CMT TECHNICAL SERVICES

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

GEOTECHNICAL ENGINEERING STUDY

Beyond Welding and Fabrication

428 West 645 South
Fairfield, Utah

CMT PROJECT NO. 25086

FOR:
Beyond Welding and Fabrication
1285 West 400 South
Orem, Utah 84058

September 24, 2025

September 24, 2025

Mr. Efrain Garcia
Beyond Welding and Fabrication
1285 West 400 South
Orem, Utah 84058

Subject: Geotechnical Engineering Study
Beyond Welding and Fabrication
428 West 645 South
Fairfield, Utah
CMT Project Number: 25086

Mr. Garcia:

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 August 21, 2025, a CMT staff professional was on-site and observed the drilling of 9 bore holes extending to depths of approximately 6.5 to 31.5 feet below the existing ground surface. Samples of the subsurface soils encountered were collected from the bore holes during the field operations and subsequently transported to our laboratory for further observation and testing of select samples.

Conventional isolated and/or continuous footings may be utilized to support the proposed structure(s), 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

LICENSED PROFESSIONAL ENGINEER
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JEFFREY J. EGBERT
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STATE OF UTAH

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TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

CMT Technical Services (CMT) was retained to conduct a geotechnical subsurface study for the proposed warehouse building. The site parcel address is 428 West 645 South in Fairfield, Utah, as shown in **Exhibit 1 - Vicinity Map** below.

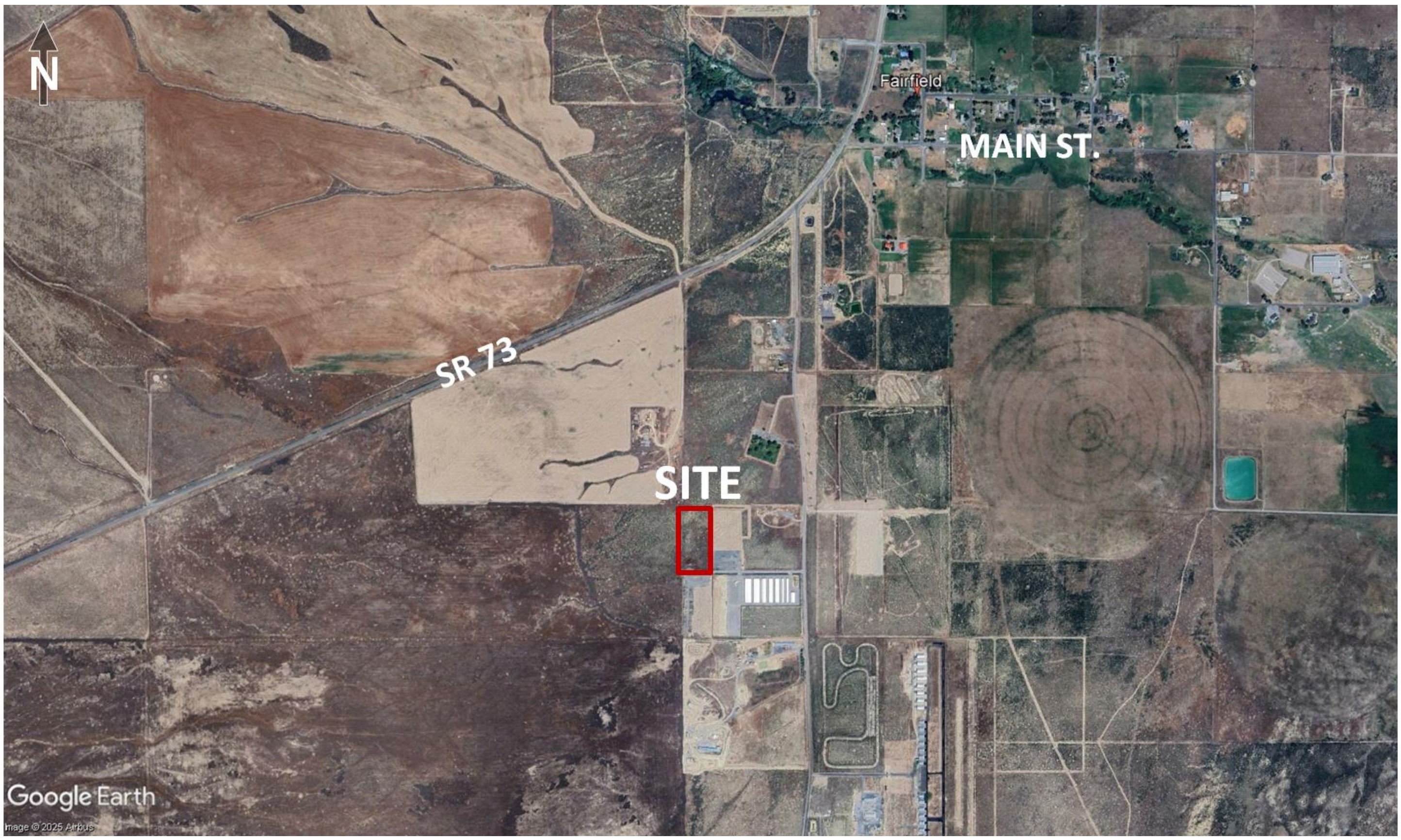


EXHIBIT 1 – VICINITY MAP

1.2 Objectives, Scope and Authorization

The objectives and scope of our study were planned in discussions between Mr. Efraim Garcia of Beyond Welding and Fabrication, 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 9 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 July 8, 2025.

1.3 Description of Proposed Construction

We understand that the proposed construction consists of a warehouse building with a footprint of approximately 10,500 square feet, however six identical buildings may be constructed at the site as part of future, overall development. We project that maximum structural loads will be on the order of 5,000 pounds per linear foot for walls, 150,000 pounds for columns, and a uniform 150 pounds per square foot for floor slabs. If the structural 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 an internal drive lane, 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. Vegetation and approximately 4 inches of topsoil to be removed from the surface of the site.
2. Subsurface soils encountered below the topsoil predominately consisted of Lean CLAY (CL), with a few layers of SAND (SM) and GRAVEL (GM) extending to the maximum depth explored of approximately 31.5 feet below the existing ground surface.
3. Groundwater was not encountered in the bore holes to the maximum depth explored and not expected to be encountered during construction.
4. Liquefaction will not likely occur at this site, thus mitigation is not needed.
5. Subsurface soils displayed moderate to high compressibility characteristics under loading during laboratory testing.
6. To limit potential settlement from structural loading we recommend foundations and floor slabs be constructed on a minimum of 18 inches of properly compacted structural fill extending to undisturbed natural soils.

CMT must assess that topsoil, undocumented fills (if encountered), debris, disturbed or unsuitable soils have been removed and that suitable soils have been encountered prior to placing site grading fills, structural fill, 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, 9 bore holes were drilled at the site to depths of approximately 6.5 to 31.5 feet below the existing ground surface. The approximate locations of the bore holes are shown on ***Figure 1, Site Plan***, included in the Appendix. The bore holes were logged and sampled by 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 were obtained by 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. 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 samples of the subsurface soils retrieved 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, is presented on each individual Bore Hole Log, ***Figures 2 through 10***, 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 11*** in the Appendix.

2.2 Infiltration Testing

A falling-head infiltration test was performed as part of our field exploration within bore hole I-1 at a depth of about 5 feet below the existing ground surface. The test consisted of drilling to the specified depth, sampling, filling the inside of the auger with water, and measuring the rate of water drop over time. This process was repeated multiple times until subsequent readings were reasonably consistent. The results of this test indicate that the silt soil at the test depth and location has an infiltration rate of approximately 10 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 location and soil type.

[1] American Society for Testing and Materials

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
6. California Bearing Ratio, ASTM D-2937, Subgrade support properties
7. Vane Shear Test, ASTM D-4648, Shear strength parameters

Laboratory test results are presented on the bore hole logs (***Figures 2 through 10***), in the following **Lab Summary Table** and in **Sections 3.2 to 3.6**:

LAB SUMMARY TABLE

BORE HOLE	DEPTH (feet)	SOIL CLASS	SAMPLE TYPE	MOISTURE CONTENT(%)	DRY DENSITY (pcf)	GRADATION			ATTERBERG LIMITS		
						GRAV.	SAND	FINES	LL	PL	PI
B-1	2.5	CL	SPT	18				97			
B-1	7.5	CL	Rings	16	90			91	33	17	16
B-1	15	CL	SPT	12				90	27	15	12
B-1	25	CL	SPT	17				92			
B-2	5	CL	Rings	16	80			87			
B-2	7.5	CL	SPT	12		8	23	69			
B-2	20	CL	Rings	18	107			95			
B-3	2.5	CL	Rings	11	98	1	20	79			
B-3	5	SM	SPT	4		25	45	30			
B-3	10	SM	SPT	4		31	49	20			
B-4	2.5	CL	SPT	10				86	37	16	21
B-4	15	CL	Rings	12	94			94	28	15	13
B-5	10	CL	SPT	5	107	37	34	29			
B-7	2.5	CL	SPT	7				94	32	18	14
B-7	7.5	CL	Rings	12	113			90			
B-8	2.5	CL	SPT	3		1	7	92	33	17	16
B-9	2.5	CL	Rings	17	84			93			
I-1	5	ML	SPT	13		0	8	92			

3.2 Gradation/Hydrometer Testing

To determine grain sizes of the sample retrieved from the infiltration bore hole at the test depth, gradation/hydrometer testing was performed on the sample. The results of the hydrometer portion of the tests are presented below:

BORE HOLE	DEPTH (feet)	SOIL CLASS	HYDROMETER RESULTS	
			GRAIN SIZE (millimeters)	PERCENT PASSING
I-1	5	ML	0.075 0.0553 0.0298 0.0199 0.0043 0.0022	89.1 85.5 74.0 66.1 41.0 31.1

3.3 Collapse-Consolidation Testing

To provide data for an analysis of potential settlement from structural loading, a one-dimensional consolidation test was performed on each of 3 representative samples of the subsurface silt/clay soils collected in the bore holes. The collapse 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-1	7.5	CL	15.6	90	250	-0.6%
B-2	5.0	CL	16.0	80	250	-2.0%
B-3	2.5	CL	11.5	98	250	+0.7%

The results of the tests indicate that the near-surface clay soils within about the upper 8 feet have slight to slightly moderate collapse potential. These soils typically exhibit a roothole/pinhole structure and have relatively low soil density. The sample from B-3 showed a slight potential to swell when wetted. Following the collapse portion of the test normal consolidation test loading was applied. The samples showed moderate to high compressibility characteristics under loading. Detailed results of the tests are maintained within our files and can be transmitted to you, at your request.

3.4 Compaction Testing

A bulk sample of the near surface Clay was obtained from bore hole B-8 at about 3 feet below the existing ground surface; a compaction test (as part of the California Bearing Ratio test) was performed on this sample. The results of the compaction test are presented in the table on the following page:

BORE HOLE	DEPTH (feet)	SOIL CLASS	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)
B-4	**3**	CL	**15.6**	111.0

3.5 California Bearing Ratio Testing

To determine subgrade support characteristics and to provide data for design of the proposed pavements, a CBR test was performed on the bulk sample described above in **Section 3.3 Compaction Test**. The results of the CBR test are presented below:

BORE HOLE	DEPTH (feet)	SOIL CLASS	MOISTURE CONTENT AT COMPACTION (%)	COMPACTED DRY DENSITY (pcf)	COMPACTION (%)	SWELL (%)	CBR VALUE @ 0.1/0.2
B-4	**3**	CL	17.7	107.6	96.9	1.3	5 / 9

3.6 Laboratory Vane Shear Testing

To determine the undrained shear strength of the soils encountered at the site, a laboratory vane shear test was performed. The results of the test are presented below:

BORE HOLE	DEPTH (feet)	SOIL CLASS	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	ULTIMATE SHEAR STRENGTH (psf)
B-2	20	CL	18.5	107	6,883

4.0 GEOLOGIC & SEISMIC CONDITIONS

4.1 Geologic Setting

The subject site is in the west portion of the Cedar Valley in north-central Utah and sits at an elevation of approximately 4,914 feet above sea level. The Cedar Valley, like the Salt Lake and Utah Valleys to the northeast and east, respectively, is a deep, sediment-filled basin that is part of the Basin and Range Physiographic Province. The valley was formed by extensional tectonic processes during the Tertiary and Quaternary geologic time periods. The valley is bordered by the Traverse Mountains and Lake Mountain on the east and the Southern Oquirrh Mountains and East Tintic Mountains on the west. The Cedar Valley is located within the Intermountain Seismic Belt, a zone of ongoing tectonism and seismic activity extending from southwestern Montana to southwestern Utah. However, unlike the Salt Lake and Utah Valleys, the Cedar Valley is not bound on one or both sides by any identified, active normal faults.

Much of northwestern Utah, including the Cedar Valley, was also previously covered by the Pleistocene age Lake Bonneville. The Great Salt Lake, located to the northwest of the valley, is a remnant of this ancient freshwater lake. Lake Bonneville reached a high-stand elevation of approximately 5,092 feet above sea level at between 18,500 and 17,400 years ago. Approximately 17,400 years ago, the lake breached its basin in southeastern Idaho and dropped by almost 300 feet relatively fast 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 level of the Great Salt Lake. 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 the Cedar Valley was deposited as lacustrine sediments during both the transgressive (rise) and regressive (fall) phases of Lake Bonneville.

The site lies on the boundary of two 7.5-minute geologic maps. The UGS Cedar Fort, Utah 7.5 Minute Quadrangle that was mapped by Biek[2], and the UGS Goshen Pass, Utah 7.5 Minute Quadrangle that was mapped by McKean[3]. The Cedar Fort quad covers the northern 1/3 and the Goshen Pass quad covers the southern 2/3 of the site. The surficial geology at the location of the subject site and adjacent properties is mapped as “Younger alluvial-fan deposits, undivided” (Map Unit Qafy) dated as upper Pleistocene. Unit Qafy is described in the referenced map as “Poorly to moderately sorted pebble to cobble gravel, with boulders near bedrock sources, with a matrix of sand, silt, and clay; gradational downslope into mixtures of sand, silt, and clay on gentler slopes; clasts subangular to well-rounded;... thickness unknown, but likely up to several tens of feet thick.” No fill has been mapped at the location of the site on the geologic map. Refer to **Exhibit 2 - Geologic Map**, shown on the following page.

4.2 Faulting

A cursory review of the referenced geologic map shows no active (Holocene-age) surface fault traces crossing, adjacent to, or projecting toward the subject site. The nearest mapped active fault is the West Eagle Hill fault, a strand of the Southern Oquirrh Mountains fault zone 5.0 miles to the west. Seismic design issues are addressed in **Section 4.3**.

[2]Biek, R.F., 2004, Geologic Map of the Cedar Fort 7.5’ Quadrangle, Utah County, Utah; Utah Geological Survey Map 202, Scale 1:24,000.
[3]McKean, A.P., 2020, Geologic Map of the Goshen Pass Quadrangle, Utah County, Utah. M-286DM. Utah Geological Survey. 1:24,000 scale.

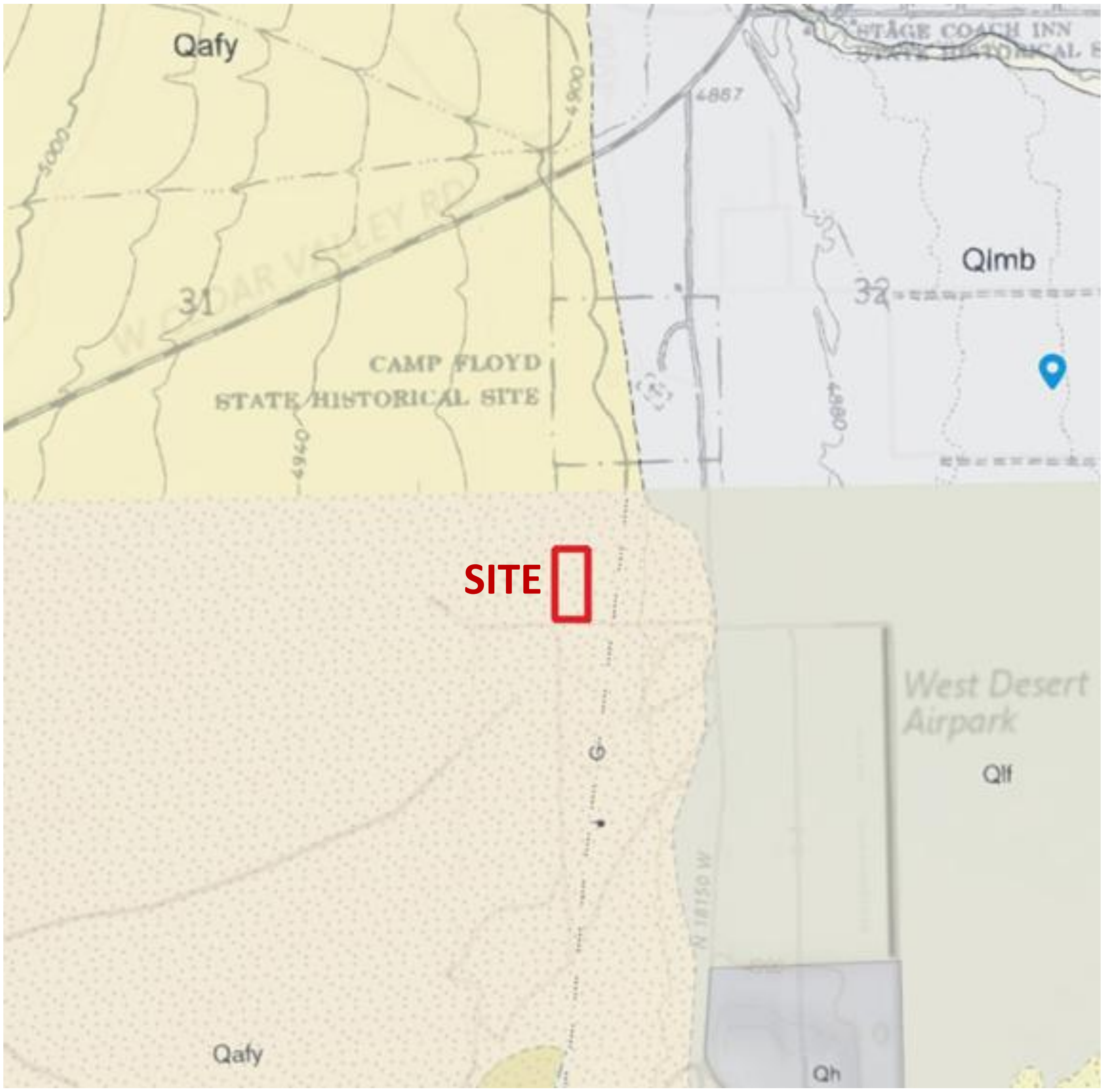


EXHIBIT 2 - GEOLOGIC MAP

4.3 Seismicity

4.3.1 Site Class

Utah has adopted the International Building Code (IBC) 2021, which determines the seismic hazard for a site based upon 2014 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available based on latitude and longitude coordinates (grid points). For site class definitions, IBC 2021 Section 1613.2.2 refers to Chapter 20, *Site Classification Procedure for Seismic Design*, of ASCE[4] 7, which stipulates that the weighted average values of shear wave velocity, blow count and/or shear strength within the upper 100 feet (30 meters) be utilized to determine seismic site class.

[4] American Society of Civil Engineers

Based on average shear wave velocity data within the upper 30 meters ($V_{S,30}$) published by McDonald and Ashland[5], the subject site is located within unit description Q02U, which has a log-mean $V_{S,30}$ of 964 meters per second (919 feet per second). Thus, it is our opinion the site best fits Site Class D – Stiff Soil (with data), which we recommend for seismic structural design.

4.3.2 Ground Motions

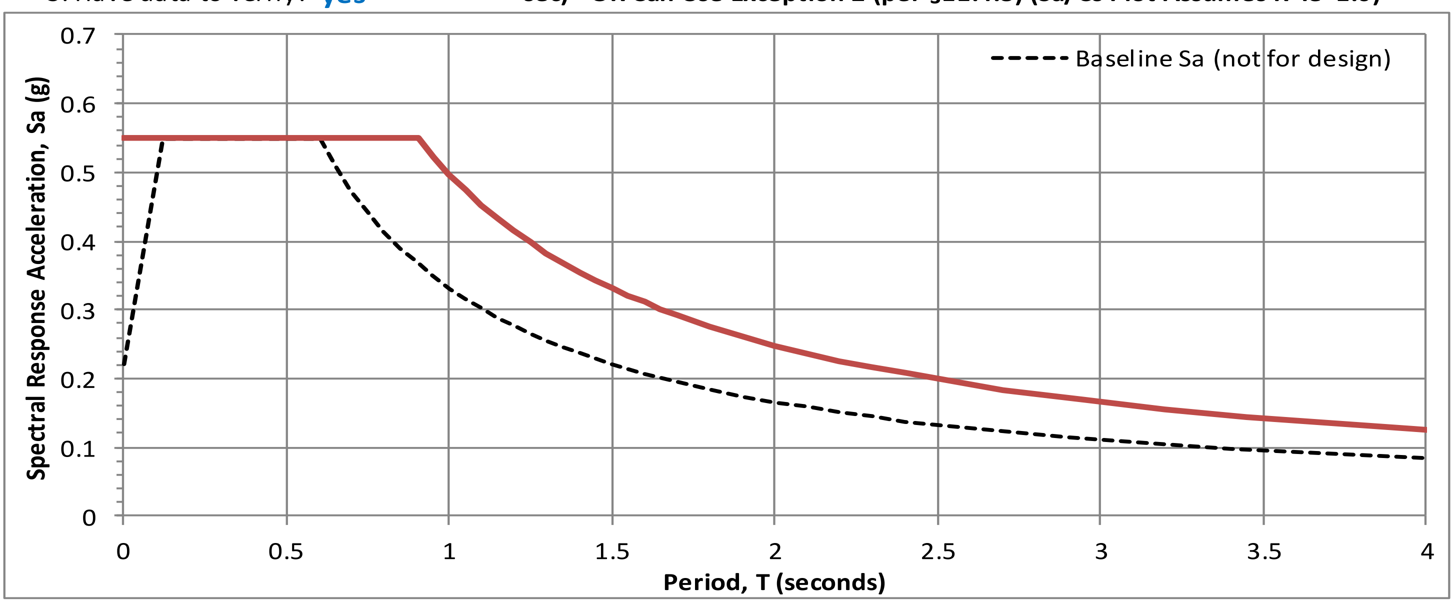
The 2014 USGS mapping utilized by the IBC provides values of peak ground, short period and long period spectral accelerations for the Site Class B/C boundary and the Risk-Targeted Maximum Considered Earthquake (MCE_R). This Site Class B/C boundary represents average bedrock values for the Western United States and must be corrected for local soil conditions. The table and response spectra below summarize the peak ground, short period and long period accelerations for the MCE_R event, and incorporates appropriate soil correction factors for a Site Class D (with data) soil profile at site grid coordinates of 40.2497 degrees north latitude and -112.1009 degrees west longitude:

SPECTRAL ACCELERATION PERIOD, T	SITE CLASS B/C BOUNDARY [mapped values] (g)	SITE COEFFICIENT	SITE CLASS D* [adjusted for site class effects] (g)	MULTI-PLIER	DESIGN VALUES (g)
Peak Ground Acceleration	PGA = **0.279**	F_{pga} = 1.321	PGA_M = 0.369	1.000	PGA_M = 0.369
0.2 Seconds (Long Period Acceleration)	S_S = **0.640**	F_a = 1.288	S_{MS} = 0.824	0.667	S_{DS} = 0.550
	(no exceptions needed)	F_a = (N/A)	S_{MS} = (N/A)	0.667	S_{DS} = (N/A)
1.0 Second (Long Period Acceleration)	S_1 = **0.233**	F_v = N/A	S_{M1} = N/A	0.667	S_{D1} = N/A
	(Exception 2:)	F_v = (2.134)	S_{M1} = (0.497)	0.667	S_{D1} = (0.331)

NOTES: 1. TL (seconds): **8**
2. Site Class: **D**
3. Have data to verify? **yes**

*** Site Class D (With Data)**

4. ASCE 7-16 Requires Site-Specific Ground Motion Hazard Analysis (Since S1≥0.2 sec) - OR Can Use Exception 2 (per §11.4.8) (Sa/Cs Plot Assumes R=Ie=1.0)



[5] McDonald, G.N. and Ashland, F.X., 2008, "Earthquake Site-Conditions Map for the Wasatch Front Urban Corridor, Utah," Utah Geological Survey Special Study 125, 41 pp.

As indicated in the table, S_1 is greater than 0.2 seconds and a site-specific ground motion hazard analysis (GMHA) is required for the site unless the Exception 2 values shown are used for seismic design. If a site-specific GMHA is desired instead of using the higher exception values for design, please contact CMT for a proposal to perform the GMHA.

4.3.3 Liquefaction

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.

The site is located within an area designated by the Utah Geologic Survey[6] as having “Moderate” liquefaction potential. This is defined as having between a 10% and 50% probability that within a 100-year period an earthquake strong enough to cause liquefaction will occur.

Groundwater was not encountered to the maximum depth explored of approximately 31.5 feet below the existing ground surface. In the absence of groundwater, liquefaction will not occur in the soils we encountered.

4.4 Other Geologic Hazards

No landslide deposits or features, including lateral spread deposits, are mapped on or adjacent to the site. The site is not located within a known or mapped potential stream flooding[7] or rock fall hazard area. There is a new feature on the UGS hazard website that shows flooding hazards and classifies the Qafy alluvial fan as a “moderate priority alluvial fan” according to J.E. Fuller Hydrology and Geomorphology Inc. It “poses a moderate potential risk to existing infrastructure and/or population areas” and the source is the Division of Emergency Management.

5.0 SITE CONDITIONS

5.1 Surface Conditions

The site is currently vacant range land vegetated with grasses, weeds, and brush. Site grade is relatively flat. Based upon aerial photos dating back to 1993 that are readily available on the internet, some grading and possible fill soil placement occurred in the northwest corner of the site around 2013. The existing paved cul-de-sac at the south end was constructed sometime between 2020 and 2022. The site is bordered on the north and west by similar vacant land, on the south by the paved cul-de-sac, and on the east by graded land (see **Vicinity Map** in **Section 1.1** above).

[6] 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

[7]https://msc.fema.gov/arcgis/rest/directories/arcgisjobs/nfhl_print/mscprintb_gpserver/j731e70b3a7564ba29e8729f76be5c317/scratch/FIRMETTE_8f005da6-f18b-4099-ac1c-63011116c3c5.pdf

5.2 Subsurface Soils

At the locations of the bore holes we encountered approximately 4 inches of topsoil at the surface. We encountered natural soils beneath the topsoil predominately consisting of slightly moist to moist brown Lean CLAY (CL) with varying amounts of sand and gravel, extending to the bottom of bore holes B-1, B-2, B-4, B-5, B-7, and B-9, at depths of approximately 6.5 to 31.5 feet below the surface. Based upon the blow counts, the clay soils are of soft to hard consistency. The clay soils in the upper approximately 8 feet showed moisture sensitivity mostly in the form of additional settlement (collapse) upon wetting.

In bore hole B-3 below the clay at approximately 5 feet below the surface, and in B-6 below the clay at approximately 10.5 feet below the surface, layers of natural moist, brown Silty SAND (SM) with gravel were encountered extending to the bottom of these bore holes at approximately 16.5 and 11.5 feet below the existing ground surface, respectively. Based upon the blow counts the sands soils are in a medium dense to very dense state. In bore hole B-8, below the clay at approximately 5 feet below the surface a layer of moist, brown Silty GRAVEL (GM) with sand was encountered extending to the bottom of B-8 at approximately 6.5 feet below the surface. The gravel was in a very dense state based upon the blow count.

For a more descriptive interpretation of subsurface conditions, please refer to the bore hole logs, ***Figures 2 through 5***, 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 not encountered at the time of our field explorations to the maximum depth explored of approximately 31.5 feet below the existing ground surface. We do not anticipate that groundwater will be encountered during 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 when interpolating or extrapolating subsurface conditions between or beyond the exploratory locations.

Undocumented fill could be encountered in the northwest corner of the site, and topsoil was encountered in the bore holes. These soils should be expected to vary in extent and depth throughout the site.

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 vegetation, topsoil, loose and disturbed soils, etc. Based upon the conditions observed in the bore holes there is topsoil on the surface of the site which we estimated to be about 4 inches in thickness. When stripping and grubbing, topsoil should be distinguished by the apparent organic content and not solely by color; thus we estimate that topsoil stripping will need to include the upper 4 inches.

Following stripping, clearing and/or grubbing, the subgrade should be observed by a CMT geotechnical engineer to assess that suitable natural soils have been exposed and any deleterious materials, loose and/or disturbed soils have been removed, prior to placing 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.

6.2 Temporary Excavations

Excavations deeper than 8 feet are not anticipated at the site. Groundwater was not encountered within the depths explored, approximately 11.5 to 31.5 feet at the time of our field explorations and thus is not anticipated to be encountered in excavations.

The natural soils encountered at this site predominantly consisted of clay. In clayey (cohesive) soils, temporary construction excavations not exceeding 4 feet in depth may be constructed with near-vertical side slopes. Temporary excavations up to 8 feet deep, above or below groundwater, may be constructed with side slopes no steeper than one-half horizontal to one vertical (0.5H:1V).

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.

To reduce disturbance of the natural soils during excavation, we recommend that smooth edge buckets/blades be utilized.

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 structural fill must be free of sod, rubbish, topsoil, frozen soil, and other deleterious materials. Following are our recommendations for the various fill types we anticipate will be used at this site:

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 minimum 15% passing and a maximum 35% passing the No. 200 sieve, and a maximum Plasticity Index of 10.
Imported 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, 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**).

Natural clay soils are not suitable for use as structural fill or site grading fill but may be used as non-structural fill. Note that these clay soils will be inherently more difficult to work with in proper moisture conditioning (they are very sensitive to changes in moisture content), requiring very close moisture control during placement and compaction. This will be very difficult, if not impossible, during wet and cold periods of the year.

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:

[8] American Association of State Highway and Transportation Officials

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. Above the bedding zone, we recommend that utility trench backfill have a minimum 20% fines, to reduce permeability (refer to **Section 6.3** above). In addition, utilities should be installed as close to the bottom of the potentially collapsible soils as reasonably possible (approximately 8 feet).

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).

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**.

6.6 Stabilization

The natural 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

[9] American Public Works Association

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.

7.1 Continuous/Isolated Footings

Based on our geotechnical engineering analyses, the proposed structure(s) may be supported upon conventional isolated and/or continuous wall foundations placed on a minimum of 18 inches of structural fill meeting the specifications given in **Section 6.3**. Footings may be designed using a net bearing pressure of 2,000 psf.

The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above lowest adjacent final grade, thus the weight of the footing and backfill to lowest adjacent final grade need not be considered. The allowable bearing pressure may be increased by 1/3 for temporary loads such as wind and seismic forces.

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. Isolated footings should be a minimum of 24 inches wide.

7.2 Installation

Under no circumstances shall foundations be placed directly on potentially collapsible soils, on undocumented fill, topsoil with organics, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. If unsuitable soils are encountered, they must be completely removed and replaced with properly compacted structural fill.

Deep, large roots may be encountered where larger bushes are located or were previously located at the site; such large roots should be removed. The base of footing excavations should be observed by a CMT geotechnical engineer to assess that suitable 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.

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 the maximum depth of structural fill 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.

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 0.40 for structural fill may be utilized for design. Passive resistance provided by properly placed and compacted natural clay soils above the water table may be considered equivalent to a fluid with a density of 325 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 natural clay soils 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. Following are the recommended lateral pressure values, 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. For subgrade walls 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)	38	12
At-Rest Pressure (wall is not allowed to yield)	58	N/A
Passive Pressure (wall moves into the soil)	325	135

*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, compacted bearing soils comprised of suitable, undisturbed uniform natural soils or on structural fill extending to suitable 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 clay soils are potentially collapsible 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 each 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.

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

All pavement areas must be prepared as discussed above in **Section 6.1**. Under no circumstances shall pavements be established over topsoil, undocumented fills (if encountered), loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

In roadway areas, subsequent to stripping and prior to the placement of pavement materials, the exposed subgrade must be proof rolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or otherwise unsuitable soils are encountered, we recommend they be removed to a minimum of 18 inches below the subgrade level and replaced with structural fill.

[10] American Concrete Institute

We anticipate the natural clay soils will exhibit poor pavement support characteristics when saturated or nearly saturated. To provide data to aid in pavement design a California Bearing Ratio (CBR) test was performed on a bulk sample of the near surface soils from the site. Results, as presented in Section 3.5, indicate a CBR value of 5:

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 (1 ESAL per day)		DRIVE AREAS (3 ESAL'S per day)	
Asphalt	**3**	**3**	**3.5**	**3.5**
Road-Base (UTBC)	**8**	**4**	**10**	**6**
Subbase	**0**	**6**	**0**	**6**
Total Thickness	**11**	**13**	**13.5**	**15.5**

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 suitable natural subgrade or site grading structural fills extending to suitable 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

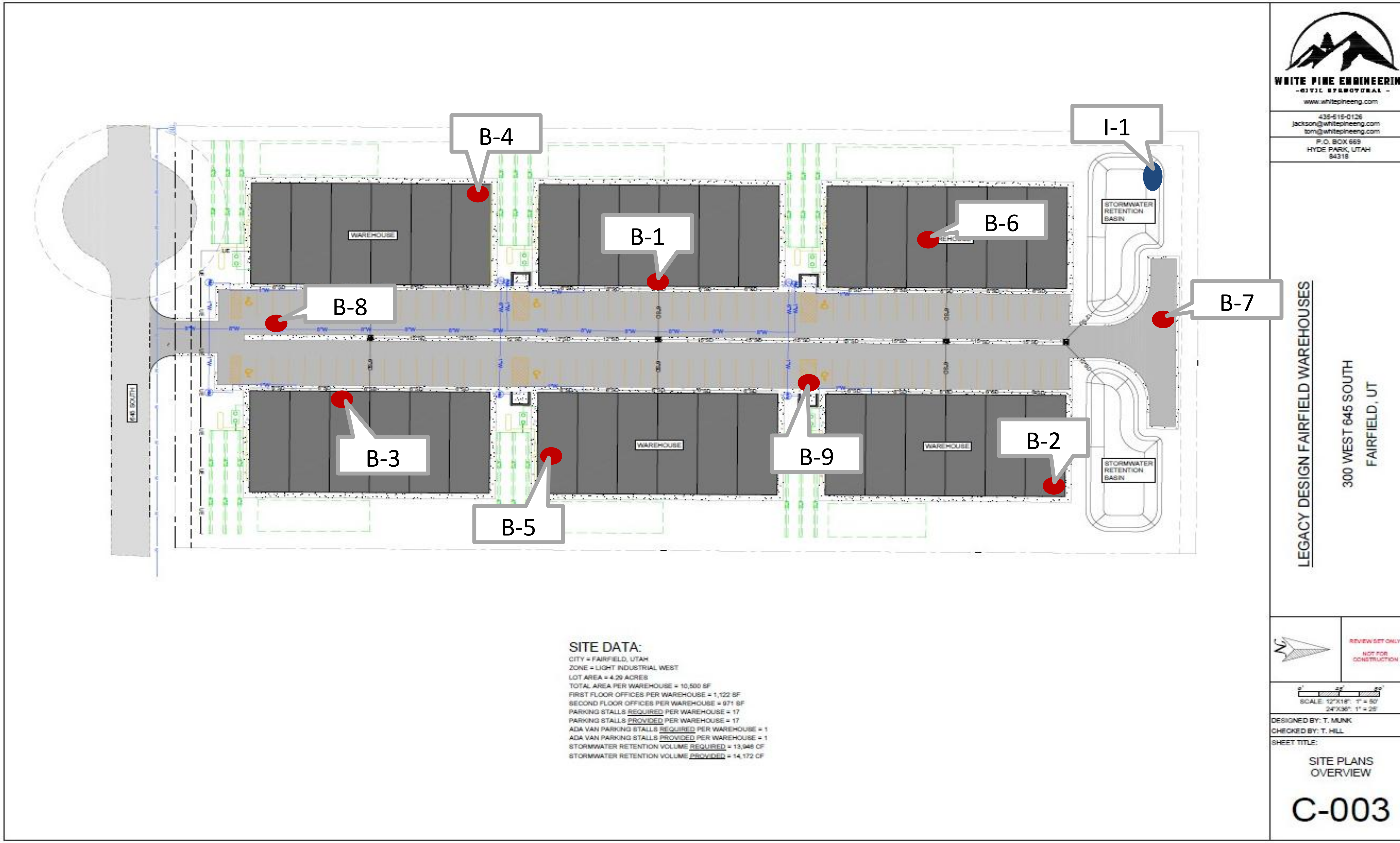
The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground 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



CMT TECHNICAL SERVICES	Beyond Welding and Metal Fabrication 428 West 645 South, Fairfield, Utah	Bore Hole Locations	Date:	27-Aug-2025	Figure:
			CMT No.:	25086	1

Beyond Welding and Metal Fabrication — Bore Hole Log — B-1

428 W 645 S, Fairfield, UT

Total Depth: 31.5'
Water Depth: (see Remarks)

Date: 8/21/25
Job #: 25086

Depth (ft)	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0	Brown Lean CLAY (CL), trace sand, with calcium, moist												
	medium stiff		1	4 3 3	6	18				97			
4													
			2	3 3 3	6								
8	grades some sand, with pinholes — soft		3	4 4 4	8	16	90			91	33	17	16
			4	2 1 2	3								
12													
16	very stiff		5	10 10 9	19	12				90	27	15	12
20	grades with roots and oxidation — stiff		6	6 8 12	20								
24													
			7	5 4 5	9	17				92			
28													

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.249719°, -112.0010338°
Surface Elev. (approx): Not Given

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

CMT TECHNICAL SERVICES

Figure: 2

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log

B-1

Total Depth: 31.5'
Water Depth: (see Remarks)

Date: 8/21/25
Job #: 25086

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
28		Brown Lean CLAY (CL), some sand, moist												
		stiff		8	4 6 6	12								
32		END AT 31.5'												
36														
40														
44														
48														
52														
56														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.249719°, -112.0010338°
Surface Elev. (approx): Not Given

CMT TECHNICAL SERVICES

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

Figure:
2

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log

B-2

Total Depth: 21.5'
Water Depth: (see Remarks)

Date: 8/21/25
Job #: 25086

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Lean CLAY (CL) with roots, moist												
		medium stiff		9	4 3 3	6								
4														
		grades some sand, pinholes and calcium soft		10	4 2 3	5	16	80			87			
8		stiff		11	3 3 6	9	12		8	23	69			
		medium stiff		12	6 9 9	18								
12														
16		stiff		13	7 5 4	9								
20		grades with pinholes		14	5 10 16	26	18	107			95			
		END AT 21.5'												
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.2504158°, -112.1005094°
Surface Elev. (approx): Not Given

CMT TECHNICAL SERVICES

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

Figure: 3

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log — B-3

Total Depth: 16.5'
Water Depth: (see Remarks)

Date: 8/21/25
Job #: 25086

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Lean CLAY (CL) with gravel, pinholes and roots, moist												
		stiff		15	17 17 16	33	11	98	1	20	79			
4														
		Brown Silty SAND (SM) with gravel, moist — very dense		16	21 32 33	65	4		25	45	30			
8		dense		17	16 20 14	34								
				18	13 17 16	33	4		31	49	20			
12														
16		medium dense		19	8 13 11	24								
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

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

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

CMT TECHNICAL SERVICES

Figure: 4

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log B-4

Total Depth: 16.5'
Water Depth: (see Remarks)

Date: 8/21/25
Job #: 25086

Depth (ft)	Soil Description	Sample Type	Sample #	Blows (N)	Blows Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0	Brown Lean CLAY (CL) with sand, trace gravel, moist												
	stiff		20	5 7 7	14	10				86	37	16	21
	grades with roots; very stiff		21	9 10 14	24								
			22	11 12 11	23								
			23	7 8 9	17								
	medium stiff		24	5 6 9	15	12	94			94	28	15	13
16.5	END AT 16.5'												

Remarks: Groundwater not encountered during drilling.

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

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

CMT TECHNICAL SERVICES

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log B-5

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

Date: 8/21/25
Job #: 25086

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Lean CLAY (CL) with calcium, moist												
		stiff		25	6 7 6	13								
4														
		medium stiff		26	4 3 3	6								
8				27	4 4 7	11								
		soft to medium stiff		28	3 2 2	4	5	107	37	34	29			
12		END AT 11.5'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

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

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

CMT TECHNICAL SERVICES

Figure: 6

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log B-6

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

Date: 8/21/25
Job #: 25086

Depth (ft)	GRAPHIC LOG	Soil Description		Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Lean CLAY (CL), moist													
			stiff		29	5 6 4	10								
4															
					30	6 6 8	14								
8		grades with sand and oxidation	hard		31	10 17 17	34								
		grades some gravel , roots and pinholes													
		Brown Silty SAND (SM) with gravel, moist	medium dense		32	16 14 15	29								
		END AT 11.5'													
12															
16															
20															
24															
28															

Gradation: Gravel %, Sand %, Fines %. Atterberg: LL, PL, PI.

Remarks: Groundwater not encountered during drilling.

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

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

CMT TECHNICAL SERVICES

Figure: 7

Beyond Welding and Metal Fabrication

Bore Hole Log B-7

428 W 645 S, Fairfield, UT

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

Date: 8/21/25
Job #: 25086

Depth (ft)	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0	Brown Lean CLAY (CL), some sand, moist												
	stiff		33	6 5 7	12	7				94	32	18	14
4													
	grades with calcium; hard		34	8 16 18	34								
8	grades with roots; stiff		35	10 15 18	33	12	113			90			
	stiff to very stiff		36	7 8 8	16								
12	END AT 11.5'												
16													
20													
24													
28													

Remarks: Groundwater not encountered during drilling.

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

CMT TECHNICAL SERVICES

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

Figure: 8

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log B-8

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

Date: 8/21/25
Job #: 25086

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		Brown Lean CLAY (CL), some sand, trace gravel, slightly moist												
		very stiff		37	9 9 8	17	3		1	7	92	33	17	16
4														
		Brown Silty GRAVEL (GM) with sand, moist — very dense		38	6 27 40	67								
		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

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Spencer Moon

CMT TECHNICAL SERVICES

Figure: 9

Beyond Welding and Metal Fabrication

428 W 645 S, Fairfield, UT

Bore Hole Log — B-9

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

Date: 8/21/25
Job #: 25086

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Lean CLAY (CL), some sand and roots, moist												
		stiff		39	4 8 10	18	17	84			93			
4														
		stiff to very stiff		40	5 8 8	16								
		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
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Spencer Moon

Figure: 10

CMT TECHNICAL SERVICES

Beyond Welding and Metal Fabrication

Key to Symbols

428 W 645 S, Fairfield, UT

Date: 8/21/25

Job #: 25086

① Depth (ft)	② GRAPHIC LOG	③ Soil Description	④ Sample Type	⑤ Sample #	Blows(N) ⑥	⑦ Total	⑧ Moisture (%)	⑨ Dry Density(pcf)	Gradation ⑩ Gravel %	Sand %	Fines %	Atterberg ⑪ LL	PL	PI

COLUMN DESCRIPTIONS

① **Depth (ft.):** Depth (feet) below the ground surface (including groundwater depth - see below right).

② **Graphic Log:** Graphic depicting type of soil encountered (see ② below).

③ **Soil Description:** Description of soils, including Unified Soil Classification Symbol (see below).

④ **Sample Type:** Type of soil sample collected; sampler symbols are explained below-right.

⑤ **Sample #:** Consecutive numbering of soil samples collected during field exploration.

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

⑦ **Total Blows:** Number of blows to advance sampler the 2nd and 3rd 6" increments.

⑧ **Moisture (%):** Water content of soil sample measured in laboratory (percentage of dry weight).

⑨ **Dry Density (pcf):** The dry density of a soil measured in laboratory (pounds per cubic foot).

⑩ **Gradation:** Percentages of Gravel, Sand and Fines (Silt/Clay), from lab test results of soil passing No. 4 and No. 200 sieves.

⑪ **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	②	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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