When Recorded Mail To:
American Fork City
51 East Main
American Fork UT 84003

ENT102038:2025 PG 1 of 63
ANDREA ALLEN
UTAH COUNTY RECORDER
2025 Dec 30 12:36 PM FEE 196.00 BY MG
RECORDED FOR AMERICAN FORK CITY

AMENDED AND RESTATED NOTICE OF INTEREST, BUILDING REQUIREMENTS, AND ESTABLISHMENT OF RESTRICTIVE COVENANTS

This Amended and Restated Notice of Interest, Building Requirements, and Establishment of Restrictive Covenants is recorded pursuant to American Fork City Code Ordinance 07-10-47, Section 6-5 Restrictive Covenant Required and Section 6-2-4, Liquifiable Soils. It replaces and supersedes in full the Notice of Interest recorded on August 6, 2020, as Entry No. 115310:2020, Utah County Recorder. This Notice is recorded to bind the attached Geotechnical Study dated July 23, 2025 and all subsequent geotechnical updates as outlined below as part of Exhibit B along with the site grading plan (Exhibit C) to the property generally located at 1140 West 480 South known as Edgewater Townhomes at American Fork Plats 7 and 8, American Fork, UT 84003 and therefore mandating that all construction be in compliance with said Geotechnical Study and site grading plan per the requirements of American Fork City ordinances and standards and specification including specifically Ordinance 07-10-47, Section 6-5, Restrictive Covenant Required and 6-2-4, Liquefiable Soils. Said Sections require establishment of a restrictive covenant and notice to property owners of liquefiable soils or other unique soil conditions and construction methods associated with the property. The maximum allowed height of any crawl spaces within these plats shall be four feet or less.

Exhibit A – Legal Description of Property

- Edgewater Townhomes at American Fork Plat 7 (pg. 3)
- Edgewater Townhomes at American Fork Plat 8 (pg. 3)

Exhibit B – Geotechnical Study

- Geotechnical Engineering Study Edgewater Townhomes – CMT Technical Services July 23, 2025 (pg. 4 - 62)

Exhibit C – Site Grading Plan

- MW Brown Engineering Inc. Edgewater Townhomes Phase 3 Grading Plan (pg. 63)

Dated this 15th day of September, 2025.

OWNER(S):

(Signature) (Signature)

Todd Baker
(Printed Name) (Printed Name)

Vice President

(Title) Century Land Holdings of Utah LLC (Title)

STATE OF ~~UTAH~~ Colorado)
§
COUNTY OF Arapahoe)

On the 15th day of September, 2025, personally appeared before me Todd Baker and _____, Owner(s) of said Property, as (individuals and/or authorized representatives of a company), and acknowledged to me that such individuals or company executed the within instrument freely of their own volition and pursuant to the articles of organization where applicable.

Notary Public
My Commission Expires: 5·2·2028

AMY L WARD
NOTARY PUBLIC - STATE OF COLORADO
NOTARY ID 20084015606
MY COMMISSION EXPIRES MAY 2, 2028

EXHIBIT "A" -
LEGAL DESCRIPTION OF PROPERTY

Edgewater Townhomes at American Fork Plat 7 Legal Description

Lot 243 Through 296, EDGEWATER TOWNHOMES AT AMERICAN FORK PLAT 7, according to the official plat thereof, on file and of record in the office of the Utah County Recorder, State of Utah.

Edgewater Townhomes at American Fork Plat 8 Legal Description

Lot 297 Through 330, EDGEWATER TOWNHOMES AT AMERICAN FORK PLAT 8, according to the official plat thereof, on file and of record in the office of the Utah County Recorder, State of Utah.

EXHIBIT "B" -
GEOTECHNICAL STUDY

[see pg. 5-62]

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

GEOTECHNICAL ENGINEERING STUDY (REVISION No. 1)

Edgewater Townhomes

About 480 South 1140 West
American Fork, Utah

CMT PROJECT NO. 23522

FOR:
Century Communities
10644 South Jordan Gateway, Suite 300
South Jordan, Utah 84095

July 23, 2025

July 23, 2025

Mr. Braden Cooper
Century Communities
10644 South Jordan Gateway, Suite 300
South Jordan, Utah 84095

Subject: Geotechnical Engineering Study (Revision No. 1)
Edgewater Townhomes
About 480 South 1140 West
American Fork, Utah
CMT Project Number: 23522

Mr. Cooper:

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, and has been revised to address review comments by American Fork City representatives.

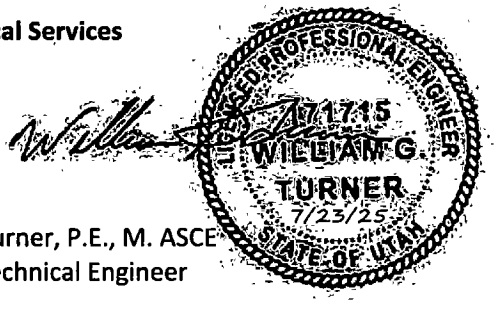
On December 12 and 13, 2024, a CMT staff professional was on-site and observed the drilling of 15 bore holes extending to depths of about 16.5 to 70 feet below the existing ground surface. Soil samples were obtained during the field operations and subsequently transported to our laboratory for further testing and observation.

Conventional isolated and/or continuous footings may be utilized to support the proposed buildings, 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 801-492-4132.

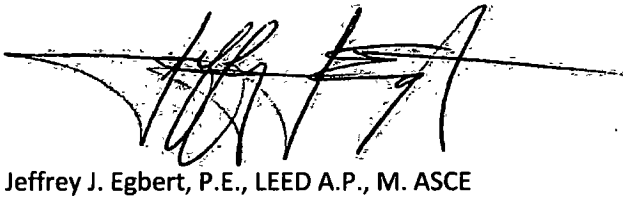
CERTIFICATE: We hereby certify that we are licensed professional engineers, as defined in the "Sensitive Lands Ordinance" Section of the American Fork City Ordinances. We have examined the report to which this certificate is attached and the information and conclusions contained therein are, without any reasonable reservation not stated therein, accurate and complete. The procedures and tests used in said report meet minimum applicable professional standards.

Sincerely,
CMT Technical Services



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

Reviewed by:



Jeffrey J. Egbert, P.E., LEED A.P., 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 townhomes to be located at the southwest corner of 480 South and 1100 West in American Fork, 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 among Mr. Braden Cooper and Mr. Toby Cordova of Century Communities, and Mr. Bill Turner 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, 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 15 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 November 12, 2024, and executed on November 13, 2024.

1.3 Description of Proposed Construction

We understand that the proposed construction consists of 15 townhomes buildings on the site that will be 2 to 3 stories in height and will have crawl spaces. We project that maximum structural loads will be on the order of 8,000 pounds per linear foot for walls and 150,000 pounds for columns. 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.

Site development will require some earthwork in the form of minor cutting and filling for each building. 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 2.5 to 9.5 feet of undocumented fill blankets the site; foundations should not be placed on undocumented fill.
2. Subsurface soils encountered below the undocumented fill predominantly consisted of CLAY (CL) within the upper 30 feet and both CLAY (CL) and SAND (SC) soils below 30 feet, extending to the maximum depth explored of 70 feet below the existing ground surface.
3. Groundwater was encountered only within the deeper bore hole (B-9) at a depth of about 27 feet, and thus is not likely to affect excavations and construction.
4. Foundations may be constructed on suitable undisturbed natural soils or on structural/engineered fill which extends to natural soils.

CMT must assess that topsoil, undocumented fills, debris, disturbed or unsuitable soils have been removed and that suitable soils have been encountered prior to placing site grading fills and footings. In the following sections, detailed discussions pertaining to the site are provided, including subsurface descriptions, geologic setting, seismicity, earthwork, foundations, lateral resistance and lateral pressures.

2.0 FIELD EXPLORATION

To define and evaluate the subsurface soil and groundwater conditions, 15 bore holes were drilled at the site to depths of approximately 16.5 to 70 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 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 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 16***, 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 17*** in the Appendix.

Following completion of drilling operations, the bore holes were backfilled with auger cuttings.

3.0 LABORATORY TESTING

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

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 clay soils collected in the bore holes. Based upon data obtained from the consolidation testing, the clay soils at this site are moderately over-consolidated, moderately compressible under additional loading, and have a swell potential of approximately 0.5% to 1.5% at a load of 1,000 psf when water was added (see the **Lab Summary Table** below). Graphical results of the consolidation tests are provided in the Appendix..

Laboratory test results are presented on the bore hole logs (***Figures 2 through 16***) and in the following **Lab Summary Table**:

[1] American Society for Testing and Materials

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	7.5	CL	SPT	36		0	8	92				
B-2	7.5	CH	Rings	28	93				60	20	40	+1.5%
B-3	7.5	CL	SPT	27		1	4	95				
B-4	10	CL	SPT	22		0	16	84				
B-5	2.5	FILL: GC	SPT	11		30	22	48				
B-6	5	FILL: GM	Rings	22	100							
	7.5	CL	SPT	29		3	7	90				
B-7	7.5	CL	SPT	22		16	8	76				
B-8	2.5	FILL: CL	SPT	17		10	14	76				
B-9	20	CH	SPT	41		0	1	99	51	21	30	
	30	ML	SPT	26		0	48	52				
	35	ML	SPT	25		0	30	70	19	17	2	
	40	CL-ML	SPT	24		0	35	65	22	17	5	
	45	CL	SPT	21		0	11	89				
	55	CL	SPT	38		0	2	98				
B-10	7.5	CL	Rings	24	89	2	16	82				
B-11	5	CL	SPT	28		0	6	94				
B-12	15	CL	Rings	21	108				30	20	10	< -0.5%
B-13	5	CL	SPT	30		3	17	80				
B-14	5	CH	Rings	30	91				57	25	32	+0.5%
B-15	5	CL	SPT	17		11	17	72				

4.0 GEOLOGIC & SEISMIC CONDITIONS

4.1 Geologic Setting

The subject site is located in the north-central portion of Utah Valley in north-central Utah at an elevation of approximately 4,705 feet above sea level. Utah Valley 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, and 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 past 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 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 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.

The geology of the USGS 7.5 Pelican Point, Utah Quadrangle, including the location of the subject site, has been mapped by Biek[2]. The surficial geology of the subject site and adjacent properties is mapped as "Lacustrine silt and clay" (Map Unit Qlmp) dated to be upper Pleistocene. Unit Qlmp is described in the mapping as "Calcareous silt (marl) and clay with minor fine sand; typically laminated or thin bedded; ostracodes locally common; deposited in quiet water in moderately deep parts of the Bonneville basin and in sheltered bays; overlies lacustrine silt and clay of the transgressive phase and grades upslope into lacustrine sand and silt (Qlsp); locally buried by loess veneer; regressive lacustrine shorelines typically poorly developed; extensive exposure within two miles (3 km) of the Utah Lake shore incised by young alluvial fans (Qafy), and small remnants south of Pelican Point. Exposed thickness less than 15 feet (5 m), but total thickness may exceed several tens of feet.". 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.

[2] Biek, R.F., 2005, Geologic Map of the Lehi Quadrangle and Part of the Timpanogos Cave Quadrangle, Salt Lake and Utah Counties, Utah; Utah Geological Survey Map 210, Scale 1:24,000.

EXHIBIT 2 - GEOLOGIC MAP

4.2 Faulting

No surface fault traces are shown on the referenced geologic map crossing or projecting toward the subject site. The nearest mapped active (Holocene-age) fault trace is the Provo segment of the Wasatch fault located about 5.2 miles east-northeast of the site. 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) 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[3] 7, which stipulates that the

[3] American Society of Civil Engineers

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. Based on the blow counts obtained in bore hole B-9 which extended to the maximum depth explored of 70 feet and considering that similar soils are anticipated to a depth of 100 feet, the site best fits Site Class E – Soft Clay Soil, which we recommend for seismic structural design. Note that liquefaction of deeper silty soils (at least 30 feet deep) could occur at the site, but we anticipate that less than 1 inch of liquefaction-induced settlement will occur at the ground surface and, thus, the site does not need to be classified as Site Class F.

4.3.2 Ground Motions

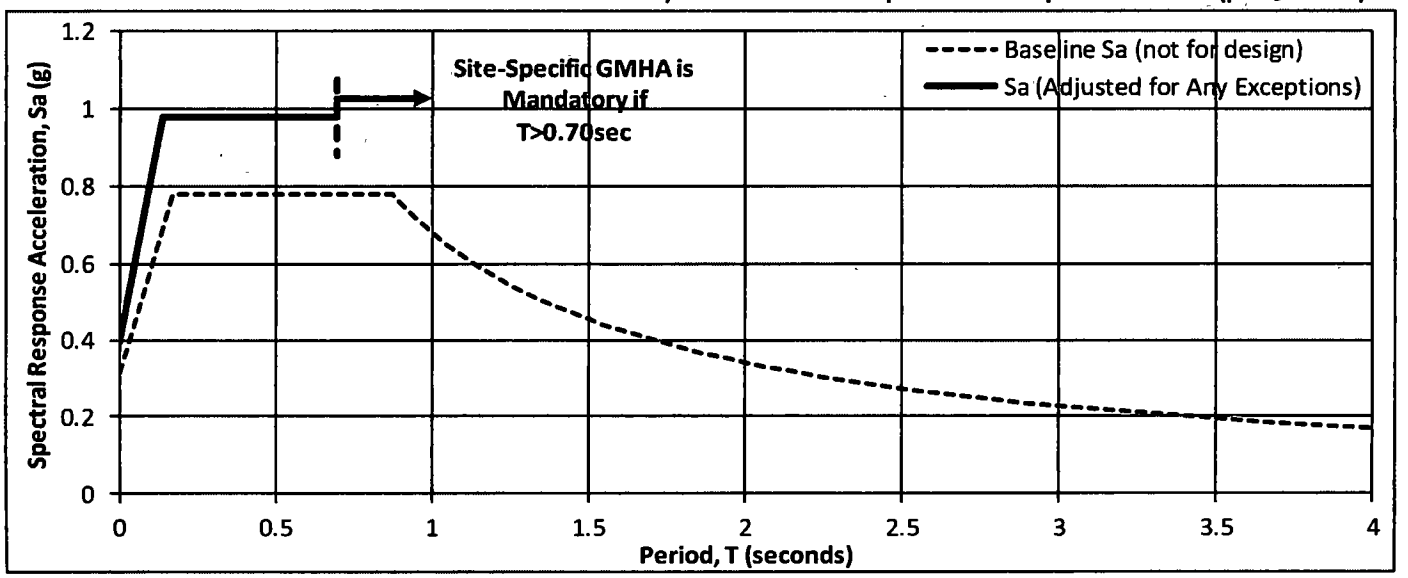
The 2014 USGS mapping utilized by the IBC provides values of peak ground, short period and long period spectral accelerations for the Site Class B/C boundary and the Risk-Targeted Maximum Considered Earthquake (MCE_R). This Site Class B/C boundary represents average bedrock values for the Western United States and must be corrected for local soil conditions at site grid coordinates of 40.3671 degrees north latitude and -111.8275 degrees west longitude. The following table and response spectra 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 E soil profile:

SPECTRAL ACCELERATION PERIOD, T	SITE CLASS B/C BOUNDARY [mapped values] (g)	SITE COEFFICIENT	SITE CLASS E [adjusted for site class effects] (g)	MULTI-PLIER	DESIGN VALUES (g)
Peak Ground Acceleration	PGA = **0.544**	F_{pga} = 1.156	PGA_M = 0.629	1.000	PGA_M = 0.629
0.2 Seconds (Long Period Acceleration)	S_S = **1.220**	F_a = N/A	S_{MS} = N/A	0.667	S_{DS} = N/A
	(Exception 1:)	F_a = (1.200)	S_{MS} = (1.464)	0.667	S_{DS} = (0.976)
1.0 Second (Long Period Acceleration)	S_1 = **0.440**	F_v = N/A	S_{M1} = N/A	0.667	S_{D1} = N/A
	(Exception 3:)	F_v = (2.320)	S_{M1} = (1.021)	0.667	S_{D1} = (0.681)

NOTES: 1. TL (seconds): **8** *** Site Class E**

2. Site Class: **E**

4. ASCE 7-16 Requires Site-Specific Ground Motion Hazard Analysis (Since Ss≥1.0 & S1 ≥ 0.2 sec) - OR Can Use Exceptions 1 & 3 up to T=0.70sec (per §11.4.8)



As shown in the response spectrum above, if the period of the proposed building is greater than 0.70 seconds, a site-specific ground motion hazard analysis (GMHA) is required. The structural engineer, Kaytlin Blanco of York Engineering, confirmed via an email (attached) that the fundamental period of the buildings is 0.22 seconds. Thus, a site response analysis is not needed for this site.

4.3.3 Liquefaction

The site is located within an area designated by the Utah Geologic Survey[4] as having "High" liquefaction potential and is within the American Fork City's Sensitive Land Ordinance for 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.

Subsurface soils encountered consisted of clayey soils with plasticity indices greater than 12 or clay content greater than 20% (typically considered not liquefiable – see ***Figure 18***, attached), and loose to medium dense sandy soils, beneath the encountered depth of groundwater (27 feet below the existing ground surface at B-9). However, oxidation and reddish colorations were observed as shallow as 3.5 to 4 feet below the encountered fill soils, which suggests that the past groundwater was likely at those levels (see discussion below in **Section 5.3**) and, thus, we used a groundwater level of 10 feet (given the 6.5 feet of fill) within B-9 for the liquefaction analysis.

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 deposits. Our evaluation indicates the layer of saturated silty soils could liquefy between depths of about 30 to 35 and 40 to 45 feet during a major seismic event. Maximum anticipated settlement resulting from the liquefaction is in the range of 1.6 to 2.4 inches at the top of the liquefiable soil layers, while lateral spreading due to liquefaction is not anticipated to occur (calculations are attached). However, using the boundary curves provided by Ishihara[7] for identifying when liquefaction-induced damage would occur at the surface, it is our opinion that less than 1 inch of liquefaction-induced settlement will occur at the ground surface (see attached). Thus, it is our opinion that liquefaction mitigation is not needed for this site.

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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.

[7] Ishihara, K., 1985, Stability of Natural Deposits During Earthquakes, International Society for Soil Mechanics and Geotechnical Engineering, pp 321-376.

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 currently known or mapped potential debris flow, stream flooding, or rock fall hazard area.

5.0 SITE CONDITIONS

5.1 Surface Conditions

The site is currently developed with streets and utilities in place. Overall, the site is relatively flat, with a very slight slope downward to the south. Based upon aerial photos dating back to 1993 that are readily available on the internet, the site was previously used for agriculture, with grading beginning to occur between 2020 and 2021 and the existing streets placed between 2023 and 2024. The site is bordered on the north by 480 South Street and an existing residential development, on the east 1100 West Street and an existing residential development, and on the south and west by undeveloped land (see **Vicinity Map** in **Section 1.1** above).

5.2 Subsurface Soils

At the locations of the bore holes, we encountered approximately 2.5 to 9.5 feet of fill soils, which consisted of silty/clayey gravel to gravelly/sandy clay; these soils are considered undocumented/untested/non-engineered. We encountered natural soils beneath the fill soils, consisting of Silty CLAY (CL) extending to a depth of about 30 feet below the surface. Clayey SAND (SC) was encountered below the clay extending to a depth of about 40 feet, followed by more clay soils extending to the maximum depth penetrated of approximately 70 feet.

The clay soils were moist to wet, brown to reddish brown/gray to gray in color, and very soft to stiff in consistency.

The natural sand soils were wet, dark gray to gray in color, and loose to medium dense based on the blow counts in the bore holes.

For a more descriptive interpretation of subsurface conditions, please refer to the bore hole logs, ***Figures 2 through 16***, 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 only encountered in the deeper bore hole (B-9) at a depth of about 27 feet below existing grade at the time of our field exploration. Signs of past groundwater levels, such as oxidation, reddish/rust colorations, etc., were observed in many of the bore holes at depths as shallow as 7.5 feet (3.5 to 4 feet below existing fill/the original ground surface). Thus, it is our opinion that the historic high groundwater level for the site is about 3.5 to 4 feet below the pre-filled ground surface.

CMT drilled bore hole B-9 to a depth of about 70 feet; at the bottom of the bore hole, CMT field personnel noted that a little artesian pressure was observed at that depth, but the pressure dissipated quickly and did not rise more than a few feet into the augers. In addition, no other artesian conditions were observed within the other bore holes. These conditions indicate that there are no artesian pressures at/near the surface of this site.

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. Note that 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 2.5 to 9.5 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 can then be re-placed 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 suitable natural soils have been exposed and any deleterious materials, loose and/or disturbed soils have been removed, prior to placing site grading fills and footings.

Fill placed over large areas to raise overall site grades can induce settlements in the underlying natural soils. If more than 1 foot of additional 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 encountered at a depth of about 27 feet below the existing ground surface but signs of past groundwater were observed at depths as shallow as 7.5 feet. In general, we do not anticipate that excavations will encounter groundwater.

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 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 maximum 20% passing the No. 200 sieve, a maximum Liquid Limit of 35 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, 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 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 are moisture-sensitive, which means they are 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:

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

[8] American Association of State Highway and Transportation Officials

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
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).

Where the utility does not underlie structurally loaded facilities and public rights of way, on-site fill and 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 near-surface 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.

[9] American Public Works Association

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 structures may be supported upon conventional isolated and/or continuous wall foundations placed on undisturbed natural soils and/or on structural fill extending to undisturbed natural soils. Footings may be designed using a net bearing pressure of 1,400 psf if placed on undisturbed natural soils (using an assumed friction angle of 26 degrees for the clay soils) or 1,500 psf if placed on a minimum 18 inches of structural fill. 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 16 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 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 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 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.

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 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 (calculations are attached). 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 0.30 for natural clay soils or 0.40 for 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 300 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 on-site clayey soils placed and compacted in accordance with the recommendations presented herein (calculations are attached using an assumed friction angle of 26 degrees). 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.

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)	47	34
At-Rest Pressure (wall is not allowed to yield)	67	N/A
Passive Pressure (wall moves into the soil)	300	10

*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 CRAWL SPACES

We understand that crawl spaces will be utilized for the proposed townhome buildings (instead of slab on grade floors). Moisture can propagate upward into crawl spaces, thus we recommend that a vapor barrier be placed on the crawl space bottoms. We understand that the maximum allowable height for crawl spaces is 4 feet.

10.0 DRAINAGE RECOMMENDATIONS

It is important to the long-term performance of foundations 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 4 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 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 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:

11.1 Field Observations

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

11.2 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.

11.3 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.

12.0 LIMITATIONS

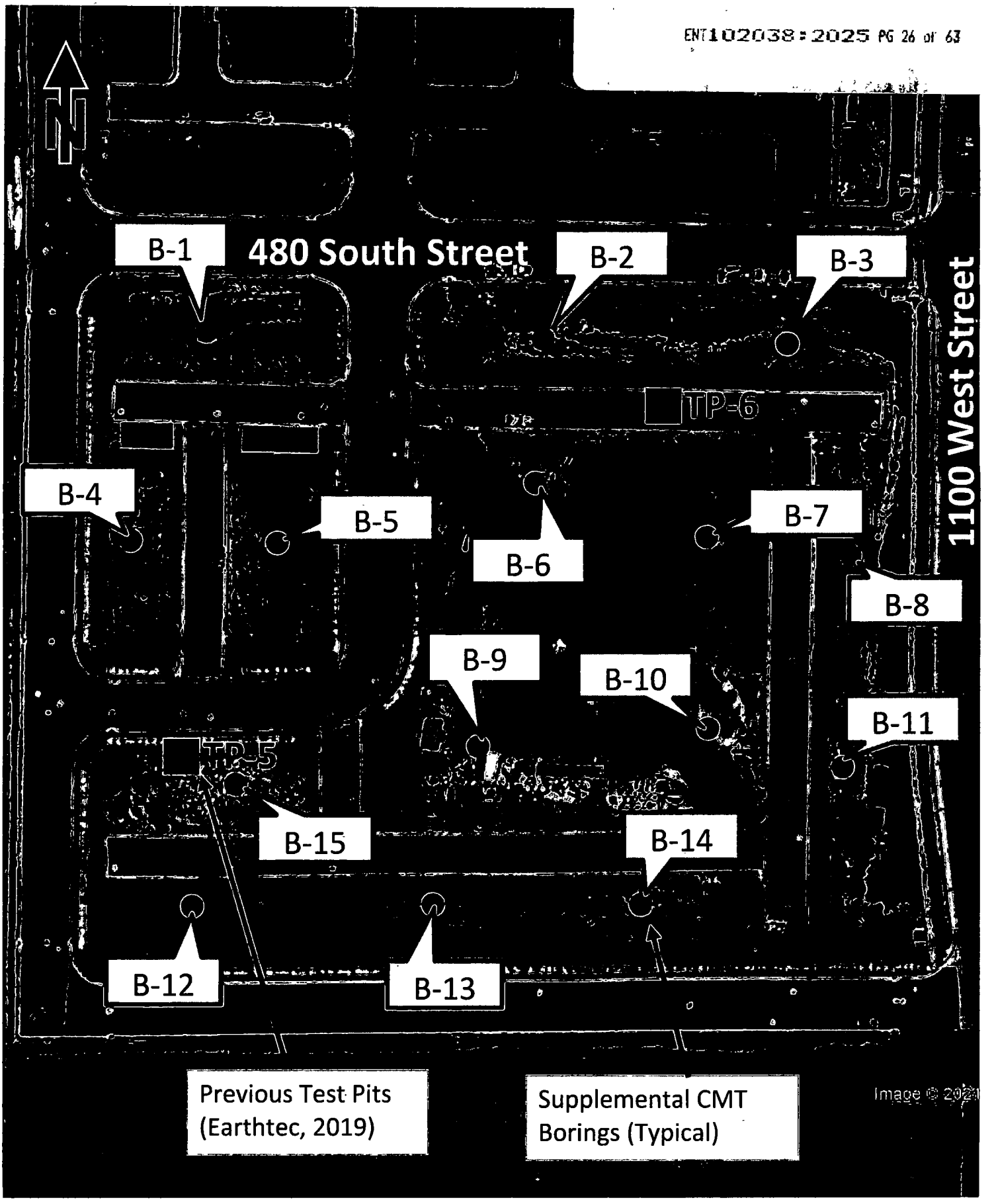
The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground 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) 492-4132. To schedule materials testing, please call (801) 381-5141.

APPENDIX

SUPPORTING
DOCUMENTATION



Edgewater Townhomes 480 South 1140 West, American Fork, Utah	CMT TECHNICAL SERVICES **Site Map**	Date: 13-Dec-24 Job # 23522	Figure: 1

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-1

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Brown Silty CLAY with sand (CL), trace gravel moist, soft												
				1	2 1 1	2								
4		Gray Silty CLAY (CL), some sand moist, soft		2	1 1 2	3								
8		very soft		3	1 0 1	1	36		0	8	92			
		medium stiff		4	1 2 4	6								
12														
16				5	1 1 6	7								
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.3677°, -111.82815°
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
Page: 1 of 1

Figure: 2

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-2

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Brown Silty CLAY with sand (CL), trace gravel, some roots moist, stiff												
				6	4 4 4	8								
4		Reddish Gray Fat CLAY (CH), some sand moist, soft (no sample recovered)												
				7	1 1 1	2								
		medium stiff		8	3 6 3	9	28	93				60	20	40
		Gray Silty CLAY (CL), some sand and organics moist, medium stiff		9	1 2 4	6								
12														
		soft		10	1 1 1	2								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.3677°, -111.82743°
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
Page: 1 of 1

Figure: 3

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log — B-3

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown sandy clay, some gravel moist												
				11	13 14 14	28								
4		Gray Silty CLAY (CL), some sand moist, medium stiff												
				12	2 3 2	5								
8		grades reddish gray, trace gravel soft		13	2 1 2	3	27		1	4	95			
		stiff		14	2 3 5	8								
12														
16				15	2 4 4	8								
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36774°, -111.82696°
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
Page: 1 of 1

Figure 4

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-4

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Brown Silty CLAY (CL), some gravel and sand, some roots moist, medium stiff												
				16	2 3 1	4								
4		grades reddish gray with some calcification		17	1 2 2	4								
8				18	3 2 4	6								
				19	2 2 5	7	22		0	16	84			
12														
16				20	1 1 6	7								
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36728°, -111.8283°
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
Page: 1 of 1

Figure 5

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-5

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown silty to clayey gravel with sand, some roots												
		moist												
				21	4 2 2	4	11		30	22	48			
4		Brown Silty CLAY (CL), some sand												
		moist, stiff												
				22	2 3 2	5								
8		grades reddish brown with some oxidation		23	4 4 5	9								
		grades reddish gray		24	2 3 3	6								
12														
				25	0 1 6	7								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.3673°, -111.82799°
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
Page: 1 of 1

Figure: 6

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-6

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: grayish brown silty gravel with sand, moist												
				26	41 33 29	62								
4														
		grades more sandy		27	18 14 21	35	22	100						
		Gray Silty CLAY (CL), some sand, occasional sand lenses, moist, soft												
8				28	3 1 1	2	29		3	7	90			
		very soft, no sample recovered		29	0 0 0	0								
12														
		grades dark gray to black, stiff		30	5 5 4	9								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.3674°, -111.82738°
Surface Elev. (approx): Not Given

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

CMT TECHNICAL SERVICES

Figure 7

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-7

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: grayish brown silty gravel with sand, moist												
				31	9 12 13	25								
4														
		Brownish Gray Silty CLAY (CL), some sand, moist, stiff		32	3 4 10	14								
8		with gravel at 7.5', medium stiff		33	5 3 4	7	22		16	8	76			
		very soft		34	0 0 0	0								
12														
		stiff		35	3 4 6	10								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36728°, -111.82691°
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
Page: 1 of 1

Figure: 8

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log — B-8

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown sandy clay with gravel, moist												
				36	6 7 7	14	17		10	14	76			
4														
				37	4 2 4	6								
		Gray Silty CLAY (CL), some sand, moist, very soft												
8				38	1 0 1	1								
		grades with some calcification, medium stiff												
				39	1 2 2	4								
12														
		sand lense		40	2 3 5	8								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36697°, -111.82741°
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
Page: 1 of 1

Figure: 9

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log — B-9

Total Depth: 70'
Water Depth: 27'

Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown clayey gravel with sand — moist												
				41	24 20 8	28								
4		grades with more clay												
				42	11 8 7	15								
		Brown Silty CLAY (CL), some gravel — moist, soft												
8		no sample recovered		43	3 1 1	2								
		grades with some sand, gravel grades out		44	1 1 2	3	21		0	11	89			
12														
		grades reddish brown — medium stiff		45	2 3 3	6								
16		grades dark gray												
20		Gray Fat CLAY (CH), trace sand — very moist, very soft		46	0 0 0	0	41		0	1	99	51	21	30
24														
		sand lense at 25' — soft		47	4 2 1	3								
▽ 28		wet												

Remarks: Groundwater encountered during drilling at depth of 27 feet.

Coordinates: 40.36705°, -111.82721°
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: 10

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-9

Total Depth: 70'
Water Depth: 27'
Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
28		Gray Fat CLAY (CH), trace sand (Continued)												
		Dark Gray Sandy SILT (ML), occasional clay lenses wet, stiff		48	4 3 6	9	26		0	48	52			
32		Barite added to offset heaving soils												
		grades gray very stiff		49	7 7 11	18	25		0	30	70	19	17	2
40		Gray Sandy SILTY CLAY (CL-ML) wet, stiff		50	4 4 6	10	24		0	35	65	22	17	5
44		Gray Silty CLAY (CL), some sand, occasional sand lenses wet, stiff		51	4 4 6	10								
48				52	3 4 8	12								
52														
56		medium stiff		53	2 2	4	38		0	2	98			

Remarks: Groundwater encountered during drilling at depth of 27 feet.

Coordinates: 40.36705°, -111.82721°
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: 10

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-9

Total Depth: 70'
Water Depth: 27'
Date: 12/12/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
56		Gray Silty CLAY (CL), some sand (Continued)			2									
60		grades with more frequent sand lenses stiff		54	3 6 8	14								
64		grades with some gravel		55	8 7 4	11								
68		sand soils heaving up into augers												
		END AT 70'												
72		Note: Some artesian water pressure observed at end of drilling, but dissipated quickly												
76														
80														
84														

Remarks: Groundwater encountered during drilling at depth of 27 feet.

Coordinates: 40.36705°, -111.82721°
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: 10

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-10

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown clayey gravel with sand, moist												
				56	7 4 3	7								
4														
				57	9 9 7	16								
8		Brown Silty CLAY with sand (CL), trace gravel, moist, medium stiff		58	5 3 4	7	24	89	2	16	82			
		grades reddish brown		59	1 2 3	5								
12														
		grades gray		60	3 3 5	8								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36699°, -111.82697°
Surface Elev. (approx): Not Given

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

CMT TECHNICAL SERVICES

Figure: 11

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-11

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown silty to clayey gravel with sand moist												
				61	14 12 8	20								
4														
		Brown Silty CLAY (CL), some sand, some roots moist, stiff		62	6 6 5	11	28		0	6	94			
		soft no sample recovered		63	1 1 1	2								
8														
		grades reddish brown with some calcification		64	1 1 1	2								
12														
		medium stiff		65	2 2 3	5								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36697°, -111.82651°
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
Page: 1 of 1

Figure: 12

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-12

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown gravelly clay with sand, moist											
				66	5 9 9 (18)								
4		Brown Silty CLAY (CL), some sand, some roots, moist, stiff											
				67	3 4 4 (8)								
8		grades reddish brown, medium stiff		68	1 2 3 (5)								
				69	2 4 5 (9)								
12		grades reddish gray											
		stiff		70	4 6 10 (16)	21	108				30	20	10
16		END AT 16.5'											
20													
24													
28													

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36659°, -111.82798°
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
Page: 1 of 1

Figure: 13

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log — B-13

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown gravelly clay with sand, moist												
		no sample recovered		71	8 20 24	44								
4		Brown Silty CLAY with sand (CL), trace gravel, some roots, moist, medium stiff												
				72	3 3 2	5	30		3	17	80			
8		grades grayish brown		73	1 2 2	4								
		grades reddish brown with some roots		74	2 2 4	6								
12														
		grades gray		75	1 2 3	5								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36663°,-111.82736°
Surface Elev. (approx): Not Given

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

CMT TECHNICAL SERVICES

Figure: 14

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-14

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown sandy silt, some organics moist												
				76	3 3 8	11								
4		Brown Fat CLAY (CH), some sand, some roots moist, stiff		77	8 12 14	26	30	91				57	25	32
8		grades reddish gray with trace gravel and some calcification medium stiff		78	1 2 2	4								
		Brownish Gray Silty CLAY (CL), some sand moist, stiff		79	6 8 8	16								
12														
		grades gray medium stiff		80	0 2 2	4								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36655°, -111.82686°
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
Page: 1 of 1

Figure: 15

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Bore Hole Log B-15

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 12/13/24
Job #: 23522

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		FILL: brown silty gravel with sand, moist												
				81	5 6 7	13								
4		Brown Silty CLAY with sand (CL), some gravel, moist, medium stiff												
				82	3 3 1	4	17		11	17	72			
		grades reddish gray with trace gravel												
8				83	3 3 7	10								
		grades brownish gray with some roots, stiff												
				84	2 3 5	8								
12														
		grades gray												
				85	4 3 5	8								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.36689°, -111.827996°
Surface Elev. (approx): Not Given

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

CMT TECHNICAL SERVICES

Figure: 16

Edgewater Townhomes

480 South 1140 West, American Fork, Utah

Key to Symbols

Date: 12/13/24

Job #: 23522

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

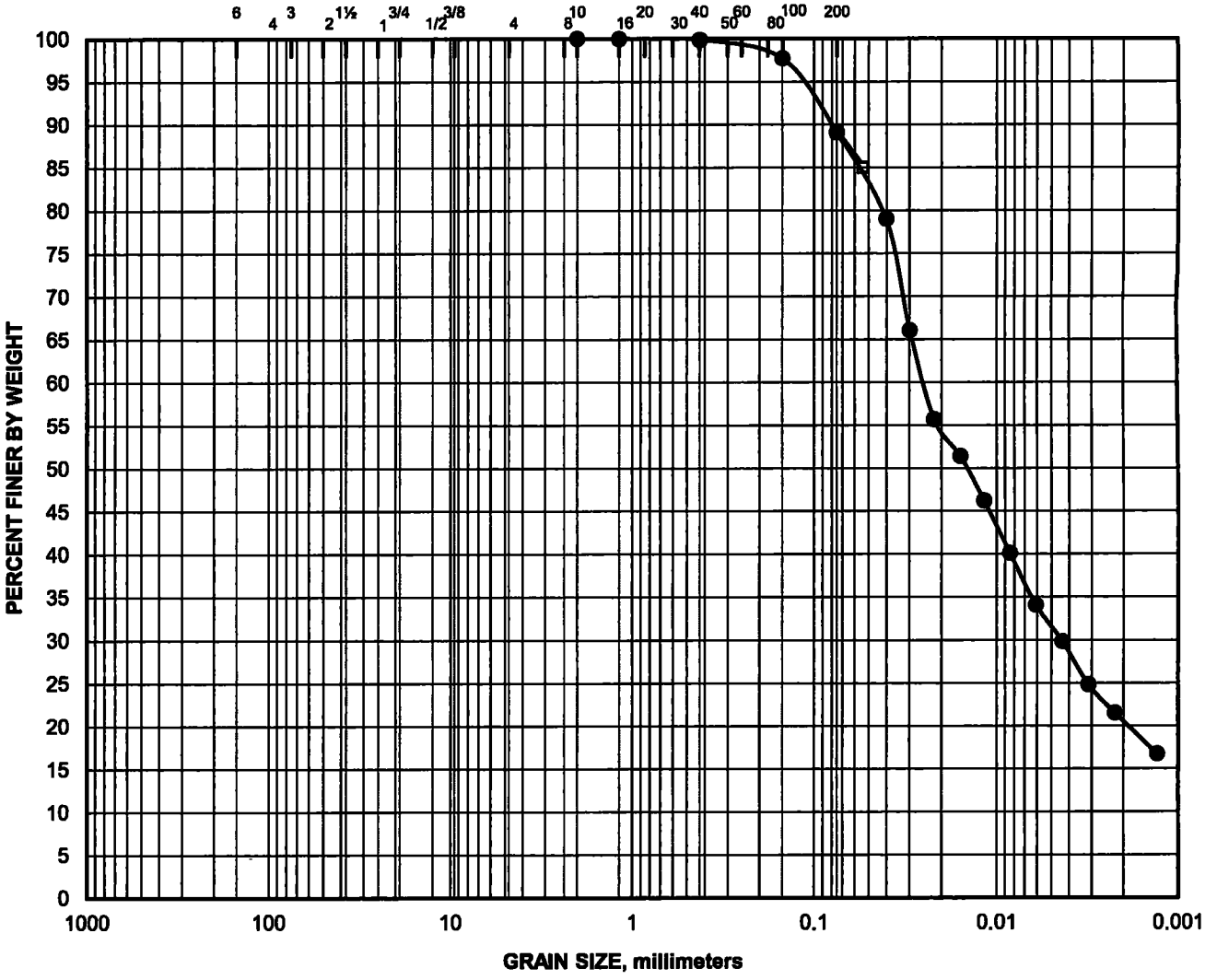
1. The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
2. The subsurface conditions represented on the logs are for the locations specified. Caution should be exercised if interpolating between or extrapolating beyond the exploration locations.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

CMT TECHNICAL SERVICES

Figure: 17

GRAIN SIZE DISTRIBUTION

U.S. SIEVE OPENING, inches | U.S. SIEVE NUMBERS | HYDROMETER



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	B-9 at 10'	Lean CLAY (CL)	21					
■								
▲								
◆								
X								

	Specimen Identification	D100	D85	D60	D30	D15	D10	%Gravel	%Sand	%Silt	%Clay
●	B-9 at 10'	2.00						0	11	57.5	31.6
■											
▲											
◆											
X											

PROJECT NO.: 23522

CMT TECHNICAL SERVICES

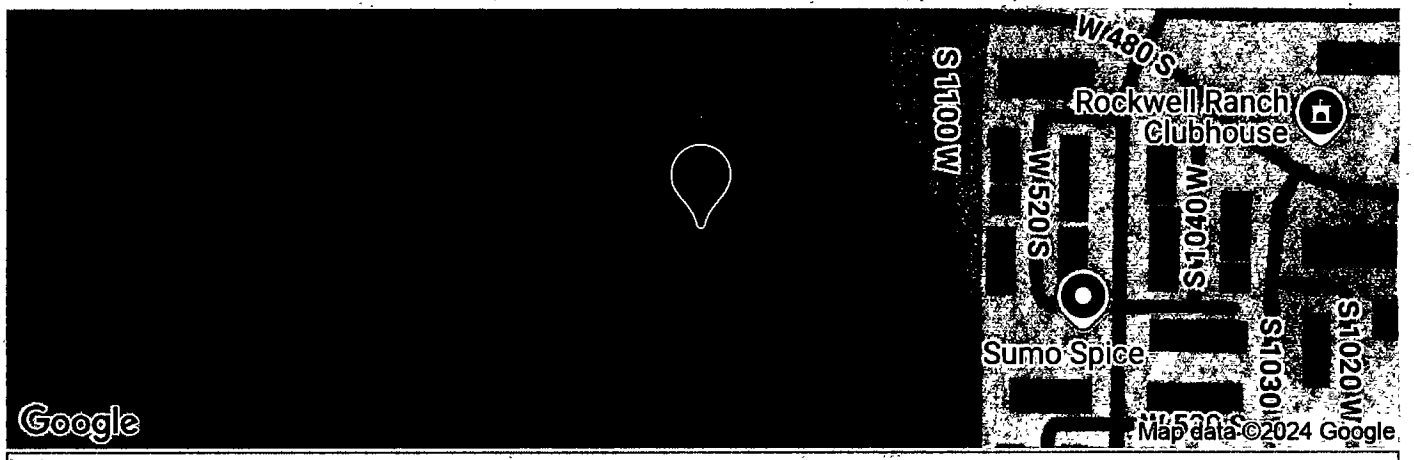
FIGURE NO.: 18

USGS web services were down for some period of time and as a result this tool wasn't operational, resulting in *timeout* error.
USGS web services are now operational so this tool should work as expected.

OSHPD

Edgewater Townhomes

Latitude, Longitude: 40.3671, -111.8275



Date	12/17/2024, 10:01:16 AM
Design Code Reference Document	ASCE7-16
Risk Category	II
Site Class	E - Soft Clay Soil

Type	Value	Description
S_S	1.22	MCE_R ground motion. (for 0.2 second period)
S_1	0.44	MCE_R ground motion. (for 1.0s period)
S_{MS}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S_{DS}	null -See Section 11.4.8	Numeric seismic design value at 0.2 second SA
S_{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F_a	null -See Section 11.4.8	Site amplification factor at 0.2 second
F_v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.544	MCE_G peak ground acceleration
F_{PGA}	1.156	Site amplification factor at PGA
PGA_M	0.629	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.22	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	1.392	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.995	Factored deterministic acceleration value. (0.2 second)
S1RT	0.44	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.496	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	1.16	Factored deterministic acceleration value. (1.0 second)
PGAd	1.161	Factored deterministic acceleration value. (Peak Ground Acceleration)
PGA_{UH}	0.544	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.877	Mapped value of the risk coefficient at short periods
C_{R1}	0.888	Mapped value of the risk coefficient at a period of 1 s
C_V		Vertical coefficient

Company:	**CMT Technical Services**		
Project Name:	Edgewater Townhomes		
Location:	American Fork, Utah	**Designer:** Bill Turner	**Checked By:**
Project #:	23522	**Date:** 1/2/2025	**Date:**

Units (1=SI, 2=US):	2		**Ground Slope, S:**	0.1	% (Enter either S or W)
PGA:	0.63		**Free-Face Ratio, W:**		% (Enter either S or W)
(Modal) M_w:	7.09		**Hammer Efficiency:**	80	%
Distance:	8.3	km	**Sampler Liner:**	NL	NL = Room for liners, but no liners L = Standard Split Spoon
Rod Lengths:	5	ft	**Borehole Diameter:**	8	in

Boring No.	Top Samp. Depth (ft)	Depth to Water (ft)	Measured SPT N	γ (lb/ft^3)	Thickness (ft)	Fines (%)	D50 (mm)	$K_{(agmg)}$	Soil Type	Susceptible?
B-9	10	10	3	112	5	99	0.000		CL	No
B-9	15	10	6	114	5	52	0.083		CL	No
B-9	20	10	0	111	5	70	0.010		CH	No
B-9	25	10	3	112	5	99	0.000		CH	No
B-9	30	10	9	115	5	52	0.083		ML	Yes
B-9	35	10	18	118	5	70	0.010		ML	Yes
B-9	40	10	10	115	5	65	0.013		CL-ML	Yes
B-9	45	10	10	115	5	89	0.003		CL	No
B-9	50	10	12	116	5	89	0.003		CL	No
B-9	55	10	4	113	5	98	0.001		CL	No
B-9	60	10	14	117	5	98	0.001		CL	No
B-9	65	10	11	116	5	98	0.001		CL	No

Deterministic Liquefaction Triggering using Youd & Idriss et al (2001)

a_{max} = 0.6300 g
M_w = 7.09
MSF^{Idriss} = 1.154372
$MSF^{Andrus+Stokoe}$ = 1.203842

Boring No	Soil Type	Depth (ft)	Depth (m)	Thick. (m)	Water (m)	γ (kN/m³)	σ_v (kPa)	σ_v' (kPa)	Fines (%)	$(N_1)_{60}$	$(N_1)_{60,cs}$	r_d	K_σ	$K_{\sigma(eqlay)}$	CSR_{eq}	$CRR_{7.5}$	FS_{Liq}
B-9	CL	10.5	3.200	1.524	3.048	17.59	56.31	54.81	99	5.44	11.52	0.976	1.131	1.00	Not Suscpt	0.1289	Not Suscpt
B-9	CL	15.5	4.724	1.524	3.048	17.91	84.13	67.69	52	11.35	18.62	0.964	1.084	1.00	Not Suscpt	0.1902	Not Suscpt
B-9	CH	20.5	6.248	1.524	3.048	17.44	109.91	78.54	70	0.00	5.00	0.952	1.052	1.00	Not Suscpt	0.0861	Not Suscpt
B-9	CH	25.5	7.772	1.524	3.048	17.59	136.99	90.68	99	5.05	11.06	0.941	1.022	1.00	Not Suscpt	0.1256	Not Suscpt
B-9	ML	30.5	9.296	1.524	3.048	18.07	165.31	104.06	52	15.49	23.59	0.926	0.992	1.00	0.6023	0.2601	0.505
B-9	ML	35.5	10.820	1.524	3.048	18.54	194.35	118.16	70	32.25	43.70	0.885	0.940	1.00	0.5961	#N/A	>10
B-9	CL-ML	40.5	12.344	1.524	3.048	18.07	221.09	129.96	65	15.43	23.52	0.844	0.928	1.00	0.5882	0.2558	0.481
B-9	CL	45.5	13.868	1.524	3.048	18.07	248.62	142.55	89	14.61	22.54	0.804	0.903	1.00	Not Suscpt	0.2415	Not Suscpt
B-9	CL	50.5	15.392	1.524	3.048	18.22	276.65	155.65	89	16.98	25.38	0.763	0.879	1.00	Not Suscpt	0.2993	Not Suscpt
B-9	CL	55.5	16.916	1.524	3.048	17.75	302.91	166.97	98	5.21	11.25	0.722	0.905	1.00	Not Suscpt	0.1270	Not Suscpt
B-9	CL	60.5	18.440	1.524	3.048	18.38	331.98	181.10	98	18.31	26.97	0.682	0.840	1.00	Not Suscpt	0.3455	> 18 m
B-9	CL	65.5	19.964	1.524	3.048	18.22	359.48	193.67	98	13.35	21.02	0.641	0.878	1.00	Not Suscpt	0.2189	> 18 m
														1.00			
														1.00			
														1.00			
														1.00			
														1.00			
														1.00			
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														1.00			
														1.00			
														1.00			
														1.00			

SPT N	C_N	C_E	Rod Len.(ft)	Stickup (m)	C_R	C_B	C_S	$(N_1)_{60}$	Rel Dens %	flag (=1)	
3	1.26	1.33	15.0	4.88	0.85	1.15	1.10	5.44	40	0	15
6	1.18	1.33	20.0	6.40	0.95	1.15	1.10	11.35	40	0	21
0	1.11	1.33	25.0	7.92	0.95	1.15	1.10	0.00	40	0	8
3	1.05	1.33	30.0	9.45	0.95	1.15	1.10	5.05	40	0	15
9	0.99	1.33	35.0	10.97	1.00	1.15	1.14	15.49	60	1	27
18	0.93	1.33	40.0	12.50	1.00	1.15	1.26	32.25	80	1	44
10	0.89	1.33	45.0	14.02	1.00	1.15	1.14	15.43	60	1	29
10	0.84	1.33	50.0	15.54	1.00	1.15	1.13	14.61	60	0	29
12	0.80	1.33	55.0	17.07	1.00	1.15	1.15	16.98	60	0	33
4	0.77	1.33	60.0	18.59	1.00	1.15	1.10	5.21	40	0	17
14	0.74	1.33	65.0	20.12	1.00	1.15	1.16	18.31	60	0	37
11	0.71	1.33	70.0	21.64	1.00	1.15	1.12	13.35	40	0	31
										0	
										0	
										0	
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										0	
										0	
										0	

Deterministic Liquefaction Triggering using Boulanger & Idriss (2010)

a_{max} = 0.6300 g
M_w = 7.09
MSF = 1.134363

Boring No.	Soil Type	Depth (ft)	Depth (m)	Thick. (m)	Water (m)	γ (kN/m³)	σ_v (kPa)	σ_v' (kPa)	Fines (%)	$(N_1)_{60}$	$(N_1)_{60,cs}$	r_d	C_σ	K_σ	$K_{\sigma(eqlay)}$	CSR_{eq}	$CRR_{7.5}$	FS_{Liq}
B-9	CL	10.5	3.200	1.524	3.048	17.59	56.31	54.81	99	5.94	11.43	0.973	0.097	1.060	1.00	Not Suscpt	0.1282	Not Suscpt
B-9	CL	15.5	4.724	1.524	3.048	17.91	84.13	67.69	52	11.63	17.24	0.953	0.120	1.049	1.00	Not Suscpt	0.1762	Not Suscpt
B-9	CH	20.5	6.248	1.524	3.048	17.44	109.91	78.54	70	0.00	5.57	0.930	0.078	1.020	1.00	Not Suscpt	0.0895	Not Suscpt
B-9	CH	25.5	7.772	1.524	3.048	17.59	136.99	90.68	99	5.10	10.59	0.906	0.094	1.010	1.00	Not Suscpt	0.1222	Not Suscpt
B-9	ML	30.5	9.296	1.524	3.048	18.07	165.31	104.06	52	15.50	21.12	0.881	0.139	0.996	1.00	0.5729	0.2203	0.428
B-9	ML	35.5	10.820	1.524	3.048	18.54	194.35	118.16	70	33.09	38.66	0.854	0.300	0.954	1.00	0.5753	2.7383	5.304
B-9	CL-ML	40.5	12.344	1.524	3.048	18.07	221.09	129.96	65	15.65	21.24	0.827	0.140	0.965	1.00	0.5763	0.2219	0.429
B-9	CL	45.5	13.868	1.524	3.048	18.07	248.62	142.55	89	14.92	20.44	0.800	0.136	0.954	1.00	Not Suscpt	0.2113	Not Suscpt
B-9	CL	50.5	15.392	1.524	3.048	18.22	276.65	155.65	89	17.68	23.20	0.774	0.151	0.935	1.00	Not Suscpt	0.2529	Not Suscpt
B-9	CL	55.5	16.916	1.524	3.048	17.75	302.91	166.97	98	5.17	10.66	0.748	0.095	0.953	1.00	Not Suscpt	0.1227	Not Suscpt
B-9	CL	60.5	18.440	1.524	3.048	18.38	331.98	181.10	98	19.73	25.22	0.722	0.164	0.905	1.00	Not Suscpt	0.2953	> 18 m
B-9	CL	65.5	19.964	1.524	3.048	18.22	359.48	193.67	98	14.16	19.66	0.699	0.132	0.915	1.00	Not Suscpt	0.2017	> 18 m
															1.00			
															1.00			
															1.00			
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															1.00			
															1.00			

SPT N	C_N	C_E	C_R	C_B	C_S	$(N_1)_{60}$
3	1.38	1.33	0.85	1.15	1.10	5.94
6	1.21	1.33	0.95	1.15	1.10	11.63
0	1.17	1.33	0.95	1.15	1.10	0.00
3	1.06	1.33	0.95	1.15	1.10	5.10
9	0.99	1.33	1.00	1.15	1.14	15.50
18	0.95	1.33	1.00	1.15	1.26	33.09
10	0.90	1.33	1.00	1.15	1.14	15.65
10	0.86	1.33	1.00	1.15	1.13	14.92
12	0.84	1.33	1.00	1.15	1.15	17.68
4	0.77	1.33	1.00	1.15	1.10	5.17
14	0.79	1.33	1.00	1.15	1.16	19.73
11	0.75	1.33	1.00	1.15	1.12	14.16

Conversions

atmosphere P_a = 101.325 kPa
2116.216 psf
Boring dia. = 203.2 mm
Lengths/depths = 0.3048
pcf to kN/m³ = 0.157087

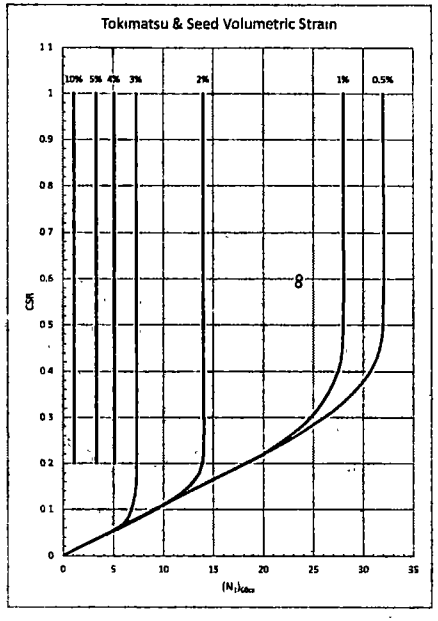
boring diameter(mm)	C_B	
65 - 115 mm	1	(2.5-4.5 inches)
150 mm	1.05	(6 inches)
200 mm	1.15	(8 inches)

10 - 30

Deterministic Settlement using Tokimatsu & Seed (1987)

Threshold FS for Settlement 1.2

Boring No.	Soil Type	Depth (ft)	Susceptible?	Thick.(ft)	$(N_1)_{60,cs}$	CSR	CRR	FS_{Liq}	Interpolated Vol. Strain	Settlement of layer(in)	Settlement Σlayers(in)
B-9	CL	10 50	No	5.00	11 522	Not Suscpt	0.1289	Not Suscpt	#N/A	0 00	1 58
B-9	CL	15 50	No	5 00	18.623	Not Suscpt	0 1902	Not Suscpt	#N/A	0 00	
B-9	CH	20 50	No	5 00	5 000	Not Suscpt	0.0861	Not Suscpt	#N/A	0 00	
B-9	CH	25 50	No	5.00	11 058	Not Suscpt	0 1256	Not Suscpt	#N/A	0 00	
B-9	ML	30.50	Yes	5.00	23.590	0 6023	0.2601	0 5052	1 326	0.80	
B-9	ML	35 50	Yes	5 00	43 697	0 5961	#N/A	>10	#N/A	0 00	
B-9	CL-ML	40 50	Yes	5 00	23 521	0 5882	0.2588	0.4815	1 305	0 78	
B-9	CL	45 50	No	5 00	22 537	Not Suscpt	0.2415	Not Suscpt	#N/A	0 00	
B-9	CL	50.50	No	5 00	25.380	Not Suscpt	0 2993	Not Suscpt	#N/A	0.00	
B-9	CL	55.50	No	5 00	11.254	Not Suscpt	0.1270	Not Suscpt	#N/A	0.00	
B-9	CL	60 50	No	5 00	26.970	Not Suscpt	0.3455	> 18 m	#N/A	0.00	
B-9	CL	65 50	No	5.00	21 018	Not Suscpt	0 2189	> 18 m	#N/A	0 00	



Deterministic Settlement using Ishihara & Yoshimine (1992)

(Settlement limited to FS<1 2)

Boring No.	Soil Type	Depth (m)	Susceptible?	Thick.(m)	$(N_1)_{60,cs}$	CSR	CRR	FS_{Liq}	Compute Deterministic Vertical Strain: F_α	γ_{fm}	γ_{max}	ε_v	Compute Ground Surface Settlement: DF_i	ε_v*DF_i	DF_i * t_i	$\varepsilon_{v,equiv}$	Sett (m)	Compute Settlement for Each Layer: c_1*Df_i*(Σt_i)	$\Sigma(t_i$*$DF_i)$	ε_i	S_i (cm)	Σ Sett (in)
B-9	CL	3 20	No	0 000	11 425	Not Suscpt	0.1282	Not Suscpt	0.8790	0 0000	0 0000	0 0000	0 822	0 0000	0 000	0 0146	2.373	0 0000	1.824	0 0000	0.000	2.373
B-9	CL	4 72	No	0.000	17 243	Not Suscpt	0 1762	Not Suscpt	0 6556	0.0000	0 0000	0 0000	0 738	0 0000	0.000			0 0000		0 0000	0 000	
B-9	CH	6 25	No	0.000	5 575	Not Suscpt	0 0895	Not Suscpt	0 9364	0.0000	0 0000	0 0000	0 653	0 0000	0 000			0 0000		0 0000	0 000	
B-9	CH	7 77	No	0.000	10 590	Not Suscpt	0 1222	Not Suscpt	0.9007	0 0000	0 0000	0 0000	0 568	0 0000	0.000			0 0000		0 0000	0.000	
B-9	ML	9 30	Yes	1 524	21 117	0 5729	0.2203	0.4285	0 4576	0 1402	0 1402	0 0220	0 484	0 0162	0 737			0 0487		0.0267	3 661	
B-9	ML	10 82	Yes	1 524	38 662	0.5753	2 7383	5.3040	-0 7037	0.0000	0 0000	0 0000	0.399	0.0000	0 608			0 0000		0 0000	0 000	
B-9	CL-ML	12 34	Yes	1 524	21.238	0.5763	0.2219	0.4292	0 4509	0 1382	0 1382	0.0219	0.314	0.0105	0 479			0 0315		0 0173	2 367	
B-9	CL	13 87	No	0.000	20.436	Not Suscpt	0 2113	Not Suscpt	0 4946	0.0000	0 0000	0.0000	0.230	0 0000	0 000			0 0000		0.0000	0.000	
B-9	CL	15 39	No	0.000	23.200	Not Suscpt	0 2529	Not Suscpt	0.3395	0 0000	0 0000	0.0000	0.145	0 0000	0.000			0 0000		0 0000	0.000	
B-9	CL	16 92	No	0 000	10 661	Not Suscpt	0.1227	Not Suscpt	0.8990	0 0000	0 0000	0 0000	0.060	0 0000	0.000			0 0000		0.0000	0.000	
B-9	CL	18 44	No	0 000	25.219	Not Suscpt	0.2953	> 18 m	0 2186	0 0000	0 0000	0.0000	0.000	0 0000	0.000			0 0000		0 0000	0.000	
B-9	CL	19 96	No	0 000	19 656	Not Suscpt	0 2017	> 18 m	0 5358	0 0000	0.0000	0.0000	0.000	0 0000	0.000			0 0000		0 0000	0 000	

Deterministic Lateral Spreading using Youd, Hansen & Bartlett (2002)

Boring No.	Depth (ft)	Thick. (ft)	Susceptible?	$(N_1)_{60,cs}$	T_{15} (m)	F_{15} (%)	$D50_{15}$(mm)	D_h (ft)
B-9	10.50	5.00	Not Suscpt	11.52	0.00	0.00	0.00	**0.00**
B-9	15.50	5.00	Not Suscpt	18.62				
B-9	20.50	5.00	Not Suscpt	5.00				
B-9	25.50	5.00	Not Suscpt	11.06				
B-9	30.50	5.00	No, N>15	23.59				
B-9	35.50	5.00	No, N>15	43.70				
B-9	40.50	5.00	No, N>15	23.52				
B-9	45.50	5.00	Not Suscpt	22.54				
B-9	50.50	5.00	Not Suscpt	25.38				
B-9	55.50	5.00	Not Suscpt	11.25				
B-9	60.50	5.00	Not Suscpt	26.97				
B-9	65.50	5.00	Not Suscpt	21.02				

Deterministic Method

S =	0.1	%
W =		%
R =	8.3	km
R* =	12.97843	km
M =	7.09	
Percentile =	50	(assumed)

Limitations:

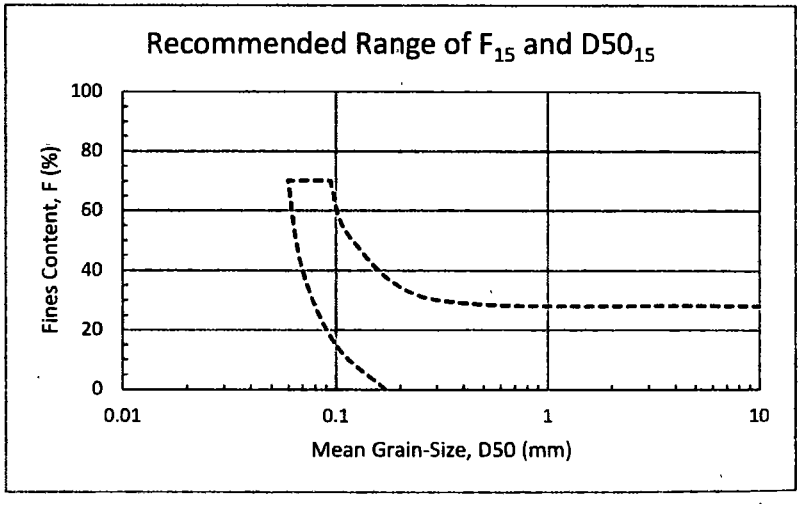
-Drainage is impeded

-Fines content up to 70%, must be non-plastic

-Lateral spreading limited to 6 meters

Regression Coefficients

	GS	FF
b_0	-16.213	-16.713
b_1	1.532	1.532
b_2	-1.406	-1.406
b_3	-0.012	-0.012
b_4		0.592
b_5	0.338	
b_6	0.540	0.540
b_7	3.413	3.413
b_8	-0.795	-0.795



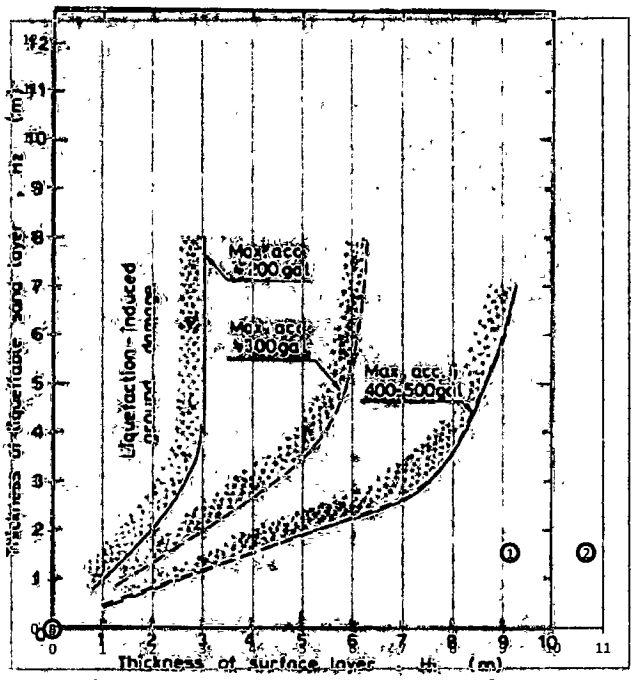


Fig. 88 Proposed boundary curves for site identification of liquefaction-induced damage

	Point 1	Point 2	Point 3	Point 4	Point 5		1	2	3	4	5
Boring # =	B-9	B-9					(meters)	(meters)	(meters)	(meters)	(meters)
Depth (feet) =	30	40									
PGA_M (g, corrected for Site Class) =	0.63	0.63	0.63	0.63	0.63						
Non-liquefiable surface layer (feet) =	30	35				(x)	9.144	10.668	0	0	0
Liquefiable layer thickness (feet) =	5	5				(y)	1.524	1.524	0	0	0

BEARING CAPACITY							
Project:	Edgewater Townhomes, #23522				Prepared By: Bill Turner, P.E.		
Width:	1.5	feet (B)			Reviewed By:		
Length:	25	feet					
Depth:	2.5	feet (z)					
Soil wt:	120	pcf					
Cohesion:	0	psf					
Phi angle:	26	deg.* =	0.453786	radians =	0.49	coef. of friction	
Inclination:	0	deg.					
FS:	3						
K_p =	2.56	s	d	i	N (Terzaghi)		
N_c =	22.25	1.03	1.53	1.00	27.1		
N_q =	11.85	1.02	1.27	1.00	14.2		
N_γ =	8.00	1.02	1.27	1.00	10.9		
$Q_{ult} = c\, N_c\, s_c\, d_c\, i_c + \gamma\, z\, N_q\, s_q\, d_q\, i_q + \frac{1}{2}\, \gamma\, B\, N_\gamma\, s_\gamma\, d_\gamma\, i_\gamma$							
$Q_{allow} = Q_{ult} / FS$							
	Q_{ult}	Q_{allow}					
Terzaghi:	5,246	1,749	psf				
Meyerhof:	5,500	1,833	psf				

23522 Settlement--Footings

SETTLEMENT OF FOOTINGS								
Project:	Edgewater Townhomes, #23522 (Based on B-2 soil profile)							
B:	10.351	feet (width or diameter)			b =	5.175492	ft (1/2 width/dia)	
L:	10.351	feet (length)			l =	5.175492	ft (1/2 length)	
foot. depth:	2.5	feet					Spread Load,k:	150
unit weight:	119	pcf (above footing depth)					Strip Load,k:	8
allowable q:	1400	psf						
footing type:	2	(1=strip,2&3=square/rect.,4=circular)						
	4	(4 for center, 1 for corner of square/rect.)						
water depth:	7.5	feet						

DEFINE SOIL PROFILE:			preconsol		Density	Collapse	Below ftg.	Avg.
Soil type	C_c'	C_r'	press.,σ_c'(psf)	OCR	(pcf)	(%)	depth (ft)	OCR
Fill	0.01	0.00125			135		0.0	1.00
CL1	0.049	0.0086		4	119		2.0	4.00
CH	0.098	0.0342	3000		119		7.5	3.48
CL2	0.049	0.0086	3600		130		22.5	2.34

SQUARE/RECTANGULAR FOOTINGS (Boussinesq Method)...

	Below ftg.		Increased	avg. ovrbn.	Incremnt.	Collapse	Total	
Soil Type	depth (ft)	Influence	Stress (psf)	press.(psf)	Sett. (in.)	Sett. (in.)	Set. (in.)	
Fill	0	0.000	0.0	297.5	0.000	0.000	0.00	
CL1	1	0.995	1392.8	416.5	0.083	0.000	0.08	
CL1	2	0.964	1349.4	535.5	0.056	0.000	0.14	
CH	3	0.900	1259.9	654.5	0.191	0.000	0.33	
CH	4	0.813	1138.1	773.5	0.161	0.000	0.49	
CH	5	0.718	1004.6	892.5	0.134	0.000	0.63	
CH	6	0.625	874.9	949.1	0.116	0.000	0.74	
CH	7	0.541	757.4	1005.7	0.100	0.000	0.84	
CH	7.5	0.503	704.3	1034.0	0.046	0.000	0.89	
CL2	8.5	0.435	609.4	1101.6	0.020	0.000	0.91	
CL2	9.5	0.378	529.0	1169.2	0.017	0.000	0.93	
CL2	10.5	0.329	461.2	1236.8	0.014	0.000	0.94	
CL2	11.5	0.289	404.1	1304.4	0.012	0.000	0.95	
CL2	12.5	0.254	356.0	1372.0	0.010	0.000	0.96	
CL2	13.5	0.225	315.3	1439.6	0.009	0.000	0.97	
CL2	14.5	0.201	280.8	1507.2	0.008	0.000	0.98	
CL2	15.5	0.179	251.2	1574.8	0.007	0.000	0.99	
CL2	16.5	0.161	225.9	1642.4	0.006	0.000	0.99	
CL2	17.5	0.146	204.0	1710.0	0.005	0.000	1.00	
CL2	18.5	0.132	185.1	1777.6	0.004	0.000	1.00	
CL2	19.5	0.120	168.5	1845.2	0.004	0.000	1.00	
CL2	20.5	0.110	154.0	1912.8	0.003	0.000	1.01	
CL2	21.5	0.101	141.3	1980.4	0.003	0.000	1.01	<---2B
CL2	22.5	0.093	130.0	2048.0	0.003	0.000	1.01	

23522 Settlement--Footings

SETTLEMENT OF FOOTINGS								
Project:	Edgewater Townhomes, #23522 (Based on B-2 soil profile)							
B:	5.71429	feet (width or diameter)			b =	2.857143	ft (1/2 width/dia)	
L:	25	feet (length)			l =	12.5	ft (1/2 length)	
foot. depth:	2.5	feet					Spread Load,k:	150
unit weight:	119	pcf (above footing depth)					Strip Load,k:	8
allowable q:	1400	psf						
footing type:	1	(1=strip,2&3=square/rect.,4=circular)						
	4	(4 for center, 1 for corner of square/rect.)						
water depth:	7.5	feet						

DEFINE SOIL PROFILE:			preconsol		Density	Collapse	Below ftg.	Avg.
Soil type	C_c'	C_r'	press.,σ_c'(psf)	OCR	(pcf)	(%)	depth (ft)	OCR
Fill	0.01	0.00125			135		0.0	1.00
CL1	0.049	0.0086		4	119		2.0	4.00
CH	0.098	0.0342	3000		119		7.5	3.48
CL2	0.049	0.0086	3600		130		22.5	2.34

STRIP FOOTINGS...

Soil Type	Below ftg. depth (ft)	Influence	Increased Stress (psf)	avg. ovrbn. press.(psf)	Incremnt. Sett. (in.)	Collapse Sett. (in.)	Total Set. (in.)	
Fill	0	0.000	0.0	297.5	0.000	0.000	0.00	
CL1	1	0.984	1377.8	416.5	0.081	0.000	0.08	
CL1	2	0.910	1274.4	535.5	0.055	0.000	0.14	
CH	3	0.802	1123.4	654.5	0.178	0.000	0.31	
CH	4	0.696	974.4	773.5	0.145	0.000	0.46	
CH	5	0.605	846.6	892.5	0.119	0.000	0.58	
CH	6	0.530	742.1	949.1	0.103	0.000	0.68	
CH	7	0.469	657.2	1005.7	0.090	0.000	0.77	
CH	7.5	0.444	620.9	1034.0	0.042	0.000	0.81	
CL2	8.5	0.399	558.2	1101.6	0.018	0.000	0.83	
CL2	9.5	0.362	506.2	1169.2	0.016	0.000	0.85	
CL2	10.5	0.330	462.6	1236.8	0.014	0.000	0.86	
CL2	11.5	0.304	425.6	1304.4	0.013	0.000	0.87	<---2B
CL2	12.5	0.281	393.9	1372.0	0.011	0.000	0.89	
CL2	13.5	0.262	366.4	1439.6	0.010	0.000	0.90	
CL2	14.5	0.245	342.5	1507.2	0.009	0.000	0.90	
CL2	15.5	0.230	321.4	1574.8	0.008	0.000	0.91	
CL2	16.5	0.216	302.7	1642.4	0.008	0.000	0.92	
CL2	17.5	0.204	286.0	1710.0	0.007	0.000	0.93	
CL2	18.5	0.194	271.0	1777.6	0.006	0.000	0.93	
CL2	19.5	0.184	257.5	1845.2	0.006	0.000	0.94	
CL2	20.5	0.175	245.3	1912.8	0.005	0.000	0.94	
CL2	21.5	0.167	234.1	1980.4	0.005	0.000	0.95	
CL2	22.5	0.160	224.0	2048.0	0.005	0.000	0.95	

23522 Settlement--Footings

SETTLEMENT OF FOOTINGS								
Project:	Edgewater Townhomes, #23522 (Based on B-2 soil profile)							
B:	10	feet (width or diameter)			b =	5	ft (1/2 width/dia)	
L:	10	feet (length)			l =	5	ft (1/2 length)	
foot. depth:	2.5	feet					Spread Load,k:	150
unit weight:	119	pcf (above footing depth)					Strip Load,k:	8
allowable q:	1500	psf						
footing type:	2	(1=strip,2&3=square/rect.,4=circular)						
	4	(4 for center, 1 for corner of square/rect.)						
water depth:	7.5	feet						

DEFINE SOIL PROFILE:			preconsol		Density	Collapse	Below ftg.	Avg.
Soil type	C_c'	C_r'	press.,σ_c'(psf)	OCR	(pcf)	(%)	depth (ft)	OCR
Fill	0.01	0.00125			135		1.5	1.00
CL1	0.049	0.0086		4	119		2.0	4.00
CH	0.098	0.0342	3000		119		7.5	3.24
CL2	0.049	0.0086	3600		130		22.5	2.24

SQUARE/RECTANGULAR FOOTINGS (Boussinesq Method)...

Soil Type	Below ftg. depth (ft)	Influence	Increased Stress (psf)	avg. ovrbn. press.(psf)	Incremnt. Sett. (in.)	Collapse Sett. (in.)	Total Set. (in.)	
Fill	1	0.994	1491.4	432.5	0.078	0.000	0.08	
Fill	1.5	0.982	1472.8	500.0	0.036	0.000	0.11	
CL1	2	0.960	1440.6	559.5	0.029	0.000	0.14	
CH	3	0.892	1337.3	678.5	0.194	0.000	0.34	
CH	4	0.800	1199.6	797.5	0.164	0.000	0.50	
CH	5	0.701	1051.3	916.5	0.136	0.000	0.64	
CH	6	0.606	909.7	973.1	0.118	0.000	0.75	
CH	7	0.522	783.0	1029.7	0.101	0.000	0.85	
CH	7.5	0.484	726.2	1058.0	0.047	0.000	0.90	
CL2	8.5	0.417	625.7	1125.6	0.020	0.000	0.92	
CL2	9.5	0.361	541.1	1193.2	0.017	0.000	0.94	
CL2	10.5	0.314	470.3	1260.8	0.014	0.000	0.95	
CL2	11.5	0.274	411.1	1328.4	0.012	0.000	0.96	
CL2	12.5	0.241	361.4	1396.0	0.010	0.000	0.97	
CL2	13.5	0.213	319.6	1463.6	0.009	0.000	0.98	
CL2	14.5	0.189	284.1	1531.2	0.008	0.000	0.99	
CL2	15.5	0.169	253.9	1598.8	0.007	0.000	1.00	
CL2	16.5	0.152	228.0	1666.4	0.006	0.000	1.00	
CL2	17.5	0.137	205.8	1734.0	0.005	0.000	1.01	
CL2	18.5	0.124	186.5	1801.6	0.004	0.000	1.01	
CL2	19.5	0.113	169.7	1869.2	0.004	0.000	1.02	
CL2	20.5	0.103	155.0	1936.8	0.003	0.000	1.02	<---2B
CL2	21.5	0.095	142.1	2004.4	0.003	0.000	1.02	
CL2	22.5	0.087	130.7	2072.0	0.003	0.000	1.03	

23522 Settlement--Footings

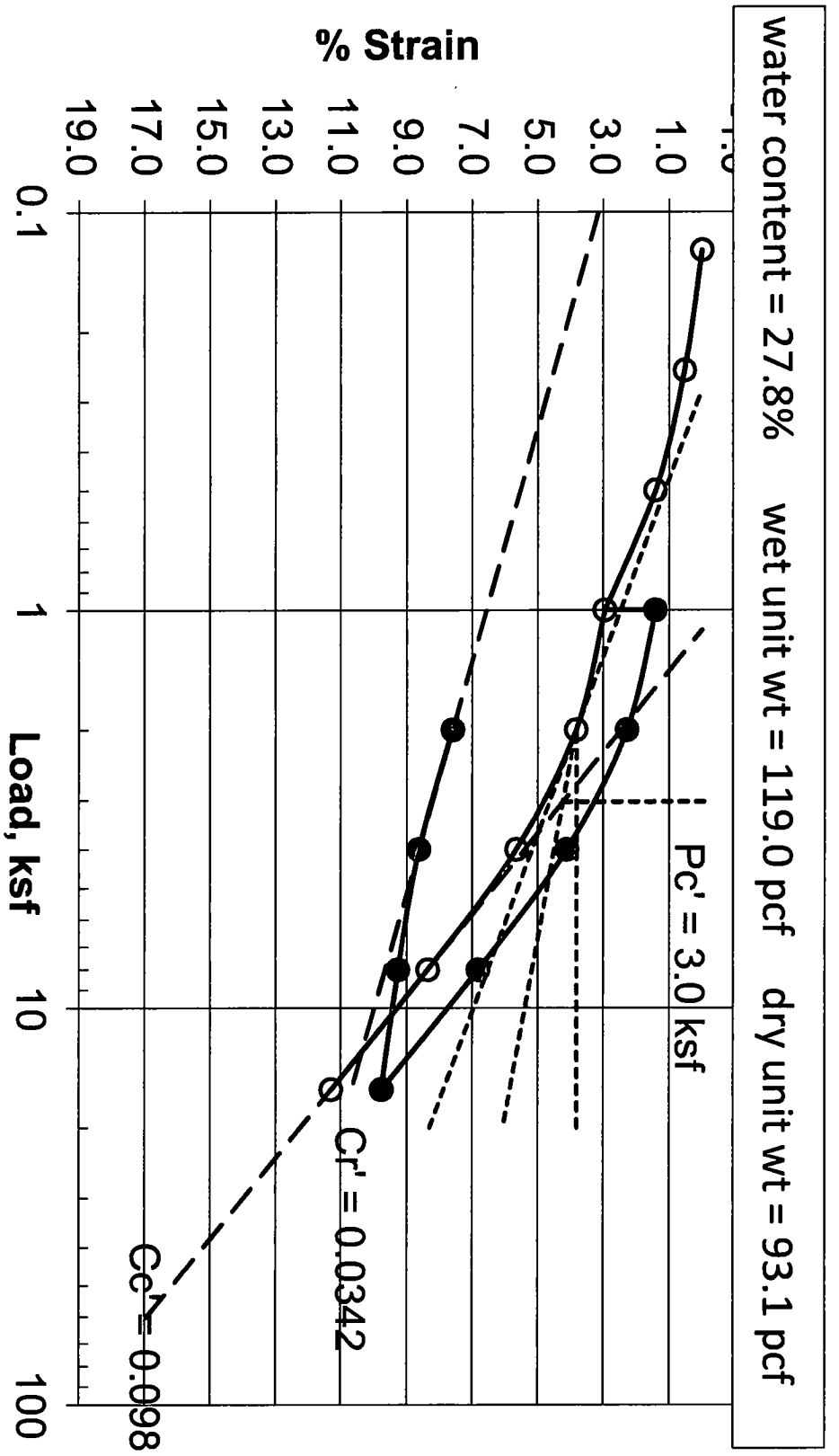
SETTLEMENT OF FOOTINGS								
Project:	Edgewater Townhomes, #23522 (Based on B-2 soil profile)							
B:	5.33333	feet (width or diameter)			b =	2.666667	ft (1/2 width/dia)	
L:	25	feet (length)			l =	12.5	ft (1/2 length)	
foot. depth:	2.5	feet					Spread Load,k:	150
unit weight:	119	pcf (above footing depth)					Strip Load,k:	8
allowable q:	1500	psf						
footing type:	1	(1=strip,2&3=square/rect.,4=circular)						
	4	(4 for center, 1 for corner of square/rect.)						
water depth:	7.5	feet						

DEFINE SOIL PROFILE:			preconsol		Density	Collapse	Below ftg.	Avg.
Soil type	C_c'	C_r'	press.,σ_c'(psf)	OCR	(pcf)	(%)	depth (ft)	OCR
Fill	0.01	0.00125			135		1.5	1.00
CL1	0.049	0.0086		4	119		2.0	4.00
CH	0.098	0.0342	3000		119		7.5	3.24
CL2	0.049	0.0086	3600		130		22.5	2.24

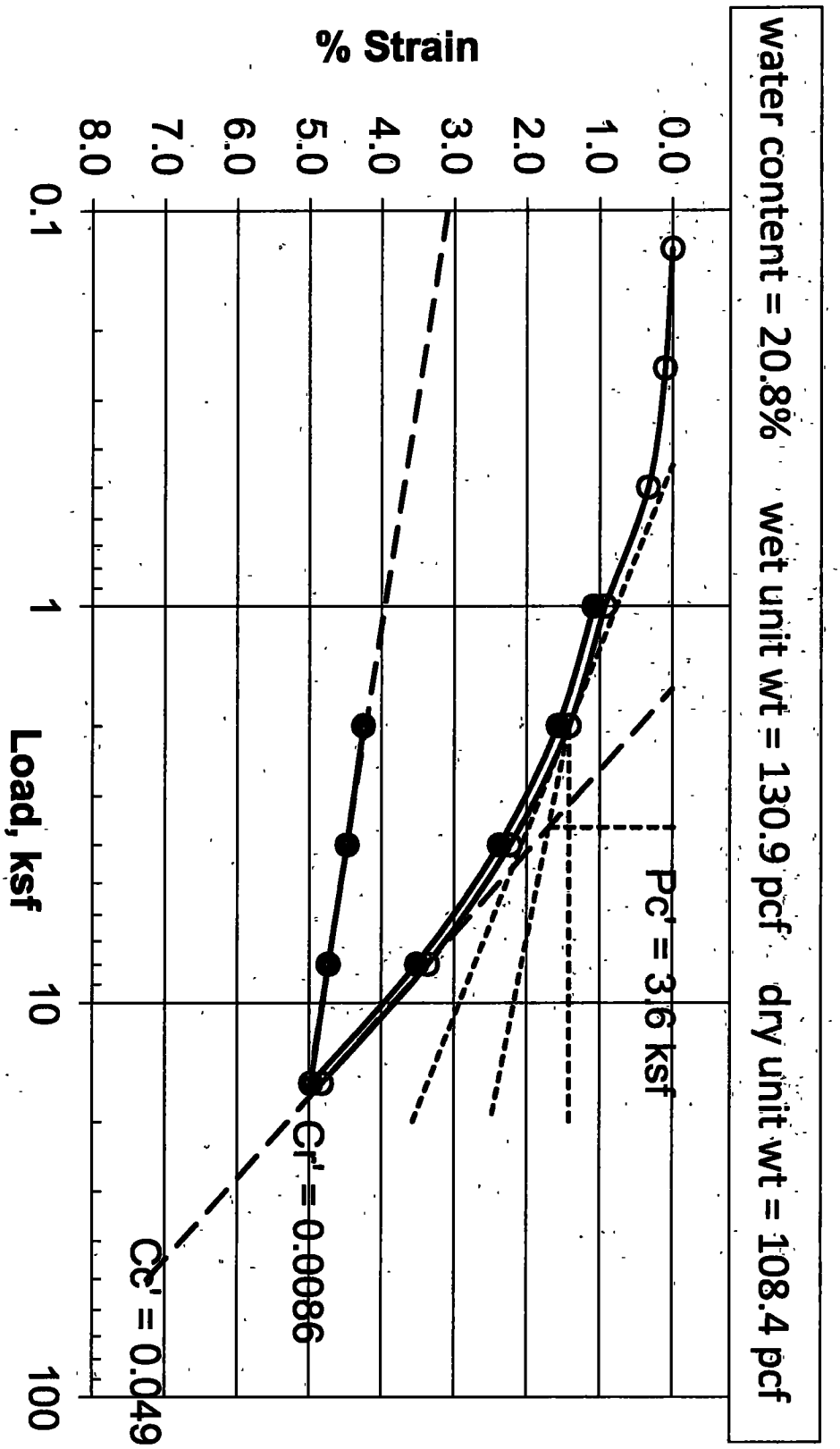
STRIP FOOTINGS...

Soil Type	Below ftg. depth (ft)	Influence	Increased Stress (psf)	avg. ovrbn. press.(psf)	Incremnt. Sett. (in.)	Collapse Sett. (in.)	Total Set. (in.)	
Fill	1	0.981	1471.3	432.5	0.077	0.000	0.08	
Fill	1.5	0.946	1418.7	500.0	0.035	0.000	0.11	
CL1	2	0.896	1343.9	559.5	0.027	0.000	0.14	
CH	3	0.779	1168.1	678.5	0.178	0.000	0.32	
CH	4	0.668	1002.2	797.5	0.145	0.000	0.46	
CH	5	0.576	864.4	916.5	0.118	0.000	0.58	
CH	6	0.503	753.8	973.1	0.102	0.000	0.68	
CH	7	0.444	665.3	1029.7	0.089	0.000	0.77	
CH	7.5	0.418	627.6	1058.0	0.042	0.000	0.81	
CL2	8.5	0.375	563.0	1125.6	0.018	0.000	0.83	
CL2	9.5	0.340	509.8	1193.2	0.016	0.000	0.85	
CL2	10.5	0.310	465.3	1260.8	0.014	0.000	0.86	
CL2	11.5	0.285	427.7	1328.4	0.013	0.000	0.87	<---2B
CL2	12.5	0.264	395.6	1396.0	0.011	0.000	0.89	
CL2	13.5	0.245	367.8	1463.6	0.010	0.000	0.90	
CL2	14.5	0.229	343.6	1531.2	0.009	0.000	0.91	
CL2	15.5	0.215	322.3	1598.8	0.008	0.000	0.91	
CL2	16.5	0.202	303.4	1666.4	0.007	0.000	0.92	
CL2	17.5	0.191	286.6	1734.0	0.007	0.000	0.93	
CL2	18.5	0.181	271.6	1801.6	0.006	0.000	0.93	
CL2	19.5	0.172	258.0	1869.2	0.006	0.000	0.94	
CL2	20.5	0.164	245.7	1936.8	0.005	0.000	0.95	
CL2	21.5	0.156	234.5	2004.4	0.005	0.000	0.95	
CL2	22.5	0.150	224.3	2072.0	0.005	0.000	0.95	

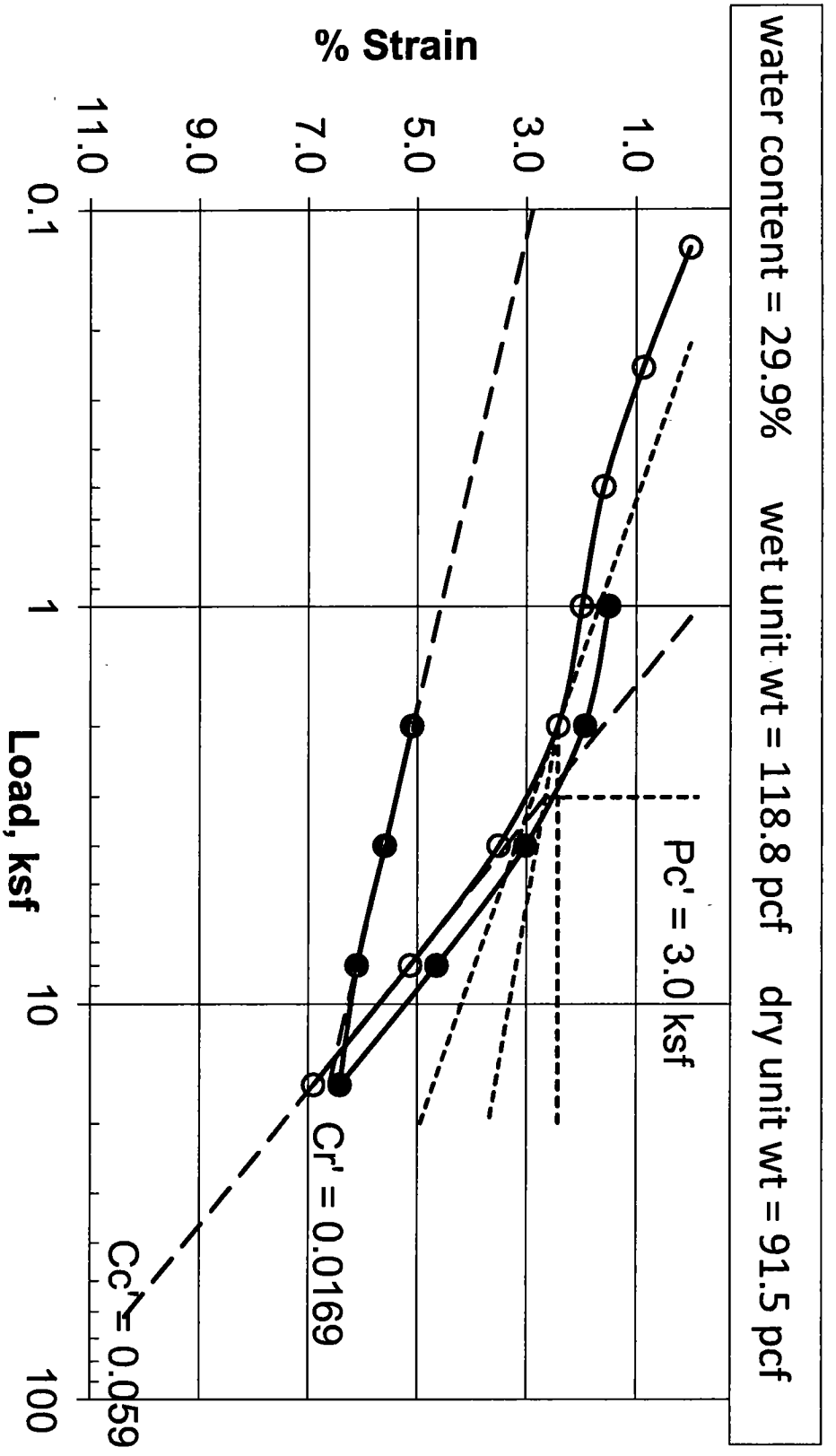
Edgewater Townhomes: B-2 at 7.5 ft: Water added at 1 ksf: Swell=1.5%; P'c (strain-energy method) =2.5 ksf



Edgewater Townhomes: B-12 at 15 ft: Water added at 1 ksf: Collapse=0.2%; P'c (strain-energy method) =3.3 ksf



Edgewater Townhomes: B-14 at 5 ft: Water added at 1 ksf: Swell=0.5%; P'c (strain-energy method) =2.3 ksf



LATERAL EARTH PRESSURES

	ENTER					
Project:	Edgewater Townhomes, #23522					
Density of water:	62.4	pcf				
Internal Friction Angle of Soil:	26	deg.	=	0.453785606	rad.	0.325155059
Angle of Soil Backfill (from horiz.):	0	deg.	=	0	rad.	
Friction angle of soil/wall interface:	13	deg.	=	0.226892803	rad.	
Angle of back of wall (from VERT.):	0	deg.	=	0	rad.	1.570796327
Angle of front of wall (from VERT.):	0	deg.	=	0	rad.	
Density of soil (above water):	120	pcf				
Horizontal Acceleration:	0.32	g	=>	0.305160825	(theta, radians, for k_v = 0)	
Height of Wall, H:	4	feet				

CALCULATIONS

AT REST K_o =	0.562					
At Rest Pressure =	67	psf/ft above water	=	95	psf/ft below water	
Rankine K_a =	0.390					
Rankine K_p =	2.561					
Rankine Active Pressure =	47	psf/ft above water	=	85	psf/ft below water	
Rankine Passive Pressure =	307	psf/ft above water	=	210	psf/ft below water	
Mononobe-Okabe Seismic K_{ae} =	0.67					
Mononobe-Okabe Seismic K_{pe} =	2.64					
M.-O. Seismic Active Pressure =	81	psf/ft above water	=	101	psf/ft below water	
M.-O. Seismic Passive Pressure=	317	psf/ft above water	=	215	psf/ft below water	
Dynamic Active Pressure ONLY =	34	psf/ft above water	=	18	psf/ft below water	
Dynamic Passive Press. ONLY =	10	psf/ft above water	=	66	psf/ft below water	

Ultimate Coefficient of Friction =	0.48773	
Allowable Coefficient of Friction (FS=1.5) =	0.32516	
Ultimate Coefficient of Friction Structural Fill =	0.67451	(using an assumed friction angle of 34°)
Allowable Coefficient of Friction (FS=1.5) =	0.44967	

Bill Turner

From: bill.turner@cmttechnicalservices.com
Subject: FW: Highline/Edgewater THs - 3rd Party Geotech Review

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From: Kaytlin Blanco <kaytlin.blanco@yorkengineering.com>
Sent: Wednesday, July 16, 2025 1:13 PM
To: Toby Cordova <Toby.Cordova@centurycommunities.com>
Cc: Braden Cooper <Braden.Cooper@centurycommunities.com>
Subject: Re: Highline/Edgewater THs - 3rd Party Geotech Review

Hey Toby,

I just ran through those calculations from ASCE 7-22 12.8.2 and per the calculations, the approximate fundamental period is 0.22 second which is well below the 0.7 seconds. If you need anything else, please let me know.

Thanks,

Kaytlin Blanco, EIT
801-218-2411
Kaytlin.Blanco@YorkEngineering.com
York Engineering
Approachable, Practical & Efficient

From: Toby Cordova <Toby.Cordova@centurycommunities.com>
Sent: Wednesday, July 16, 2025 11:41 AM
To: Kaytlin Blanco <kaytlin.blanco@yorkengineering.com>
Cc: Braden Cooper <Braden.Cooper@centurycommunities.com>
Subject: Highline/Edgewater THs - 3rd Party Geotech Review

Hello Kaytlin,

I am following up on my voice message with this email.

The city of American Fork has invited a third party Geotech firm (Taylor Geotechnical - TG) to review the existing Geotech report from Bill Tuner at CMT Technical Engineering for the Edgewater/Highline THs project. One of TG's comments is asking us to verify "if the period of the proposed building is greater than (or less than) 0.70 seconds". Our desire is that it is less than 0.70 seconds, otherwise CMT will need to perform additional fieldwork that will take approx. 30 days to complete. Let us know what your calcs include.

See snapshot from the attached letter below:

Based on the requirements of the City Sensitive Land Ordinance and the technical documentation provided by CMT, TG recommends the City not consider the CMT submittal complete from a geotechnical engineering perspective until the following items are adequately addressed.

1. **Section 4.3.2 Ground Motions (page 8) of the January 2, 2025, CMT document states:**

   "As shown in the response spectrum above, if the period of the proposed building is greater than 0.70 seconds, a site-specific ground motion hazard analysis (GMHA) is required. If this situation applies, please contact CMT for a proposal to perform the GMHA. Otherwise, the exception values given above may be used for design."

   TG recommends the City request CMT determine if a structural engineer has been retained for the proposed project and, if so, provide verification from the structural engineer of the fundamental period for the proposed structure. If the fundamental period is greater than 0.7 seconds, then CMT should provide a site response analysis to the City for review.

Time is of the essence, so thanks for your immediate attention to this message.

Toby Cordova
Forward Planning & Entitlement Manager
Utah Division

Direct: 801.341.2716
Cell: 801.349.5417

Email: Toby.Cordova@centurycommunities.com

CENTURY COMMUNITIES

CCS LISTED NYSE

10644 S Jordan Gateway Suite 300 South Jordan, UT 84095
www.centurycommunities.com

EXHIBIT "C" -
SITE GRADING PLAN