	1

Utah Valley Sports Performance Project Bore Hole Log B-1

About 880 North 200 West, Provo, Utah

Total Depth: 6.5'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Sandy GRAVEL with clay (GP-GC) dry, loose	◣	1	4 4 3	7	1		47	46	7			
			◣	2	3 1 2	3								
4														
		moist, medium dense	◣	3	9 13 14	27	5		65	23	12			
		END AT 6.5'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.2445681°, -111.6637818°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 2

Utah Valley Sports Performance Project Bore Hole Log B-1

About 880 North 200 West, Provo, Utah

Total Depth: 6.5'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
28		A = asphalt/concrete												
32														
36														
40														
44														
48														
52														
56														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.2445681°, -111.6637818°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure: 2

Utah Valley Sports Performance Project Bore Hole Log

B-2

About 880 North 200 West, Provo, Utah

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Blows (N) Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0	▨	FILL: silty gravel with sand	◤	4	7 7 5	12								
			◤	5	5 6 6	12	6		48	36	16			
4	▩	Brown Clayey GRAVEL with Sand (GC) slightly moist, dense												
			◤	6	16 18 16	34								
8			◤	7	21 50/4"		4		45	40	15			
			◤	8	28 17 27	44								
12		END AT 11.5'												

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.2447562°, -111.662787°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure:
3

Utah Valley Sports Performance Project Bore Hole Log

B-3

About 880 North 200 West, Provo, Utah

Total Depth: 6'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0	▩	FILL: Aggregate Base	◤	9	6 6 4	10								
	▨	Dark Brown CLAY (CL)												
	⁘	Brown Sandy GRAVEL with clay (GP-GC) slightly moist, medium dense	◤	10	10 13 15	28								
4	⁘													
	⁘	dense	◤	11	11 15 16	31								
		REFUSAL AT 6.0'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.246224°, -111.6636983°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure:
4

Utah Valley Sports Performance Project Bore Hole Log B-4

About 880 North 200 West, Provo, Utah

Total Depth: 6.5'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
0	░	Topsoil: landscaped area												
	▨	Brown CLAY with Sand (CL), trace gravel moist, medium stiff												
	▨		◣	12	2 2 2	4								
4	▨													
	▨	grades black, with roots stiff	◣	13	2 5 11	16	38		3	19	78			
		END AT 6.5'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure:
5

Utah Valley Sports Performance Project Bore Hole Log

B-5

About 880 North 200 West, Provo, Utah

Total Depth: 16.5'
Water Depth: 10', 10.9'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
0	▩	FILL: sandy/gravelly clay												
			◤	14	2 1 1	2								
4	▨	Brown Sandy CLAY (CL) trace gravel moist, soft												
			◤	15	3 1 1	2	17		2	45	53			
8	⁘	Brown Gravel and Sand (GP/SP) moist, medium dense	◤	16	10 11 13	24								
▽ ▼	⁘	Brown Sandy GRAVEL with clay (GP-GC) wet dense	◤	17	11 16 17	33	9		58	33	9			
12														
16	▨	Gray Clayey SAND with gravel (SC) wet, loose	◤	18	4 1 3	4	25		15	63	22			
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater encountered during drilling at depth of 10 feet and measured on 6/25/26 at depth of 10.9 feet.
Slotted PVC pipe installed to depth of 16.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure:
6

Utah Valley Sports Performance Project Bore Hole Log

B-6

About 880 North 200 West, Provo, Utah

Total Depth: 51.5'
Water Depth: 20', 10.5'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
0		FILL: gravel												
		Dark Brown Clayey GRAVEL (GC) some sand moist, loose	◣	19	3 2 2	4								
4														
			⧗	20	3 4 12	16	20	104						
8		Brown Sandy GRAVEL with clay (GP-GC) dry, dense	◣	21	20 50/5"									
▼		slightly moist, medium dense	◣	22	11 11 14	25	3		67	25	8			
12														
		moist, dense	◣	23	11 27 13	40	6		66	27	7			
16														
▽ 20		wet	◣	24	20 27 27	54	6		72	23	5			
24														
		Gray Silty SAND (SM) wet, loose	◣	25	2 2 3	5	30		0	69	31		NP	NP
28														

Remarks: Groundwater encountered during drilling at depth of 20 feet and measured on 6/25/26 at depth of 10.5 feet.
Slotted PVC pipe installed to depth of 26.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure:
7

Utah Valley Sports Performance Project Bore Hole Log B-6

About 880 North 200 West, Provo, Utah

Total Depth: 51.5'
Water Depth: 20', 10.5'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Blows (N) Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
28														
		Gray Sandy CLAY (CL) wet, soft	◣	26	1 1 1	2	33		0	41	59			
32														
36			◣	27	2 2 4	6	29		0	26	74			
40			◣	28	1 1 2	3	22					34	21	13
44														
		Gray SAND with clay (SP-SC) wet, medium dense	◣	29	0 5 15	20	25		0	95	5			
48														
		very dense	◣	30	17 25 30	55								
		END AT 51.5'												
52														
56														

Remarks: Groundwater encountered during drilling at depth of 20 feet and measured on 6/25/26 at depth of 10.5 feet.
Slotted PVC pipe installed to depth of 26.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure: 7

Utah Valley Sports Performance Project Bore Hole Log

B-7

About 880 North 200 West, Provo, Utah

Total Depth: 9'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
0	▨	FILL: gravel and sand												
	░	Dark Brown Silty SAND (SM) slightly moist, medium dense	◣	31	3 6 4	10								
4														
	▦	Brown Sandy GRAVEL with clay (GP-GC) slightly moist, dense	◣	32	13 22 26	48								
8		medium dense	◣	33	13 15 11	26								
		AUGER REFUSAL AT 8.0', END AT 9.0'												
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure:
8

Utah Valley Sports Performance Project Bore Hole Log

B-8

About 880 North 200 West, Provo, Utah

Total Depth: 12'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Blows (N) Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0	▨	FILL: gravel and sand												
	▨	Brown CLAY with Sand (CL) slightly moist, stiff	◤	34	6 8 4	12								
4														
	▨	Brown Clayey GRAVEL with Sand (GC) slightly moist, medium dense	◤	35	9 12 15	27								
8		very dense	◤	36	46 28 29	57	4		46	39	15			
			◤	37	38 28 31	59								
12		REFUSAL AT 12.0'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

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Utah Valley Sports Performance Project Bore Hole Log

B-9

About 880 North 200 West, Provo, Utah

Total Depth: 16.5'
Water Depth: 15', 11.6'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Sand %	Fines %	Atterberg LL	PL	PI
0		FILL: clay (CH) with gravel												
			◣	38	2 2 3	5	28					55	28	27
4														
		no sample recovered	◣	39	0 0 0	0								
		Brown GRAVEL (GP)												
8		very dense	◣	40	5 8 50/5"									
		Clayey GRAVEL with Sand (GC) moist, medium dense	◣	41	19 13 9	22								
▼ 12														
▽		wet	◣	42	19 16 6	22	15		53	21	26			
16														
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater encountered during drilling at depth of 15 feet and measured on 6/25/26 at depth of 11.6 feet.
Slotted PVC pipe installed to depth of 16.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon
Page: 1 of 1

CMT TECHNICAL SERVICES

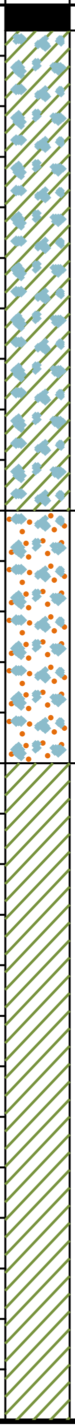
Figure:
10

Utah Valley Sports Performance Project Bore Hole Log B-10

About 880 North 200 West, Provo, Utah

Total Depth: 31.5'
Water Depth: 15', 10.1'

Date: 5/27/26
Job #: 105485



Depth (ft)	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0	3" Asphalt												
	Brown CLAY (CL) with gravel moist, medium stiff												
4													
		◣	43	2 2 3	5								
8													
▼	Brown Sandy GRAVEL with clay (GP-GC) moist, dense	◣	44	10 10 23	33	5		53	37	10			
12													
▽	Gray CLAY with Sand (CL) wet soft	◣	45	2 1 1	2								
16													
20		◣	46	1 1 2	3	37		0	18	82	35	22	13
24													
	grades with more sand stiff	◣	47	2 5 4	9	31		0	31	69			
28													

Remarks: Groundwater encountered during drilling at depth of 15 feet and measured on 6/25/26 at depth of 10.1 feet.
Slotted PVC pipe installed to depth of 16.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

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Figure: 11

Utah Valley Sports Performance Project Bore Hole Log B-10

About 880 North 200 West, Provo, Utah

Total Depth: 31.5'
Water Depth: 15', 10.1'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
28	▨													
	▨		◣	48	2 4 4	8	32		0	23	77	29	21	8
32		END AT 31.5'												
36														
40														
44														
48														
52														
56														

Remarks: Groundwater encountered during drilling at depth of 15 feet and measured on 6/25/26 at depth of 10.1 feet.
Slotted PVC pipe installed to depth of 16.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

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Figure:
11

Utah Valley Sports Performance Project Bore Hole Log B-11

About 880 North 200 West, Provo, Utah

Total Depth: 16.5'
Water Depth: 10'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0	■	3" Asphalt												
	▨	Brown Sandy GRAVEL with clay (GP-GC) moist, medium dense												
4	▨													
	▨		◣	49	15 13 15	28								
8	▨													
▽	▨	wet	◣	50	11 11 9	20	9		61	32	7			
12	▨													
16	▨	Brown Sandy CLAY (CL) wet, soft	◣	51	1 1 2	3	32		2	36	62			
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater encountered during drilling at depth of 10 feet.
Slotted PVC pipe installed to depth of 16.5 feet to facilitate water level measurements.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon
Page: 1 of 1

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Figure:
12

Utah Valley Sports Performance Project Bore Hole Log B-12

About 880 North 200 West, Provo, Utah

Total Depth: 21.5'
Water Depth: 10'

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Blows (N) Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		3.5" Asphalt												
		Brown Clayey GRAVEL with sand (GC) moist, very dense												
4														
			◤	52	27 30 29	59								
8														
▽		wet	◤	53	13 25 39	64	10		62	26	12			
12														
16		Dark Brown Sandy SILT (ML) wet, very soft	◤	54	1 0 1	1	33		0	36	64		NP	NP
20		Gray CLAY (CL) some sand lenses wet, medium stiff	◤	55	1 1 3	4								
		END AT 21.5'												
24														
28														

Remarks: Groundwater encountered during drilling at depth of 10 feet.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon
Page: 1 of 1

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Figure:
13

Utah Valley Sports Performance Project Bore Hole Log B-13

About 880 North 200 West, Provo, Utah

Total Depth: 9'
Water Depth: (see Remarks)

Date: 5/27/26
Job #: 105485

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
						Total			Gravel %	Sand %	Fines %	LL	PL	PI
0	▥	Brown Silty SAND (SM) some roots dry, medium dense	◣	56	8 8 7	15								
4	▨	White CLAY with Sand (CL) with calcium and pinholes slightly moist	ǁ	2.5			10	102	0	18	82	39	19	20
	▨	Brown Clayey GRAVEL with Sand (GC) slightly moist, medium dense	◣	3.5	6 9 14	23	4		44	29	27			
8	▨	very dense	◣	4.5	44 33 36	69								
		AUGER REFUSAL AT 8.5', END AT 9.0'												
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger/Odex
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

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Figure:
14

Utah Valley Sports Performance Project

Key to Symbols

About 880 North 200 West, Provo, Utah

Date: 5/27/26
Job #: 105485

①	②	③	④	⑤	⑥ Blows(N)	⑦	⑧	⑨	⑩ Gradation			Atterberg		
Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #		Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI

COLUMN DESCRIPTIONS

Depth (ft.): Depth (feet) below the ground surface (including groundwater depth - see below right).

Graphic Log: Graphic depicting type of soil encountered (see below).

Soil Description: Description of soils, including Unified Soil Classification Symbol (see below).

Sample Type: Type of soil sample collected; sampler symbols are explained below-right.

Sample #: Consecutive numbering of soil samples collected during field exploration.

Blows: Number of blows to advance sampler in 6" increments, using a 140-lb hammer with 30" drop.

Total Blows: Number of blows to advance sampler the 2nd and 3rd 6" increments.

Moisture (%): Water content of soil sample measured in laboratory (percentage of dry weight).

Dry Density (pcf): The dry density of a soil measured in laboratory (pounds per cubic foot).

Gradation: Percentages of Gravel, Sand and Fines (Silt/Clay), from lab test results of soil passing No. 4 and No. 200 sieves.

Atterberg: Individual descriptions of Atterberg Tests are as follows:

LL = Liquid Limit (%): Water content at which a soil changes from plastic to liquid behavior.

PL = Plastic Limit (%): Water content at which a soil changes from liquid to plastic behavior.

PI = Plasticity Index (%): Range of water content at which a soil exhibits plastic properties (= Liquid Limit - Plastic Limit).

STRATIFICATION	
Description	**Thickness**
Seam	Up to ½ inch
Lense	Up to 12 inches
Layer	Greater than 12 in.
Occasional	1 or less per foot
Frequent	More than 1 per foot

MODIFIERS
Trace
<5%
Some
5-12%
With
> 12%

MOISTURE CONTENT
Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp / moist to the touch, but no visible water.
Saturated: Visible water, usually soil below groundwater.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS SYMBOLS		TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS More than 50% of material is larger than No. 200 sieve size.	**GRAVELS** The coarse fraction retained on No. 4 sieve.	**CLEAN GRAVELS** (< 5% fines)	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 (≥ 12% fines)	GM	▨	Silty Gravels, Gravel-Sand-Silt Mixtures
			GC	▨	Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS The coarse fraction passing through No. 4 sieve.	**CLEAN SANDS** (< 5% fines)	SW	▨	Well-Graded Sands, Gravelly Sands, Little or No Fines
			SP	▨	Poorly-Graded Sands, Gravelly Sands, Little or No Fines
		SANDS WITH FINES (≥ 12% fines)	SM	▨	Silty Sands, Sand-Silt Mixtures
			SC	▨	Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More than 50% of material is smaller than No. 200 sieve size.	**SILTS AND CLAYS** Liquid Limit less than 50%		ML	▨	Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands or Clayey Silts with Slight
			CL	▨	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
			OL	▨	Organic Silts and Organic Silty Clays o f Low Plasticity
	SILTS AND CLAYS Liquid Limit greater than 50%		MH	▨	Inorganic Silts, Micacious or Diatomacious Fine Sand or Silty Soils with Plasticity (Elastic Silts)
			CH	▨	Inorganic Clays of High Plasticity, Fat Clays
			OH	▨	Organic Silts and Organic Clays of Medium to High Plasticity
HIGHLY ORGANIC SOILS			PT	▨	Peat, Humus, Swamp Soils with High Organic Contents

Note: Dual Symbols are used to indicate borderline soil classifications (i.e. GP-GM, SC-SM, etc.).

SAMPLER SYMBOLS

- ◨ Block Sample
- ◩ Bulk/Bag Sample
- ⧗ Modified California Sampler 3.5" OD, 2.42" ID
- ⧗ D&M Sampler
- ▯ Rock Core
- ◪ Standard Penetration Split Spoon Sampler
- ▥ Thin Wall (Shelby Tube)

WATER SYMBOL

- ▽ Encountered Water Level
- ▼ Measured Water Level

(see Remarks on Logs)

1. The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
2. The subsurface conditions represented on the logs are for the locations specified. Caution should be exercised if interpolating between or extrapolating beyond the exploration locations.
3. The information presented on each log is subject to the limitations, conclusions, and recommendations presented in this report.

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Figure:
15