GEOTECHNICAL EXPLORATION REPORT
NEW TK/K CLASSROOM BUILDING AND LIBRARY
ROOSEVELT ELEMENTARY SCHOOL
801 MONTANA AVENUE
SANTA MONICA, LOS ANGELES COUNTY
CALIFORNIA

Prepared For

SANTA MONICA-MALIBU
UNIFIED SCHOOL DISTRICT
2828 FOURTH STREET
SANTA MONICA, CALIFORNIA 90405-4308

Prepared By

LEIGHTON CONSULTING, INC.
2600 MICHELSON DRIVE, SUITE 400
IRVINE, CALIFORIA 92612-6540

Project No. 11428.048

November 29, 2023

Leighton
a verdantas company

Leighton Consulting, Inc.

November 27, 2023

Project No. 11428.048

Santa Monica-Malibu Unified School District
2828 Fourth Street
Santa Monica, California 90405-4308

Attention: Mrs. Barbara Chiavelli

Subject: Geotechnical Exploration Report
Proposed New TK-K Classroom and Library Buildings
Roosevelt Elementary School
801 Montana Avenue
Santa Monica, Los Angeles County, California

Per our July 17, 2023 proposal, authorized on September 20, 2023; Leighton Consulting, Inc. (Leighton) is pleased to present this geotechnical exploration report for the subject project. This report is intended to meet requirements of Section 1803A.2 of the 2022 California Building Code (CBC) and the CGS's Note 48 checklist for review of engineering geology and seismology reports for California public schools.

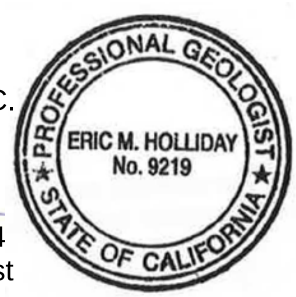
This site is **not** located within a currently designated Alquist-Priolo Special Studies Zone for surface fault rupture. This site is **not** located within a currently designated liquefaction hazard zone. As is the case for most of Southern California, strong ground shaking has and will occur at this site.

Specific recommendations for site grading, foundations, and other geotechnical aspects of the project are presented in this report.

We appreciate this opportunity to be of service. If you have any questions regarding this report or if we can be of further service, please call us at your convenience at **(866) *LEIGHTON***, directly at the phone extensions or e-mail addresses listed below.

Respectfully submitted,

LEIGHTON CONSULTING, INC.



Eric M. Holliday, PG, CEG 2774
Associate Engineering Geologist
Ext 4252; eholliday@leightongroup.com

Carl Kim, PE, GE 2620
Senior Principal Engineer
Ext 1682; ckim@leightongroup.com

EMH/ CK/bmm

TABLE OF CONTENTS

Section **Page**

Section Page

TABLES

LIST OF ATTACHMENTS

1.0 INTRODUCTION

1.1 Site Description and Proposed Development

Roosevelt Elementary is a kindergarten through 5th grade school located at 801 Montana Avenue in the City of Santa Monica, situated within a residential and commercial neighborhood. The school campus location (latitude 34.0283°, longitude -118.5006°) and immediate vicinity are shown on Figure 1, *Site Location Map*.

The campus is a rectangular parcel of land developed with one- and two-story classroom buildings, tennis/basketball courts, a playfield, an asphalt concrete (AC) blacktop, and an AC parking lot. The campus is bounded on the northwest by Alta Avenue, the northeast by 9th Street, the southeast by Montana Avenue, and the southwest by Lincoln Boulevard. According to the United States Geological Survey (USGS) 7.5-Minute Beverly Hills Quadrangle (USGS, 1999) and 7.5-Minute Topanga Quadrangle (USGS, 1991), the campus surface is relatively flat at approximately Elevation (El.) +175 to +190 feet mean sea level (msl).

Review of historical aerial photos extending back to 1947 (NETR, 2023) indicate the campus was constructed prior to the late 1940's. In 1947, the bulk of the main classrooms in the southeast portion of the campus had already been constructed and what appears to be an L-shaped structure was located in the northwest corner of the campus at the location of the currently existing tennis/basketball courts. By 1952, the L-shaped structure appears to have been demolished or buried, and by 1972 the tennis courts appear in the location they are today. Between 1972 to 2000, improvements including new classrooms, pavement, and play fields were constructed. By 2003, the campus looked like the layout existing today.

The proposed project site is located at the southeastern corner of the property along 9th street and Montana Avenue, and is currently occupied by a classroom building, playground, shade structure, and a lawn area. We understand the development conceptually consists of seven (7) new 1,350-square-foot, single-story classroom buildings with outdoor learning spaces; a new 1,500-square-foot teacher workroom and restroom building; and a new 6,000-square-foot library. Ancillary improvements include a new play area, courtyard, entrances on 9th Street and Montana Avenue, new pavement, landscaping, and utility infrastructure.

The approximate footprint of the proposed development is shown on Figure 2, *Exploration Location Map.*

1.2 Purpose and Scope of Exploration

The purpose of our geotechnical exploration was to evaluate the soil and groundwater conditions at the project site through review of available data and subsurface explorations to provide geotechnical recommendations to aid in design and construction for the project as currently proposed. The scope of this geotechnical exploration included the following tasks:

- ***Background Review*** – A background review was performed of readily available geotechnical and geologic documents pertinent to the project site. Documents reviewed in preparation of this report are listed in Section 8.0, References.

- ***Field Exploration*** – Our field exploration, performed on September 23 and September 25, 2023, consisted of drilling four (4) hollow-stem auger borings (designated LB-1 through LB-4) drilled to approximate depths ranging from of 31½ to 51½ feet below ground surface (bgs). In addition, four (4) hand-auger soil borings (designated HA-1 through HA-4) were each advanced to approximate depths of 5 to 10 feet bgs.

  Prior to the field exploration, the borings were marked at the site and Underground Service Alert was notified for utility clearance.

  During drilling of the hollow-stem and hand-auger borings, bulk and relatively undisturbed drive samples were obtained for geotechnical laboratory testing. Relatively undisturbed samples were collected from the hollow-stem auger borings using a Modified California Ring sampler conducted in accordance with ASTM Test Method D3550 and hand driven ring samples were collected from the hand auger borings. Standard Penetration Tests (SPT) were also performed within the hollow-stem auger borings in accordance with ASTM Test Method D1586. In general, the samplers advanced in the hollow-stem auger borings were driven for a total penetration of 18 inches, unless practical refusal was encountered, using a 140-pound automatic hammer falling freely for 30 inches. The number of blows per 6 inches of penetration was recorded on the boring logs.

  The borings were logged in the field by a member of our technical staff under the direct supervision of a State of California Certified Engineering Geologist. Each soil sample collected was reviewed and described in accordance with the Unified Soil Classification System (USCS). The samples were sealed and packaged for transportation to our laboratory. After completion of drilling, all of the borings were backfilled with excess soils generated during the exploration and patched at the surface to match the existing conditions. The boring logs are presented in Appendix A, *Exploration Logs*. The approximate locations of the explorations are shown on Figure 2.

- ***Laboratory Testing*** – Geotechnical laboratory tests were conducted on selected bulk and undisturbed soil samples obtained from our borings. This laboratory testing program was designed to evaluate geotechnical (physical) characteristics of site soil. A description of geotechnical laboratory test-procedures and results are presented in Appendix B, *Laboratory Test Results*. The following laboratory tests were performed:

  — In-situ Moisture Content and Dry Density (ASTM D2216 and ASTM D2937);

  — Expansion Index (ASTM D4829);

  — Modified Proctor Compaction Test (ASTM D1557);

  — Direct Shear (ASTM D 3080);

  — R Value (DOT CA Test 301);

  — Consolidation (ASTM D2435); and

  — Corrosivity (Soluble Sulfate ASTM C1580, Soluble Chloride ASTM C1411-09, pH ASTM D4972, and Resistivity ASTM G187-12a).

  The in-situ moisture and density of soil samples are shown on the borings logs included in Appendix A. The results of the remaining laboratory tests are presented in Appendix B.

- ***Engineering Analysis*** – Data obtained from field explorations and geotechnical laboratory testing was evaluated and analyzed to develop geotechnical conclusions and provide recommendations in accordance with the 2022 California Building Code and the California Geological Survey's (CGS) Note 48. Subsurface interpretations prepared for this campus are presented on Figure 3, *Geotechnical Cross Sections AA' and BB.'*

- ***Report Preparation*** - Results of our geologic hazards review and geotechnical exploration have been summarized in this report, presenting our findings, conclusions and geotechnical design recommendations for design and construction of the new TK-K Classroom and Library buildings as currently proposed.

It should be noted that the recommendations in this report are subject to the limitations presented in Section 7.0 of the report.

2.0 GEOTECHNICAL FINDINGS

2.1 Geologic Setting

The site is in the Santa Monica Plain, an uplifted and inclined alluvial surface within the southwestern block of the Los Angeles Basin (Hoots, 1931; Poland and Piper, 1956). The Los Angeles Basin (Basin), a structural trough, is a northwest-trending, alluviated lowland plain approximately 50 miles long and 20 miles wide. Mountains and hills that generally expose Late Cretaceous to Late Pleistocene-age sedimentary and igneous rocks bound the Basin along the north, northeast, east and southeast (Yerkes, 1965). The Basin is part of the Peninsular Ranges geomorphic province of California characterized by sub parallel blocks sliced longitudinally by young, steeply dipping northwest-trending fault zones. The Basin, located at the northerly terminus of the Peninsular Ranges, is the site of active sedimentation and the strata are interpreted to be as much as 31,000 feet thick in the center of the synclinal trough of the Central Block of the Los Angeles Basin.

The Santa Monica Plain formed during the Pleistocene epoch by continental aggradation and has since been uplifted and heavily incised by both current and former drainage patterns (Hoots, 1931). As shown on Figure 4, *Regional Geology Map,* the area of the Santa Monica Plain where the Roosevelt Elementary School campus is located is mapped as being underlain by Quaternary old (Pleistocene age) alluvial fan deposits.

2.2 Local Geologic Units and Subsurface Conditions

Presented below are brief descriptions of the geologic units encountered in the exploratory borings completed at the site by Leighton. Detailed descriptions of the geologic units encountered are presented on the boring logs in Appendix A. Geotechnical conditions described on the logs represent the conditions at the actual exploratory excavation locations. Other variations may occur beyond and/or between the excavations. Lines of demarcation between the geologic units and the various earth materials on the logs represent approximated boundaries, and (unless otherwise noted) actual transitions may be gradual. The locations of the subsurface explorations are shown on Figure 2 and subsurface profiles based on data obtained and interpreted from the borings are shown on Figure 3.

Local geology was interpreted from published regional geologic maps of the area (Yerkes and Campbell, 2005; Dibblee, 1991). A relatively thin mantle of artificial fill (Afu) materials were encountered within each of the exploratory borings. Native geologic units underlying the artificial fill materials consist of Quaternary old alluvial fan deposits (map symbol: Qof), correlative to Dibblee's (DF-31, 1991 and DF-35, 1992) Quaternary old marine and partly non-marine sediments derived from the Santa Monica Mountains.

Undocumented Artificial Fill (Map Symbol: Afu): Artificial fill materials were predominantly encountered to depths of approximately 2 to 5 feet bgs. Fill, as encountered, is characterized as brown to reddish brown silty clay, sandy clay, clayey sand with varying proportions of gravel. No documentation or records related to fill placement was available at the time of this report preparation. Therefore, for purposes of this report, all fill encountered onsite and anticipated in future explorations is considered undocumented and unsuitable for support of new improvements in its current condition.

Quaternary Old Alluvial Fan Deposits (Map Symbol: Qof): The Pleistocene age deposits encountered directly beneath the artificial fill materials generally consist of medium to dark brown, medium to very stiff, silty to sandy lean clay with gravel to a depth of 15 to 25 feet bgs. At depth, the alluvial deposits grade coarser to include beds of medium dense to dense silty sand with gravel and sandy gravel. Isolated beds of loose silty sand were identified in borings LB-3 and LB-4 at depths of 30 and 20 feet bgs, respectively.

The stratigraphy of the subsurface soils encountered in each soil boring is presented in the boring logs (Appendix A). The general subsurface conditions across the site, interpreted from the boring data are shown on Figure 3.

2.3 Corrosion

Corrosion: In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor for ferrous corrosivity.

Based on findings of studies presented in the American Society for Testing and Materials (ASTM) STP 1013 titled "Effects of Soil Characteristics on Corrosion" (February, 1989), an approximate relationship between soil resistivity and soil corrosiveness was developed as shown in Table 1 below.

Table 1 - Soil Corrosivity as a Function of Resistivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very severe corrosion
900 to 2,300	Severely corrosive
2,300 to 5,000	Moderately corrosive
5,000 to 10,000	Mildly corrosive
10,000 to >100,000	Very mildly corrosive

Sulfate Exposure: Sulfate ions in the soil can lower the soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. A potentially high sulfate content could also cause corrosion of reinforcing steel in concrete. Section 1904A of the 2019 California Building Code (CBC) defers to the American Concrete Institute's (ACI's) ACI 318-14 for concrete durability requirements.

Table 19.3.1.1 of ACI 318-14 lists "*Exposure categories and classes*," including sulfate exposure as follows:

Table 1A - Sulfate Concentration and Exposure

Soluble Sulfate in Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	ACI 318-14 Sulfate Class
0-150	0.00 - 0.10	S0 (negligible)
150-1,500	0.10 - 0.20	S1 (moderate*)
1,500-10,000	0.20 - 2.00	S2 (severe)
>10,000	>2.00	S3 (very severe)

*or seawater

Two representative composite, near surface (0-5 feet) bulk soil samples collected from LB-1 and LB-4 were tested to evaluate corrosion potential. The chemical analysis test results for the onsite soil from our geotechnical exploration are included in Appendix B of this report and are summarized below.

Table 2 - Corrosivity Test Results

Test Parameter	Test Results		General Classification of Hazard
	LB-1 0-5'	LB-4 0-5'	
Water-Soluble Sulfate-SO_4 in Soil (ppm)	305	189	Moderate sulfate exposure to buried concrete
Water-Soluble Chloride in Soil (ppm)	40	60	Non-corrosive to buried concrete (per Caltrans Specifications)
pH	7.38	6.87	Mildly alkaline to Mildly acidic
Minimum Resistivity (saturated, ohm-cm)	2240	3040	Moderately corrosive to buried ferrous pipes

Additional corrosion testing is recommended upon completion of grading to confirm the findings and conclusions presented above.

2.4 Expansive Soils

Expansion Index (EI) testing of two representative bulk samples collected from borings LB1 and LB-4 within the upper 5 feet indicate an expansion index (EI) between 0 and 18, corresponding to a very low potential for expansion. For purposes of this report, the expansion properties of the soil below the proposed new classroom may be considered as very low.

Based on geotechnical laboratory testing performed on selected soil samples collected from the site and review of previous laboratory test results, a synopsis of geotechnical properties of the site soils is provided in Table 3 below. Geotechnical laboratory testing results are presented in Appendix B.

Table 3 – Soil Geotechnical Properties Synopsis

Parameters	Soil Properties
In-situ Moisture:	Slightly moist to moist
In-situ Density:	Medium stiff to very stiff/Medium dense to very dense
Swell/Expansion Potential:	Swell/expansion potential is **very low to low.**
Collapse Potential:	Not susceptible to collapse when wetted
Strength:	Adequate to provide structural support
Corrosivity:	Moderate sulfate attack of concrete; moderately corrosive to ferrous metals.

2.5 Groundwater

Groundwater was encountered in Boring LB-1 at a depth of approximately 47 feet bgs. Historic groundwater levels, as interpreted from the Topanga and Beverly Hills 7.5 Minute Quadrangles, Los Angeles County, California (CGS, 1998) indicate historic high groundwater at a level of approximately 40 to 50 feet bgs.

Review of environmental data reported through the State Water Resources Control Board (see http://geotracker.waterboards.ca.gov/) shows that a series of eight monitoring wells were installed in association with a leaking underground storage tank remediation at Providence St. Johns medical Center; located approximately 1¼ miles east of the project site. Groundwater levels as measured within these monitoring wells was documented at depths ranging from approximately 110 to 132 feet bgs. Groundwater is not expected to pose a constraint to the proposed development as currently planned.

3.0 GEOLOGIC/SEISMIC HAZARDS

Geologic and seismic hazards include surface fault rupture, seismic shaking, liquefaction, seismically-induced settlement, lateral spreading, seismically-induced landslides, flooding, seismically-induced flooding, seiches and tsunamis. The following sections discuss these hazards and their potential impact at the project site.

3.1 Faulting

Based on our site reconnaissance and review of available geologic literature and aerial photographs, we find no evidence that suggests active faults have been mapped across the site, and the site is **not** located within a currently established *Alquist-Priolo (AP) Earthquake Fault Zone* (Bryant and Hart, 2007, CGS, 2018). The limit of the AP Zone for the Santa Monica Fault Zone (SMFZ), as mapped by CGS (2018), is located approximately 950 feet northwest of the Roosevelt Elementary School Campus. The AP Zone was established based on recommendations provided in the Fault Evaluation Report 259 (FER 259) prepared by CGS and dated June 28, 2017 (CGS, 2017). Therefore, a fault hazard assessment is not mandated by the State for the proposed campus development.

Several active and potentially active faults are mapped within approximately 10 miles (16 km) of the site. Figure 5, *Regional Fault and Historical Seismicity Map*, shows the proximity of known active and potentially active faults within the region.

Santa Monica Fault: The California Geological Survey (CGS, 2018) has zoned the Santa Monica Fault, which is the closest known fault to the site, at a distance of approximately 1000 feet (0.2 mile) northwest of the site. This fault zone trends southeast-northwest along the southern boundary of the Santa Monica Mountains for more than 24.8 miles (40 km) and is included in the Transverse Ranges Southern Boundary fault system, which consists of east-west trending, left-lateral and oblique-reverse movements along several active faults accommodating westward motion of the Transverse Ranges (Dolan *et al*., 1997). Pleistocene or Holocene movement has been postulated, but not directly proven along some upper plate secondary fault segments related to the SMFZ (Dolan *et al.*, 2000). Recurrence interval and recency of movement along many fault segments are neither well documented nor understood, mainly because intense urbanization has modified or destroyed any surface traces of the fault (Hill *et al*., 1979). Southern California Earthquake Center (SCEC) identifies the most recent rupture as Late Quaternary with intervals between events unknown.

Malibu Coast Fault: Located approximately 1.4 miles (2.3 km) northeast of the project site. The fault exhibits left-lateral oblique displacement, with a reported vertical slip rate component of about 0.4 millimeter per year (Lajoie et al., 1979) and a horizontal slip rate component of 0.3 millimeter per year (Petersen et al., 1996). The entire 23-mile-long fault zone is considered to be a potential source in the present statewide probabilistic seismic hazard model and is considered capable of generating a maximum magnitude earthquake of 6.7 (Petersen et al., 1996).

Newport-Inglewood Fault: The onshore southeast-trending Newport-Inglewood fault zone (NIFZ) is discontinuous at the surface, consisting of a series of primarily left-stepping *en echelon* fault strands, each up to 6.5 km (4 miles) long that extend from near Beverly Hills south to Newport Beach, a distance of approximately 65 km (41 miles). At Newport Beach, the fault continues offshore where it lines up with the deeply incised Newport Submarine Canyon and is comprised of five strands and three step overs. To the south, back onshore, the fault continues as the Rose Canyon fault, extending in a southeasterly direction through San Diego and the international border to Baja California, where it continues as the Agua Blanca fault. Overall, from Beverly Hills to Baja California, the fault zone is more than 300 km (185 miles) long. At least five earthquakes of magnitude 4.9 or larger have been associated with the NIFZ since 1920 (Barrows, 1974). Estimated maximum deterministic magnitude earthquake is generally modeled between magnitude 6.5 and 7.5.

Hollywood Fault: Located approximately 6.6 miles (10.6 km) northwest of the site, the Hollywood Fault begins near the Los Angeles River and eastern edge of the Santa Monica Mountains and extends westward for approximately 9½ miles where it is thought to shift its locus of active deformation to the area near the West Beverly Hills Lineament (WBHL), where faulting takes a left step to the Santa Monica Fault. The Hollywood Fault is deemed capable of producing a magnitude 6.4 to 6.6 earthquake (Dolan et al., 1997). Investigators have estimated the lateral slip rate to be about 1.0 ±0.5 mm/year, with a vertical slip rate to be 0.25 mm/year (Dolan et al., 1997). Conversely, a lower slip rate of 0.04 - 0.4 mm/year (Ziony and Yerkes, 1985) leads to a long return period.

Recent detailed geologic and geotechnical studies have provided cumulative physical evidence for Holocene displacements resulting in an Alquist-Priolo Special Study Zone being established for the Hollywood Fault (CGS, 2014). Exposures identified in prior explorations (Crook and Proctor, 1992), coupled with bulk-soil radiocarbon ages provide scant evidence for an early to mid-Holocene age for the most recent surface rupture approximately 6,000 years to 11,000 years ago; suggesting a long period of quiescence between surface rupturing on the Hollywood Fault (Dolan, 1997, 2000) (Ziony and Yerkes, 1985).

Palos Verdes Fault: The main trace of the onshore Palos Verde Hills (PVH) fault is recognized as a general topographic escarpment along the northeast margin of Palos Verdes Hills, based on the presence of linear drainages, saddles, and tilted or uplifted surfaces (Fischer and others, 1987). The PVH fault is reportedly a high-angle southwest-dipping dextral oblique fault (with reverse component), which forms the southwestern boundary of the Los Angeles basin at the Palos Verdes uplift (Wright, 1991, McNeilan and others, 1996). The sense of movement is dominantly right-lateral as interpreted by Stephenson et.al. (1995). The ratio of horizontal to vertical offset is on the order of 7:1 to 8:1, as estimated by McNeilan and others (1996). Most of the PVH section may have a larger reverse component than the other sections due to the change in strike of the fault.

Little or no historic seismicity has been recorded on its onshore trend. The fault is thought to be capable of producing a magnitude 6.0 to 7.0 earthquake; however, the fault geometry most likely precludes fault rupture over its entire length of 80 kilometers (www.scec.org/fault_index/palos). The fault, penetrated by deep oil exploration wells in the seafloor offshore to the southeast, apparently cuts the seafloor and is thus considered active. Onshore, the character of the fault changes along with its strike direction due to compression. However, extensive deformation of the 120,000-year-old marine terrace on the peninsula, and the apparent Holocene folding of the Gaffey Street anticline, a feature related to drag movement along the Palos Verdes fault, are possible indications of the faults potential activity.

3.2 Historical Seismicity

An evaluation of historical seismicity from significant past earthquakes related to the site was performed (See Figure 5). Peak ground accelerations (PGAs) at the site resulting from significant past earthquakes between 1800 to 2018, with magnitudes 4.0 or greater, were estimated using the EQSEARCH computer program (Blake, 2000) with 2018 updates. This historical seismicity search was performed for a 100-mile (161-kilometer) radius from the project site, and is included in Appendix C, *Seismicity Data*. The largest earthquake magnitude found in the search was the magnitude 7.7 earthquake, known as the Arvin-Tehachapi quake that occurred on July 21, 1952, approximately 73 miles (117 kilometers) from the site producing an estimated PGA of approximately 0.05g at the site. The largest estimated PGA found in the search was approximately 0.23g from a magnitude 5.0 earthquake located approximately 2 miles (3.2 kilometers) away from the site.

Review of additional data publicly available from the Center for Engineering Strong Motion Data (CESMD) website (http://strongmotioncenter.org/) was reviewed for stations near the project site. The data reviewed indicates that a site (CGS Station 24048) located near the corner of 19th Street and Wilshire, approximately 1 mile east of the project site, experienced a PGA of 0.159g from the March 17, 2014 magnitude 4.4 Encino Earthquake. Another station (CSMIP Station 24202-Providence St. Johns Hospital) located approximately 1.25 miles to the east of the project site experienced a PGA of 0.107g from the same March 17, 2014 Encino Earthquake. We are unaware of any reported damage to the Roosevelt school campus as a result of earthquakes occurring over the last century.

3.3 Liquefaction and Lateral Spreading

Liquefaction is the loss of soil strength due to a buildup of excess pore-water pressure during strong and long-duration ground shaking. Liquefaction is associated primarily with loose (low density), saturated, relatively uniform fine- to medium-grained, clean cohesionless soils. As shaking action of an earthquake progresses, soil granules are rearranged and the soil densifies within a short period. This rapid densification of soil results in a buildup of pore-water pressure. When the pore-water pressure approaches the total overburden pressure, soil shear strength reduces abruptly and temporarily behaves similar to a fluid. For liquefaction to occur there must be:

(1) loose, clean granular soils,

(2) shallow groundwater, **and**

(3) strong, long-duration ground shaking.

Review of the Topanga Quadrangle Seismic Hazard Zone Map (CGS, 1999), the Beverly Hills Quadrangle Seismic Hazard Zone Map (CGS, 1999), and the City of Santa Monica Geologic Hazards map (City of Santa Monica, 2014) indicates the site is not located within an area mapped as potentially susceptible to liquefaction (Figure 6, *Seismic Hazard Map*).

The site is underlain by medium stiff to hard clays interbedded with medium dense to dense sand, silty sand, and gravel; with groundwater interpreted at depth of 47 feet. Given these factors, the potential for liquefaction and lateral spreading to affect the site is considered low.

3.4 Seismically-Induced Settlement

Seismically-induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event.

Based on our analysis, the total seismically-induced settlement is expected to be on the order of ½ inch or less. Accordingly, seismically-induced differential settlement is expected to be on the order of ¼ inch over 30 feet.

3.5 Seismically-Induced Landslides

The proposed project site is not located in an area mapped as potentially susceptible to seismically-induced landslides (Figure 6, *Seismic Hazard Map*). No landslides are mapped or known to exist at the project site or vicinity. The site is relatively flat and is not located adjacent to a significant slope. The potential for seismically induced landslides to affect the site is low.

3.6 Flooding

As shown on Figure 7, *Flood Hazard Zone Map*, the site is located outside of areas recognized by the Federal Emergency Management Agency (FEMA) to within 0.2% annual flood potential (FEMA, 2008). Earthquake-induced flooding can be caused by failure of dams or other water-retaining structures as a result of an earthquake. As shown on Figure 8, *Dam inundation Map*, the site is located outside of a dam inundation area due to the absence of such structures near the site, therefore the potential for earthquake-induced flooding at the site is considered low.

3.7 Seiches and Tsunamis

Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are sea waves generated by large-scale disturbance of the ocean floor that induces a rapid displacement of the water column above. The most frequent causes of tsunamis are shallow underwater earthquakes and submarine landslides.

The site is not located within the tsunami run up area as mapped on the Los Angeles Tsunami Hazard: Maximum Run-up map (CalEMA, 2010). The run up area indicates zones along the Pacific Coast below an elevation of 42 feet (msl) are susceptible to tsunami inundation. The project site is topographically at least 120 feet above the areas identified to have a potential for tsunamis impact. In addition, the site is not located within a tsunami inundation area as mapped by the State of California (CGS, 2009).

Based on the site's elevation of approximately 175 feet above sea level and the lack of nearby enclosed water bodies, the risks associated with tsunamis and seiches are considered negligible.

4.0 FINDINGS AND CONCLUSIONS

Presented below is a summary of findings and conclusions based upon the results of our evaluation of the project site:

- This site is **not** located within a currently designated Alquist-Priolo Special Studies Zone (CGS, 2018) for surface fault rupture.
- The site is **not** within a designated liquefaction hazard zone. The site is not located in any geologic or seismic hazard zone that could preclude the development of the proposed project. As is the case for most of Southern California, strong ground shaking has and will occur at this site.
- The site is underlain by undocumented artificial fill to depths ranging from approximately 2 to 5 feet bgs overlying native Pleistocene alluvial fan deposits generally consisting of medium stiff to hard clays interbedded with medium dense to dense sands; with varying proportions of predominantly slate gravels.
- Groundwater was encountered at a depth of 47 feet during the current exploration. Groundwater is not expected to pose a constraint to construction. The historic high groundwater level at the site was reported to be on the order of 40 to 50 feet bgs.
- The potential for liquefaction and liquefaction-induced ground failure to occur at the site is considered low.
- The potential seismically-induced settlement at the site is estimated to be on the order of ½ inch or less.
- Based on our observations and testing, the onsite soils that will be in contact with the planned structures are expected to have a very low expansion potential. However, given the variability of clayey soils at the site, testing is recommended during design stage or at completion of grading.
- Concrete in contact with the onsite soil is expected to have moderate exposure to water-soluble sulfates and low exposure to chloride in the soil. The onsite soil is considered moderately corrosive to ferrous metal.
- The subsurface materials are anticipated to be readily excavated using conventional earthmoving equipment in good working condition.
- The proposed improvements may be supported on conventional spread footings established on engineered fill or undisturbed natural soils.

Based on the results of this study, it is our opinion that the subject site is suitable for the proposed project from a geotechnical viewpoint. Geotechnical recommendations for the proposed development are presented in the following sections and are intended to provide sufficient geotechnical information to develop the project plans in accordance with the 2022 edition of the California Building Code (CBC) requirements.

5.0 RECOMMENDATIONS

The following recommendations have been developed based on the exhibited engineering properties of the onsite soils and their anticipated behavior during and after construction. Recommendations are specifically provided for design of foundations, seismic design considerations, floor slabs, retaining structures, paving, and grading. The proposed structure may be supported on spread-type shallow footing foundation systems established on engineered fill or undisturbed natural soils. Leighton should review the grading plan, foundation plans, shoring plans and specifications when they are available to verify that the recommendations presented in this report have been properly interpreted and incorporated.

Loading and bearing pressure diagrams should be provided for our review once prepared to confirm recommendations and settlement estimates remain valid for the project as currently proposed.

5.1 Grading

Project earthwork is expected to include complete demolition/removal of existing surface pavements, landscaping, utilities and complete overexcavation and recompaction of any remaining undocumented fill soils below new improvement footprints as described in the following subsections.

5.1.1 Site Preparation

After the site is cleared, the soils should be carefully observed for the removal of all unsuitable deposits. We recommend that after removal of pavements, hardscape, and existing utilities, all undocumented fill soils should be removed and recompacted within the proposed improvement footprint. Undocumented fill was generally encountered to a depths ranging from 2 to 5 feet. Deeper fill may be encountered between boring locations, particularly beneath existing structures.

This overexcavation bottom should extend horizontally either the thickness of fill below spread footings or at least 5 feet horizontally beyond the outside edges of proposed footings, whichever is deeper, space permitted. Overexcavation is not required for footings established directly on undisturbed natural soils. Any underground obstructions encountered should be removed. Utility lines should be removed or rerouted where interfering with proposed construction. *It is essential that excavation not* *undermine foundations of the existing buildings and structures that will remain in place along the boundaries project. As-Built details of any structure to remain should be provided to Leighton and the structural engineer prior to incorporation into the new design.*

Areas outside the classroom footprint limits, planned for new asphalt and/or concrete pavement, should be over-excavated to a minimum depth of 24 inches below existing or finish grade, or 18 inches below proposed pavement sections; whichever is deeper.

Resulting removal excavation bottom-surfaces should be observed by Leighton prior to placement of any backfill or new construction. After these over-excavations are completed, and prior to fill placement, exposed surfaces should be scarified to a minimum depth of 8 inches, moisture-conditioned to 2 percent above optimum moisture content, and recompacted (proof rolled) to a minimum 90 percent relative compaction as determined by ASTM D 1557 (modified Proctor compaction curve).

5.1.2 Earthwork Observation and Testing

Leighton Consulting, Inc. should observe and test all grading and earthwork, to check that the site is properly prepared, the selected fill materials are satisfactory, and that placement and compaction of fills has been performed in accordance with our recommendations and the project specifications. Sufficient notification to us prior to earthwork is essential. Project plans and specifications should incorporate recommendations contained in the text of this report.

Variations in site conditions are possible and may be encountered during construction. To confirm correlation between soil data obtained during our field and laboratory testing and actual subsurface conditions encountered during construction, and to observe conformance with approved plans and specifications, it is essential that we be retained to perform continuous or intermittent review during earthwork, excavation and foundation construction phases. Therefore, conclusions and recommendations presented in this report are contingent upon us performing construction observation services.

5.1.3 Fill Placement and Compaction

Onsite soils free of organics, debris and oversized material (greater-than 6 inches in largest dimension) are suitable for use as compacted structural fill. However, any soil to be placed as fill, whether onsite or imported material, should be first viewed by Leighton and then tested if and as necessary, prior to approval for use as compacted fill. All structural fill must be free of hazardous materials.

All fill soil should be placed in thin, loose lifts, moisture-conditioned, as necessary, to 2 percent above optimum moisture content and compacted to a minimum 90% relative compaction as determined by ASTM D 1557 standard test method (modified Proctor compaction curve) within building footprints. Aggregate base for pavement sections should be compacted to a minimum of 95% relative compaction. At least the upper 12 inches of the exposed soils in roadways and access drives, parking lots and (concrete –paver) flatwork areas, should be compacted to at least 95 percent relative compaction based on ASTM Test Method D 1557.

Fill Materials: The onsite soils, less any deleterious material or organic matter, can be used in required fills. Cobbles larger than 6 inches in largest diameter should not be used in the fill. Any required import material should consist of relatively non-expansive soils with a very low Expansion Index (EI<20). All proposed import materials should be approved by the geotechnical engineer of record prior to being placed at the site.

Surface Drainage: Water should not be allowed to pond or accumulate anywhere except in detention basins. Pad drainage should be designed to collect and direct surface water away from structures to approved drainage facilities. Hardscape drains should be installed and drain to storm water disposal systems. Drainage patterns approved at the time of fine grading should be maintained throughout the life of proposed structures. Irrigation and/or percolation should not be allowed for at least 10 feet horizontally around buildings.

5.1.4 Reuse of Concrete and Asphalt in Fill

Pulverized demolition concrete free of rebar and other materials and demolished asphalt pavement can be pulverized to particles no-larger-than (≤) 3-inches and mixed with site soils for use in compacted fill. Blended pulverized concrete and asphalt should be mixed with at least 25% soils by weight. Such materials must be free of and segregated from any hazardous materials and/or organic material of any kind.

5.1.5 Temporary Excavations

All temporary excavations, including utility trenches, retaining wall excavations, and other excavations should be performed in accordance with project plans, specifications and all State of California Occupational Safety and Health Administration (CalOSHA) requirements.

No surcharge loads should be permitted within a horizontal distance equal to the height of cut or 5 feet, whichever is greater from the top of the slope, unless the cut is shored appropriately. Excavations that extend below an imaginary plane inclined at 45 degrees below the edge of any adjacent existing site foundations should be properly shored to maintain support of these structures.

Temporary excavations should be treated in accordance with CalOSHA excavation regulations. The sides of excavations should be shored or sloped accordingly. CalOSHA allows the sides of unbraced excavations, up to a maximum height of 20 feet, to be cut to a ¾:1 (horizontal:vertical) slope for Type A soils, 1:1 for Type B soils, and 1½:1 for Type C soils.

The onsite soils within the proposed structural depths generally conform to CalOSHA Type C soils. CalOSHA regulations are applicable in areas with no restriction of surrounding ground deformations. Shoring should be designed for areas with deformation restrictions. The soil type should be verified or revised based on geotechnical observation and testing during construction, as soil classifications may vary over short horizontal distances. Heavy construction loads, such as those resulting from stockpiles and heavy machinery, should be kept a minimum distance equivalent to the excavation height or 5 feet, whichever is greater, from the excavation unless the excavation is shored and these surcharges are considered in the design of the shoring system.

5.1.6 Trench Backfill

Pipeline trenches should be backfilled with compacted fill in accordance with this report, and applicable *Standard Specifications for Public Works Construction* (Greenbook), current edition standards. Backfill in and above the pipe zone should be as follows:

- ***Pipe Zone****:* Any proposed pipe should be placed on properly placed bedding materials. Pipe bedding should extend to a depth in accordance to the pipe manufacturer's specification. The pipe bedding should extend to least 1 foot over the top of the conduit. The bedding material may consist of compacted free-draining sand, gravel, or crushed rock. If sand is used, the sand should have a sand equivalent greater than 30. As an alternate, the pipe bedding zone can be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, conforming to Section 201-6 of the 2021 Edition of the Standard Specifications for Public Works Construction (Greenbook). CLSM bedding should be placed to 1 foot over the top of the conduit, and vibrated. CLSM should not be jetted.

  Where granular backfill is used in utility trenches adjacent moisture sensitive subgrades and foundation soils, we recommend that a cut-off "plug" of impermeable material be placed in these trenches at the perimeter of buildings, and at pavement edges adjacent to irrigated landscaped areas. A "plug" can consist of a 5-foot long section of clayey soils with more than 35-percent passing the No. 200 sieve, or a Controlled Low Strength Material (CLSM) consisting of one sack of Portland-cement plus one sack of bentonite per cubic-yard of sand. CLSM should generally conform to Section 201-6 of the "Greenbook". This is intended to reduce the likelihood of water permeating trenches from landscaped areas, then seeping along permeable trench backfill into the building and pavement subgrades, resulting in wetting of moisture sensitive subgrade earth materials under buildings and pavements.

- ***Over Pipe Zone****:* Above the pipe zone, trenches can be backfilled with excavated on-site soils free of debris, organic and oversized material larger than 3 inches in largest dimension. As an option, the whole trench can be backfilled with one-sack CLSM same as presented above for the pipe bedding zone. Native soil backfill over the pipe-bedding zone should be placed in thin lifts, moisture conditioned, as necessary, and mechanically compacted using a minimum standard of 90% relative compaction relative to the ASTM D 1557 laboratory maximum dry density within building footprints. The upper 12-inches under hardscape, parking, paver etc. should be compacted to 95% relative compaction. Backfill above the pipe zone should **not** be jetted. In any case, backfill above the pipe zone (bedding) should be observed and tested by Leighton.

5.1.7 Corrosion Protection Measures

Water-soluble sulfates in soil can react adversely with concrete. As referenced in the 2022 California Building Code (CBC), Section 1904A, concrete subject to exposure to sulfates shall comply with requirements set forth in ACI 318. Based on laboratory testing results of the onsite soils from subsurface explorations, concrete structures in contact with the onsite soil will likely have **"moderate"** exposure to water-soluble sulfates in the soil. Therefore, common Type II Portland cement may be used for concrete construction in contact with site soils. Subgrade soil should be tested for water-soluble sulfate content prior to final design of the concrete structures once grading is complete. Import fill soil should be geotechnically tested for corrosivity and sulfate attack before import to the site. Further testing of import soils should include analytical testing for chemicals of concern prior to import and acceptance.

Based on corrosivity test results, the onsite soil is considered moderately corrosive to ferrous metals. Therefore, based on these results, ferrous pipe buried in moist to wet site earth materials should be avoided by using high-density polyethylene (HDPE), polyvinyl chloride (PVC) and/or other non-ferrous pipe when possible. Ferrous pipe can also be protected by polyethylene bags, tap or coatings, di-electric fittings or other means to separate the pipe from on-site soils.

5.2 Foundations

The proposed new structures may be supported on a shallow spread footing foundation system established on engineered fill or undisturbed natural soils.

5.2.1 Shallow Spread Footings

Footings for proposed structures should have a minimum embedment of 3 feet and have a minimum width of 18 inches. Footings for proposed temporary structures may be supported directly on grade.

Bearing Value: Footings or post-tensioned concrete slabs with thickened edges established on engineered fill or undisturbed natural soils may be designed to impose an allowable bearing pressure of 3,000 pounds per square foot (psf).

The excavations should be deepened as necessary to extend into satisfactory soils.

The ultimate bearing capacity can be taken as 9,000 psf. This value does not incorporate a factor of safety and may only be used for an ultimate bearing capacity check with appropriate factored loads.

The recommended bearing value is a net value, and the weight of concrete in the footings can be taken as 50 pounds per cubic foot (pcf); the weight of soil backfill can be neglected when determining the downward loads.

Settlement: The above recommended allowable bearing capacities are generally based on a total post-construction settlement of about ½ inch for column loads not exceeding 300 kips.

Differential settlement due to static loading is generally estimated at ¼ inch over a horizontal distance of 40 feet. Once developed by the structural engineer, we should review total dead and sustained live loads for each column including plan location and span distance, to evaluate if differential settlements between dissimilarly loaded columns will be tolerable. Excessive differential settlement can be mitigated with the use of reduced bearing pressures, deeper footing embedment, possibly changing overexcavation schemes and using imported base material under spread footings, or possibly other methods.

Lateral Resistance: Soil resistance available to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the foundation and the subgrade soil may be computed using a coefficient of friction of 0.35. The passive resistance may be computed using an equivalent fluid pressure of 250 pounds-per-cubic-foot (pcf), assuming there is constant contact between the footing and undisturbed soil. The passive resistance can be increased by one-third when considering short-duration wind or seismic loads. The friction resistance and the passive resistance of the soils can be combined without reduction in determining the total lateral resistance.

Uplift Resistance: To evaluate uplift resistance provided by the dead weight of soils above the footing, the frustum of soil above the footing may be estimated by a 30-degree outward projection from vertical. A unit weight of 120 pcf may be used for the soil volume within the frustum.

To evaluate uplift resistance provided by the shear resistance soils above the footing, an allowable shear value of 75 psf may be used along vertical shear planes from the bottom of the footing to the ground surface along the perimeter the footings. A factor of safety of 3 was used to develop the allowable shear value.

5.2.2 Modulus of Subgrade Reaction

For foundations established in undisturbed natural soil or engineered fill, an initial unit modulus of subgrade reaction (k_1) value of 150 pounds per cubic inch (pci) may be used.

The k_1 value presented herein, which corresponds to a 1-foot-square footing, should be reduced as shown below to incorporate foundation size effects:

$$k = k_1 \left(\frac{B+1}{2B}\right)^2$$

where B is the square footing width.

Leighton should review the resulting foundation deformation contours developed by the structural engineer for conformance with geotechnical settlement estimates.

5.2.3 Flagpole-Type Foundations

Canopy structures, light poles, and fencing may be supported on flagpole-type foundations. Flagpole-type foundations may be designed to impose an allowable vertical bearing pressure of 3,000 psf and an allowable lateral bearing pressure of 600 psf per foot below grade. The allowable vertical and lateral bearing pressures may be increased by one-third for short-duration loading such as wind or seismic loading. The recommended bearing value is a net value, and the weight of concrete in the flagpole footings can be taken as 50 pounds per cubic foot.

5.3 Seismic Design Parameters

To accommodate effects of ground shaking produced by regional seismic events, seismic design can be performed by the project structural engineer in accordance with the 2022 CBC. The table below, *2019 CBC Mapped Seismic Parameters*, lists seismic design parameters based on the 2019 CBC, Section 1613A.3 (ASCE 7-16) methodology:

Table 4 - 2022 CBC Mapped Seismic Parameters

Categorization/Coefficients	Code-Based (1) (2)
Site Longitude (decimal degrees) West	-118.5006
Site Latitude (decimal degrees) North	34.0283
Site Class	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s *(g)*	1.943
Mapped Spectral Response Acceleration at 1s Period, S_1 *(g)*	0.694
Short Period Site Coefficient at 0.2s Period, F_a	1.0
Long Period Site Coefficient at 1s Period, F_v	1.7[1]
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} *(g)*	1.943
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} *(g)*	1.18[1]
Design Spectral Response Acceleration at 0.2s Period, S_{DS} *(g)*	1.295
Design Spectral Response Acceleration at 1s Period, S_{D1} *(g)*	0.787[1]
Design Peak Ground Acceleration, PGA_M *(g)*	0.913

[1] *See Section 11.4.8 of ASCE 7-16. A site-specific ground motion hazard analysis in accordance with Section 21.2 of ASCE 7-16 is required for this site. Per Supplement 3 to ASCE 7-16, a site-specific ground motion hazard analysis is not required where the value of the parameters S_{M1} and S_{D1} in the table are increased by 50%.*

5.4 Slabs-on-Grade

Concrete slabs-on-grade should be designed by the structural engineer in accordance with 2022 CBC requirements for soils with a very low expansion potential. More stringent requirements may be required by the structural engineer and/or architect; however, slabs-on-grade should have the following minimum recommended components:

- ***Subgrade:*** Slab-on-grade subgrade soil should be moisture conditioned to 2% over optimum moisture content, to a minimum depth of 18 inches within building footprints and compacted to 90% of the modified proctor (ASTM D 1557) laboratory maximum density prior to placing either a moisture barrier, steel and/or concrete. Onsite soil may be suitable for this use; however, additional expansion testing should be performed upon completion of grading to verify expansive properties of onsite soil.

- ***Moisture Barrier:*** A moisture barrier consisting of at least 15-mil-thick Stego-wrap vapor barriers (see: http://www.stegoindustries.com/products/stego_wrap_vapor_barrier.php), or equivalent, should then be placed below slabs where moisture-sensitive floor coverings or equipment will be placed.

- ***Reinforced Concrete**:* A conventionally reinforced concrete slab-on-grade with a thickness of at least 5 inches within the building footprint and 6-inches for exterior SOG be placed in pedestrian areas without heavy loads. Reinforcing steel should be designed by the structural engineer, but as a minimum should be No. 3 rebar placed at 18 inches on-center, each direction (perpendicularly), mid-depth in the slab. A modulus of subgrade reaction (k) as a linear spring constant, of 75 pounds-per-square-inch per inch deflection (pci) can be used for design of heavily loaded slabs-on-grade, assuming a linear response up to deflections on the order of ¾ inch.

  Minor cracking of concrete after curing due to expansion, drying and shrinkage is normal and will occur. However, cracking is often aggravated by a high water-to-cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking.

5.4.1 Utilities and Trenches

Open or backfilled trenches paralleling any new or existing footings to remain shall not be below a 1:1 projection from outer lowest edge of footings or slab on grade. Where pipes cross under footings the footings shall be specifically designed by the engineer in charge. Pipe sleeves shall be provided where pipes cross through footings or footing walls and sleeve clearances shall be designed to account for potential settlement of not less than 1 inch around the pipe. Alternate and approved clearances can be provided by the design professional in charge of the utility.

5.5 Lateral Earth Pressures

Recommended lateral earth pressures are provided as equivalent fluid unit weights, in psf/ft. or pcf. These values do not contain an appreciable factor of safety, so the structural engineer should apply the applicable factors of safety and/or load factors during design.

On-site soils may be suitable to be used as retaining wall backfill due to its low expansion potential (Appendix B), however, field and laboratory verification are recommended before use. Site soils can be variable in composition and expansive characteristics, See Section 2.4. Should site soil be desired for reuse behind retaining walls the material should be tested to ensure Expansion potential is less than 20 (EI<20).

Recommended lateral earth pressures for retaining walls backfilled with sandy soils with drained conditions as shown on Figure 9 are as follows:

Table 5 - Retaining Wall Design Earth Pressures

Retaining Wall Condition (Level Backfill)	Equivalent Fluid Pressure (pounds-per-cubic-foot)*
Active (cantilever)	40
At-Rest (braced)	60
Passive Resistance (compacted fill)	250
Seismic Increment (add to active pressure)	30

*Only for level and drained properly compacted backfill

Walls that are free to rotate or deflect may be designed using active earth pressure. For walls that are fixed against rotation, the at-rest pressure should be used. For seismic condition, the pressure should be distributed as an inverted triangular distribution and the dynamic thrust should be applied at a height of 0.6H above the base of the wall.

Retaining Wall Surcharges: In addition to the above lateral forces due to retained earth, surcharge due to above grade loads on the wall backfill, such as existing building foundations, should be considered in design of retaining walls.

Vertical surcharge loads behind a retaining wall on or in backfill within a 1:1 (horizontal:vertical) plane projection up and out from the retaining wall toe, should be considered as lateral and vertical surcharge. Unrestrained (cantilever) retaining walls should be designed to resist one-third of these surcharge loads applied as a uniform horizontal pressure on the wall. Braced walls should also be designed to resist an additional uniform horizontal-pressure equivalent to one-half of uniform vertical surcharge loads. Consideration should be given to underpinning existing structures to remain in this zone, to reduce surcharge loads on the wall and to reduce the potential for inducing damaging settlement within these existing buildings, due to soil movement within the wall influence zone.

In areas where autos and pickup trucks will drive, we suggest assuming a uniform vertical surcharge of 300 psf, which would result in active and at-rest horizontal surcharges of 100 psf and 150 psf, respectively. This should be doubled in areas of heavy construction traffic (such as concrete trucks, heavy equipment delivery-trucks, etc.). If crane outrigger loads or other point load sources are applied as wall surcharge, this will require additional analyses based on load source and location relative to the wall.

5.5.1 Sliding and Overturning

Total depth of retained earth for design of walls and for uplift resistance, should be measured as the vertical height of the stem below the ground surface at the wall face for stem design, or measured at the heel of the footing for overturning and sliding. A soil unit weight of 120 pcf may be assumed for calculating the actual weight of the soil over the wall footing, if drained, or 60 pcf if submerged, for properly compacted backfill.

5.5.2 Drainage

Adequate drainage may be provided by a subdrain system positioned behind the walls. Typically, this system consists of a 4-inch minimum diameter perforated pipe placed near the base of the wall (perforations placed downward). The pipe should be bedded and backfilled with pervious backfill material described in Section 300-3.5.2 of the Standard Specifications for Public Works Construction (Green Book), 2021 Edition. This pervious backfill should extend at least 2 feet out from the wall and to within 2 feet of the outside finished grade. This pervious backfill and pipe should be wrapped in filter fabric, such as Mirafi 140N or equivalent, placed as described in Section 300-8.1 of the most recent edition of the Standard Specifications for Public Works Construction (Green Book). The subdrain outlet should be connected to a free-draining outlet or sump.

Miradrain, Geotech Drainage Panels, or Enkadrain drainage geocomposites, or similar, may be used for wall drainage as an alternative to the Class 2 Permeable Material or drain rock backfill, particularly where horizontal space is limited adjacent to shoring (where walls are cast against shoring). These drainage panels should be connected to the perforated drainpipe at the base of the wall.

5.6 Pavement Design

To provide support for paving, the subgrade soils should be prepared as recommended in Section 5.1, Grading. Compaction of the subgrade, including trench backfills, to at least 90 to 95 percent as recommended relative compaction based on ASTM Test Method D 1557 and achieving a firm, hard and unyielding surface will be important for paving support. The upper 12-inches of pavement subgrade should be compacted to 95% relative compaction. The preparation of the paving area subgrade should be performed immediately prior to placement of the base course. Proper drainage of the paved areas should be provided since this will reduce moisture infiltration into the subgrade and increase the life of the paving.

5.6.1 Base Course

The base course for both asphalt concrete and Portland Cement Concrete paving should meet the specifications for Class 2 Aggregate Base as defined in Section 26 of the latest edition of the State of California, Department of Transportation, and Standard Specifications. Alternatively, the base course could meet the specifications for untreated base as defined in Section 200-2 of the latest edition of *Standard Specifications for Public Works Construction* (Greenbook). Crushed Miscellaneous Base (CMB) may be used for the base course provided the geotechnical consultant evaluates and tests it before delivery to the site.

5.6.2 Asphalt Concrete

The required asphalt paving and base thicknesses will depend on the expected wheel loads and volume of traffic (Traffic Index or TI). Assuming that the paving subgrade will consist of the onsite or comparable soils with an R-value of at least 25 (Appendix B) compacted to at least 90 percent relative compaction based on ASTM Test Method D 1557 below the upper 12 inches and 95% relative compaction in the upper 12 inches, the minimum recommended paving thicknesses are presented in the following table:

Area	Traffic Index	Asphalt Concrete (inches)	Base Course (inches)
Light Truck	5	4	4
Heavy Truck	6	4	7½
Main Drives	7	5	9

The asphalt paving sections were determined using the Caltrans design method. We can determine the recommended paving and base course thicknesses for other Traffic Indices if required. Careful inspection is recommended to verify that the recommended thicknesses or greater are achieved, and that proper construction procedures are followed.

5.6.3 Portland Cement Concrete Paving

PCC paving sections were determined in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for a range of Traffic Indices are presented in the table below. We have assumed that the PCC will have a compressive strength $(f_c^{'})$ of at least 4,000 pounds per square inch (psi).

Assuming that the paving subgrade will consist of the onsite or comparable soils with an R-value of at least 25 (Appendix B) compacted to at least 90 percent relative compaction based on ASTM Test Method D 1557 below the upper 12 inches and 95% relative compaction in the upper 12 inches, the minimum recommended paving thicknesses are presented in the following table:

Area	Traffic Index	Portland Cement Concrete (inches)	Base Course (inches)
Light Truck	5	5½	4
Heavy Truck	6	6½	4
Main Drives	7	7	4

The paving should be provided with expansion joints at regular intervals no more than 15 feet in each direction. Load transfer devices, such as dowels or keys, are recommended at joints in the paving to reduce possible offsets. The paving sections in the above table have been developed based on the strength of unreinforced concrete. Steel reinforcing may be added to the paving to reduce cracking and to prolong the life of the paving.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Excavations

Based on our field observations, caving of cohesionless strata and loose fill soils will likely be encountered in unshored excavations. To protect workers entering excavations, excavations should be performed in accordance with OSHA and Cal-OSHA requirements, and the current edition of the California Construction Safety Orders, see:

http://www.dir.ca.gov/title8/sb4a6.html

Contractors should be advised that fill soils should be considered Type C soils as defined in the California Construction Safety Orders. As indicated in Table B-1 of Article 6, Section 1541.1, Appendix B, of the California Construction Safety Orders, excavations less-than (<) 20 feet deep within Type C soils should be sloped back no steeper than 1½:1 (horizontal:vertical), where workers are to enter the excavation. This may be impractical near adjacent existing utilities and structures; so shoring may be required depending on trench depth and locations. Stiff undisturbed native clays will stand steeper.

During construction, soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and Leighton Consulting, Inc. should be maintained to facilitate construction while providing safe excavations.

Excavations must <u>not</u> undermine foundations for existing buildings. Excavations must not encroach within a 1:1 (horizontal:vertical) wedge extending down and out from existing shallow footings to remain. Shoring or underpinning of existing building foundations may be required depending upon final footprint and floor elevations.

6.2 Geotechnical Services During Construction

Our geotechnical recommendations are contingent upon Leighton Consulting, Inc., providing geotechnical observation and testing services during earthwork and foundation construction. There is a potential for encountering deeper undocumented fill, underground obstructions or otherwise unacceptable existing soils between or beyond our boring locations. We are unaware of any existing fill placement documentation for this site. Therefore, inconsistent existing fill materials may be encountered during construction, possibly requiring revised geotechnical recommendations.

Our geotechnical recommendations provided in this report are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical exploration, testing and/or analysis may be required should the location of the buildings change from its currently proposed footprint (Figure 2). Leighton Consulting, Inc. should review site grading, foundation, and shoring plans when available, to comment further on geotechnical aspects of this project and check to see general conformance of final project plans to recommendations presented in this report.

Leighton Consulting, Inc. should be retained to provide geotechnical observation and testing during excavation and all phases of earthwork. Our conclusions and recommendations should be reviewed and verified by us during construction and revised accordingly if geotechnical conditions encountered vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During all excavation,
- During compaction of all fill materials,
- After excavation of all footings and prior to placement of concrete,
- During utility trench backfilling and compaction,
- During pavement subgrade and base preparation, and/or
- If and when any unusual geotechnical conditions are encountered.

7.0 LIMITATIONS

Leighton's work was performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical consultants practicing in this or similar localities. No other warranty, express or implied, is made as to the conclusions and professional opinions included in this report. As in many projects, conditions revealed in excavations may be at variance with our current findings. If this occurs, the changed conditions must be evaluated by the geotechnical consultant and additional recommendations be obtained, as warranted.

The identification and testing of hazardous, toxic or contaminated materials were outside the scope of Leighton's work. Should such materials be encountered at any time, or their existence is suspected, all measures stipulated in local, county, state and federal regulations, as applicable, should be implemented.

This report is issued with the understanding that it is the responsibility of the owner or a duly authorized agent acting on behalf of the owner, to ensure that the information and recommendations contained herein are brought to the attention of the necessary design consultants for the project and incorporated into the plans; and that the necessary steps are taken to see that the contracts carry out such recommendations in the field.

The findings of this report are considered valid as of the present date. However, changes in the condition of a property can occur with the passage of time, whether due to natural processes or the work of man on the subject or adjacent properties. In addition, changes in standards of practice may occur from legislation or the broadening of knowledge. Accordingly, the findings of this report may at some future time be invalidated wholly or partially by changes outside Leighton's control.

The conclusions and recommendations in this report are based in part upon data that were obtained from a necessarily limited number of observations, site visits, excavations, samples and testes. Such information can be obtained only with respect to the specific locations explored, and therefore may not completely define all subsurface conditions throughout the site. The nature of many sites is that differing geotechnical and/or geological conditions can occur within small distances and under varying climatic conditions. Furthermore, changes in subsurface conditions can and do occur over time. Therefore, the findings, conclusions, and recommendations presented in this report should be considered preliminary if unanticipated conditions are encountered and additional explorations, testing and analyses may be necessary to develop alternative recommendations.

This report has been prepared for the express use of Santa Monica Malibu Unified School District and its design consultants, and only as related expressly to the assessment of the geotechnical constraints of developing the subject site and for construction purposes. This report may not be used by others or for other projects without the express written consent of Santa Monica - Malibu Unified School District and our firm.

If parties other than Leighton are engaged to provide construction geotechnical services, they must be notified that they will be required to assume complete responsibility for the geotechnical phase of the project by concurring with the findings and recommendations in this report or by providing alternative recommendations. Any persons using this report for bidding or construction purposes should perform such independent investigations as they deem necessary to satisfy themselves as to the surface and/or subsurface conditions to be encountered and the procedures to be used in the performance of work on the subject site.

8.0 REFERENCES

Abrahamson, N.A. Silva, W.J., and Kamai, R., 2014, Summary of the ASK14 Ground Motion Relation for Active Crustal Regions, Earthquake Spectra 30, pp. 1025-1055.

American Society of Civil Engineers (ASCE), 2013, Minimum Design Loads for Buildings and Other Structures, ASCE/SEI 7-10, Third Printing, Errata Incorporated through March 15.

Barrows, A.G., 1974, A Review of the Geology and Earthquake History of the Newport-Inglewood Structural Zone, Southern California: California Division of Mines and Geology Special Report 114, 115 p.

Boore, D.M., Stewart, J.P., Seyhan, E., and Atkinson, G.A., 2014, NGA-West2 Equations for Predicting PGA, PGV, and 5% Damped PSA for Shallow Crustal Earthquakes, Earthquake Spectra 30, pp. 1057-1085.

Brankman, Charles M. and Shaw, John H., 2009, Structural Geometry and Slip of the Palos Verdes Fault, Southern California: Implications for Earthquake Hazards: Bulletin of the Seismological Society of America, V. 99, No. 3, p. 1730-1745, June 2009.

Bryant, W.A., 1988, Recently Active Traces of the Newport-Inglewood Fault Zone, Los Angeles and Orange Counties, California: California Division of Mines and Geology Open-File Report 88-14, 15 p.

Bryant, W.A., and Hart, E.W., 2007, Fault Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps, California Geological Survey: Special Publication 42.

Butlers, J., 1997, Analysis of Energy Measurement Methods of Standard Penetration Test Driving Systems, Master Thesis Submitted at Utah State University in Logan.

California Building Standards Commission (CBSC), 2022 California Building Code (CBC), Based on 2021 International Building Code.

California Geological Survey (CGS; previously known as the California Division of Mines and Geology), 1986, State of California Special Study Zones, Beverly Hills Quadrangle, Revised Official Map, July 1, 1986.

_____, 1998, Seismic Hazard Zone Report for the Beverly Hills 7.5-Minute Quadrangle, Los Angeles County, California, Seismic Hazard Zone Report 023, 1998.

_____, 1999, State of California Official Seismic Hazard Zones Map, Beverly Hills Quadrangle, Released March 25, 1999 map scale 1: 24,000.

______, 2000, CD-ROM containing digital images of Official Maps of Alquist-Priolo Earthquake Fault Zones that affect the Southern Region, CDMG CD 2000-003 2000.

______, 2008, Special Publication 117a, Guidelines for Evaluating and Mitigating Seismic Hazards in California.

______, 2009, Tsunami Inundation Map for Emergency Planning, Beverly Hills Quadrangle, Los Angeles County, California, map scale 1:24,000.

______, 2019, Note 48, Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings, dated October 2013.

______, 2014, California Geological Survey Fault Evaluation Report FER 253, The Hollywood Fault in the Hollywood 7.5 Minute Quadrangles, dated February 14, 2014

______, 2017, California Geological Survey Fault Evaluation Report FER 259, The Hollywood, Santa Monica and Newport-Inglewood Faults in the Beverly Hills and Topanga 7.5 Minute Quadrangles, dated June 28, 2017

______, 2018, Earthquake Zones of Required Investigation Beverly Hills Quadrangle, Revised Official Map January 11, 2018

California Office of Emergency Services (CalEMA), posted 2010, Los Angeles Tsunami Hazard: Maximum Runup, posted July 7, 2010.

California State Water Resources Control Board (CSWRCB), GeoTracker, http://geotracker.waterboards.ca.gov/.

Campbell, K.W., and Bozorgnia, Y., 2014, NGA-West2 Ground Motion Model for the Average Horizontal Components of PGA, PGV, and 5% Damped Linear Acceleration Response Spectra, Earthquake Spectra 30, pp. 1087-1115.

Catchings, R.D., Gandhok, G., Goldman, M.R., and Okaya, D., 2001, Seismic Images and Fault Relations of the Santa Monica Thrust Fault, West Los Angeles, California: U.S. Geological Survey Open-File Report 01-111, 15 p.

Chiou, B.S.-J., and Youngs, R.R., 2014, Update of the Chiou and Youngs NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra, Earthquake Spectra 30, pp. 1117-1153.

City of Santa Monica, 1995, Safety Element of the General Plan, dated January 1995.

City of Santa Monica, 2014, City of Santa Monica Geologic Hazards Map, Information Systems Department, Geographic Information Systems, January 2014.

Cooke, Michele L. and Marshall, Scott T., 2006, Fault Slip Rates from Three-Dimensional Models of the Los Angeles metropolitan area, California; Geophysical Research Letters, Vol. 33, November 9, 2006.

Crook, R., Jr., and Proctor, R., 1992, *The Hollywood and Santa Monica Faults and the Southern Boundary of the Transverse Ranges Province*: in Pipkin B., and Proctor, R., Engineering Geology Practice in Southern California.

Davis, T.L., and Namsom, J.S., 1994, A Balanced Cross Section of the 1994 Northridge Earthquake, Southern California: Nature 372: 167-169.

Dibblee, Jr., T.W., 1991, Geologic Map of the Beverly Hills and South ½ Van Nuys Quadrangles, Los Angeles County, California, Dibblee Geological Foundation Map DF-31, Santa Barbara, California, map scale 1:24,000.

Dolan, J.F., Sieh, K, Rockwell, T.K., Guptill, P., and Miller, G., 1997, Active Tectonics, Paleoseismology, and Seismic Hazards of the Hollywood Fault, Northern Los Angeles Basin, California: Geological Society of America Bulletin, Volume 109, No. 12, pp. 1595-1616.

Dolan, J.F., Sieh, K., and Rockwell, T.K., 2000, Late Quaternary Activity and Seismic Potential of the Santa Monica Fault System, Los Angeles, California: Geological Society of America Bulletin, Volume 112, No. 10, pp. 1559-1581.

Dolan, J.F., Gath, E.M., Grant, L.B., Legg, M., Lindvall, S., Mueller, K., Oskin, M., Ponti, D.F., Rubin, C.M., Rockwell, T.K., Shaw, J.H., Treiman, J.A., Walls, C., and Yeats, R.S. (compiler), 2001, Active Faults in the Los Angeles Metropolitan Region: Report by the Southern California Earthquake Center Group C.

Federal Emergency Management Agency (FEMA), 2008, Flood Insurance Rate Map, Los Angeles County, California and Incorporated Areas, Map No. 06037C1567G, April 21, 2008.

Fischer, P. J., Mesa, Inc. R. H. Patterson, A. C. Darrow, J. H. Rudat, and G. Simila, 1987, The Palos Verdes Fault Zone: onshore to offshore, in Geology of the Palos Verdes Peninsula and San Pedro Bay; Society of Economic Paleontologists and Mineralogists and American Association of Petroleum Geologists, Los Angeles, California 91-134.

Freeman, S.T., Heath, E.G., Guptill, P.D., and Waggoneer, J.T., 1992, Seismic Hazard Assessment, Newport-Inglewood Fault Zone, *in* Pipkin, B.W. and Proctor, R.J. (editors), Engineering Geologic Practice in Southern California: Association of Engineering Geologists Special Publication No. 4, pp. 211-231.

Hill, R.L., et al, 1979 Location and Activity of the Santa Monica fault, Beverly Hills-Hollywood area, California, in Earthquake Hazards Associated with Faults in the

Greater Los Angeles Area, Los Angeles County Including Faults in the Santa Monica, Raymond, Verdugo-Eagle Rock and Benedict Canyon Fault Zones, CDMG OFR 79-16 LA, P. B1-B43.

Hoots, H.W., 1931, Geology of the Eastern Part of the Santa Monica Mountains, Los Angeles County, California: USGS Professional Paper No. 165-C: p83-134, map scale 1:24,000.

Ishihara, K. and Yoshimine, M., 1992, “Evaluation of Settlements in Sand Deposits Following Liquefaction during Earthquakes,” *Soils and Foundations*, Vol. 32, No. 1, pp. 173-188.

Jennings, C. W., 1994, Fault Activity Map of California and Adjacent Areas: California Department of Conservation Division of Mines and Geology, California Geologic Data Map Series, Map No. 6, 1:750,000 scale.

Lajoie, K.R., Kern, J.P., Wehmiller, J.F., Kennedy, G.L., Mathieson, S.A., Sarna-Wojcicki, A.M., Yerkes, R.F., McCrory, P.F., 1979. Quaternary marine shorelines and crustal deformation, San Diego to Santa Barbara, California. In: Abbott, P.L. (Ed.), Geological Excursions in the Southern California Area. Department of Geological Sciences, San Diego State University, San Diego, pp. 3e15.

Leighton and Associates, 1994, Technical Background Report to the Safety Element of the City of Santa Monica General Plan, Project No. 7910399.001, dated March 30, 1994.

MACTEC, 2004, Fault Rupture Hazard Evaluation, Existing Boys Gymnasium and Music Building, University High School, 11800 Texas Avenue, West Los Angeles, California, dated December 7, 2004.

McNeilan, T. W., Rockwell, T. K., and Resnick, G. S., 1996, Style and Rate of Holocene Slip, Palos Verdes Fault, Southern California; in Journal of Geophysical Research, v. 101, no. B4, p. 8317-8334.

Moody, J. D., and Hill, M.J., 1956, Wrench Fault Tectonics: Geological Society of America Bulletin, v. 67, pp. 1207-1246.

Petersen, M. D., Bryan, W. A., Cramer, C. H., Cao, Tianquing, Reichle, M. S., Frankel, A. D., Lienkaemper, J. J., McCrory, P. A., and Schwartz, D. P., 1996, Probabilistic seismic hazard assessment for the state of California: California Division of Mines and Geology Open-File Report 96-08, 33 p.

Petersen, Mark D., Frankel, Arthur D., Harmsen, Stephen C., Mueller, Charles S., Haller, Kathleen M., Wheeler, Russell L., Wesson, Robert L., Zeng, Yuehua, Boyd, Oliver S., Perkins, David M., Luco, Nicolas, Field, Edward H., Wills, Chris J., and Rukstales, Kenneth S., 2008, Documentation for the 2008 Update of the United

States National Seismic Hazard Maps: U.S. Geological Survey Open File Report 2008-1128, 61 p.

Poland, J.F. and Piper, A.M., and others, 1956, Ground Water Geology of the Coastal Zone, Long Beach and Santa Ana Area, California. Geological Survey Water Supply Paper 1109.

Pratt, T.L., Dolan, J.F., et al., Multiscale Seismic Imaging of Active fault Zones for Hazard Assessment: A Case Study of the Santa Monica Fault Zone, Los Angeles, California, Geophysics Vol. 63 No. 2, March-April 1998.

Shaw, John H., 2007, Final Technical Report, Subsurface Geometry and Segmentation of the Palos Verdes Fault and Their Implications for Earthquake Hazards in Southern California; U.S. Geological Survey National Earthquake Hazard Reduction Program, June 1, 2007.

Southern California Earthquake Center (SCEC), 1999, Recommended Procedures for Implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Liquefaction Hazards in California, dated March 1999.

Stephenson, W. J., T. K. Rockwell, J. K. Odum, K. M. Sedlock, and D. A. Okaya, 1995, Seismic Reflection and Geomorphic Characterization of the Onshore Palos Verdes Fault Zone, Los Angeles, California; in: Bulletin of the Seismological Society of America, Vol. 85, No. 3, pp. 943-950, dated June 1995

Terzaghi, K., Peck, R., and Mesri, G., 1996, Soil Mechanics in Engineering Practice, Third Edition, John Wiley & Sons, Inc., Publishers, New York, Chichester, Brisbane, Toronto, Singapore.

Treiman, J. A., Lundberg, M., and Bryant, W. A., 2017, Palos Verdes Fault Zone, Palos Verdes Hills Section.

Tsutsumi, H., Yeats, R.S., and Huftile, G.J., 2001, Late Cenozoic Tectonics of the Northern Los Angeles Fault System, California: Geological Society of America Bulletin, Volume 113, No. 4, pp. 454-468.

United States Geological Survey (USGS), 1991, Topographic Map, Topanga 7.5-Minute Quadrangle, dated 1991.

_____, 1999, Topographic Map, Topanga 7.5-Minute Quadrangle, dated 1999.

Wright, T.L., 1991, Structural Geology and Tectonic Evolution if the Los Angeles Basin, California, in Biddle, K.T. (editor), Active Margin Basins: American Association of Petroleum Geologists Memoir 52, pp. 35-134.

Yerkes, R.F.; McCulloch, T.H.; Schoellhamer, J.E.; Vedder, J.G, 1965, Geology of the Los Angeles Basin, California- An Introduction: U.S. Geological Survey Professional Paper 420-A pp. 57.

Yerkes, R.F., and Campbell, R.H., 2005, Preliminary Geologic Map of the Los Angeles 30' x 60' Quadrangle, Southern California, United States Geological Survey: Open-File Report 2005-1019, Version 1.0, Map Scale 1:100,000.

Ziony, J.I., and Yerkes, R.F., 1985, Evaluating Earthquake and Surface-Faulting Potential *in* Ziony, J.I. (editor), Evaluating Earthquake Hazards in the Los Angeles Region - An Earth-Science Perspective: U.S. Geological Survey Professional Paper 1360, pp. 43-91

Project: 11428.048	Eng/Geol: CCK/EMH
Scale: 1 " = 2,000 '	Date: October 2023

Reference: © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS ©

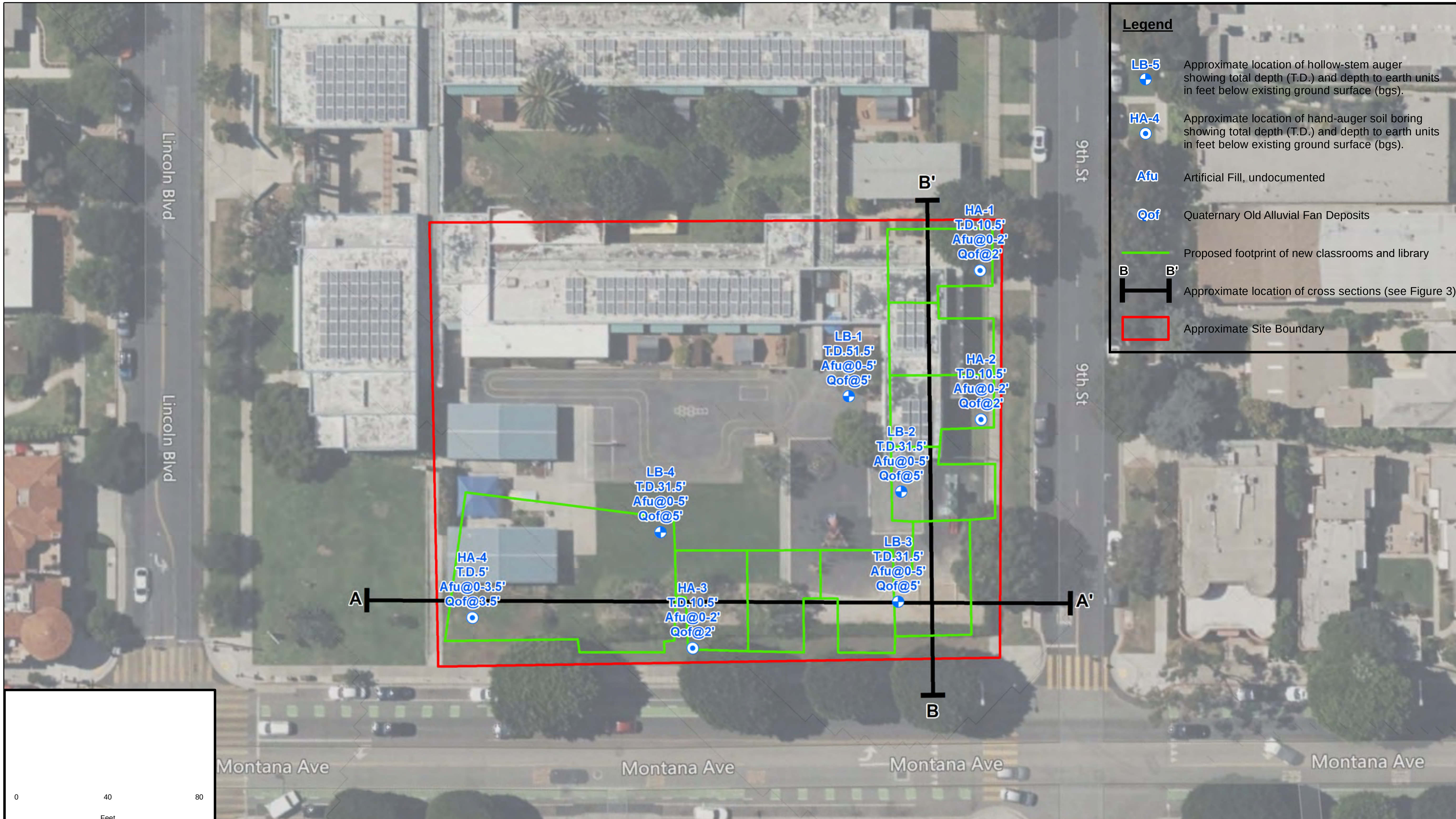
SITE LOCATION MAP

Roosevelt ES New TK-K Classroom Buildings and Library
801 Montana Avenue
Santa Monica, California

FIGURE 1

Leighton

Map Saved as V:\Drafting\11428\048\Maps\11428-048_F01_SLM_2023-10-02.mxd on 10/2/2023 2:57:23 PM Author: KVM (btran)



Project: 11428.048	Eng/Geol: CCK/EMH
Scale: 1 " = 40 '	Date: November 2023

Reference: © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS © 2023 TomTom

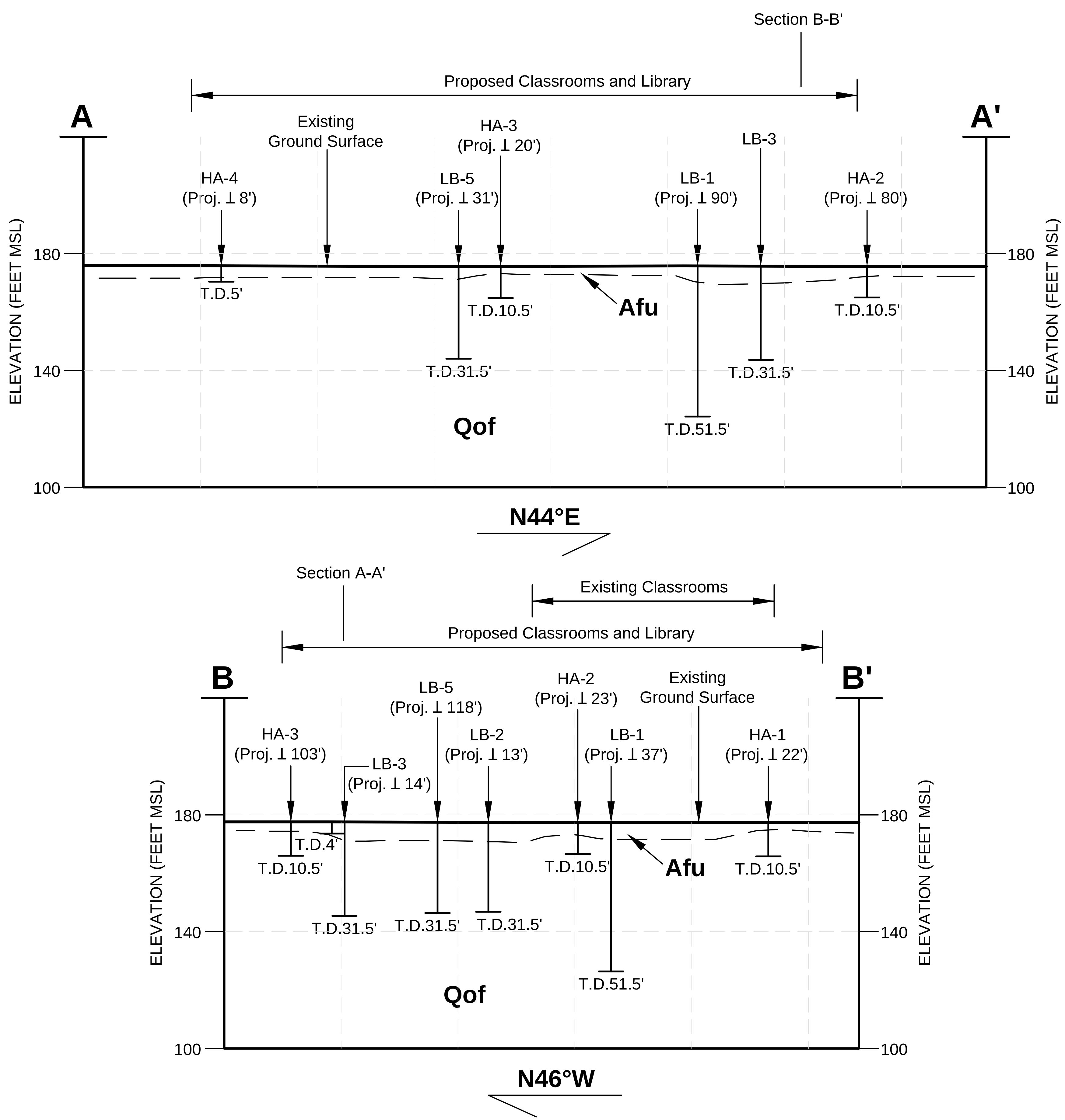
EXPLORATION LOCATION MAP

Roosevelt ES New TK-K Classroom Buildings and Library
801 Montana Avenue
Santa Monica, California

FIGURE 2

Leighton

Map Saved as V:\Drafting\11428\048\Maps\11428-048_F02_ELM_2023-11-16.mxd on 10/3/2023 4:14:46 PM(btran)



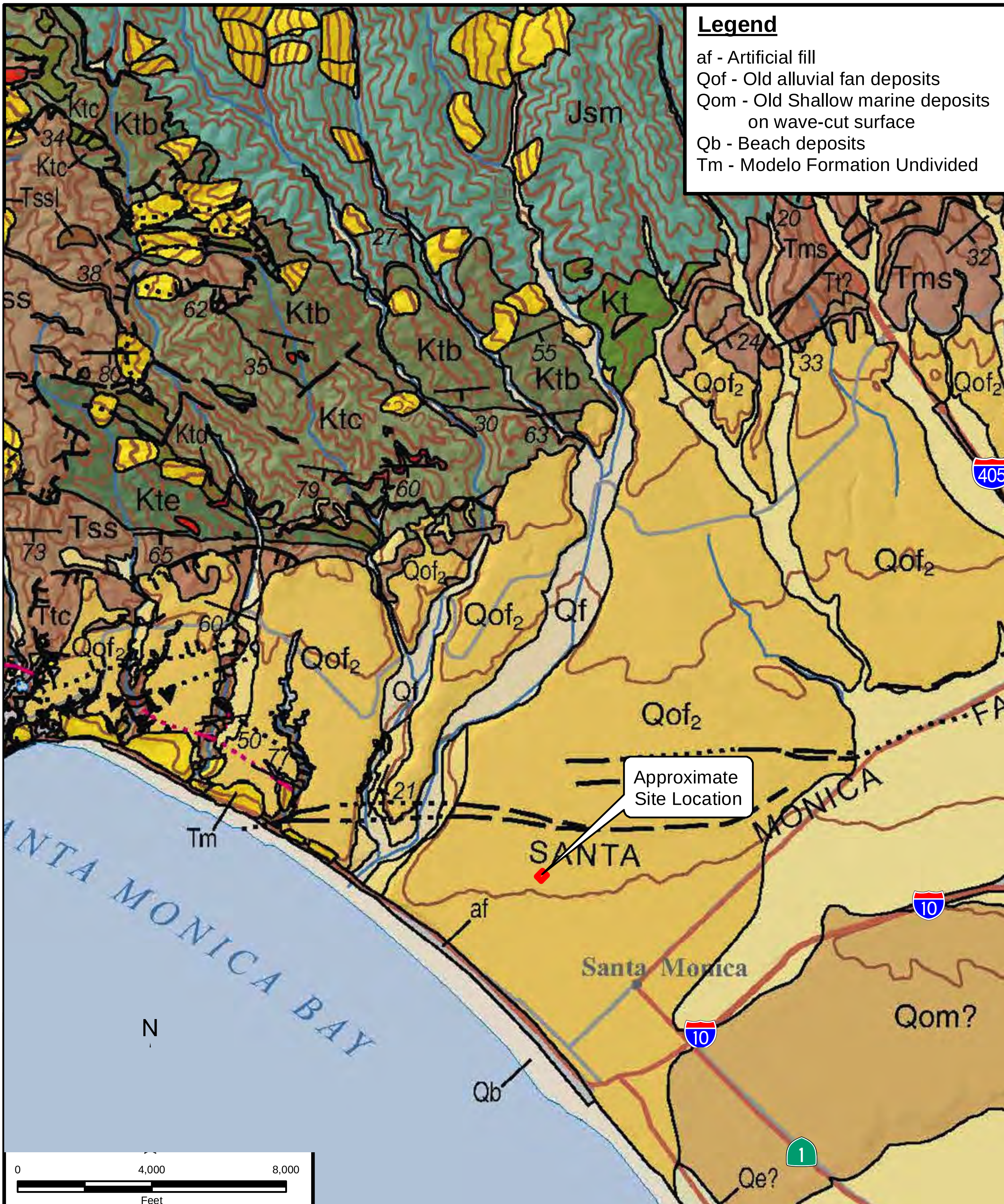
GEOTECHNICAL CROSS SECTIONS
A-A' AND B-B'

Roosevelt ES New TK-K Classroom Buildings and Library
801 Montana Avenue, Santa Monica, California

Leighton

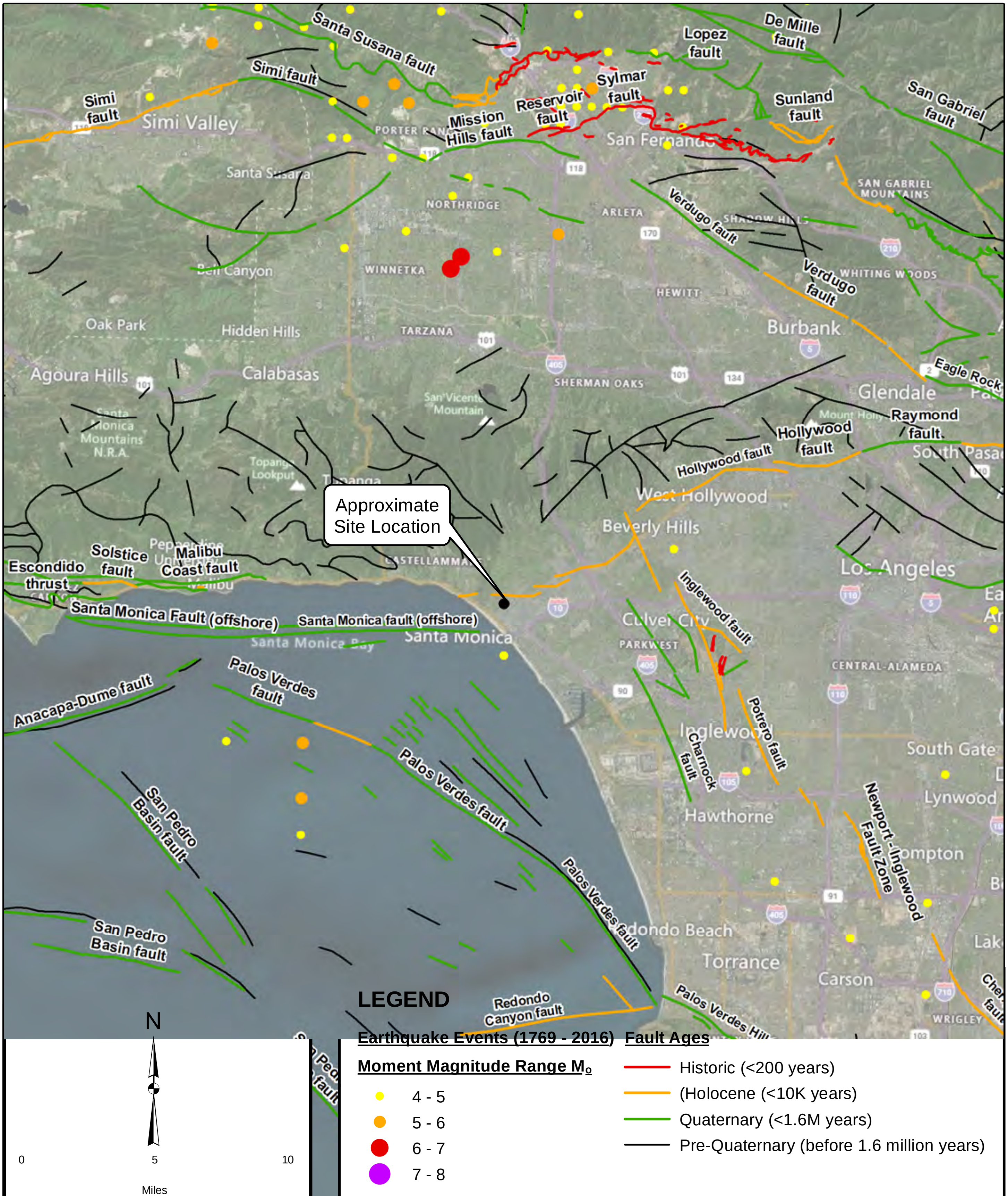
FIGURE 3	
Scale: 1"=40'	
Date: November 2023	
Proj: 11428.048	
Eng/Geol: CCK/EMH	

V:\DRAFTING\11428\048\CAD\2023-10-04\11428-048_F03_CS_2023-11-16.DWG (11-16-23 9:32:00AM) Plotted by: btran



Project: 11428.048	Eng/Geol: CCK/EMH	REGIONAL GEOLOGY MAP	FIGURE 4
Scale: 1 " = 4,000 '	Date: October 2023	Roosevelt ES New TK-K Classroom Buildings and Library 801 Montana Avenue Santa Monica, California	Leighton
Reference: Base Map: Preliminary Geologic Map of the Los Angeles Quandrangle, California, 2014			

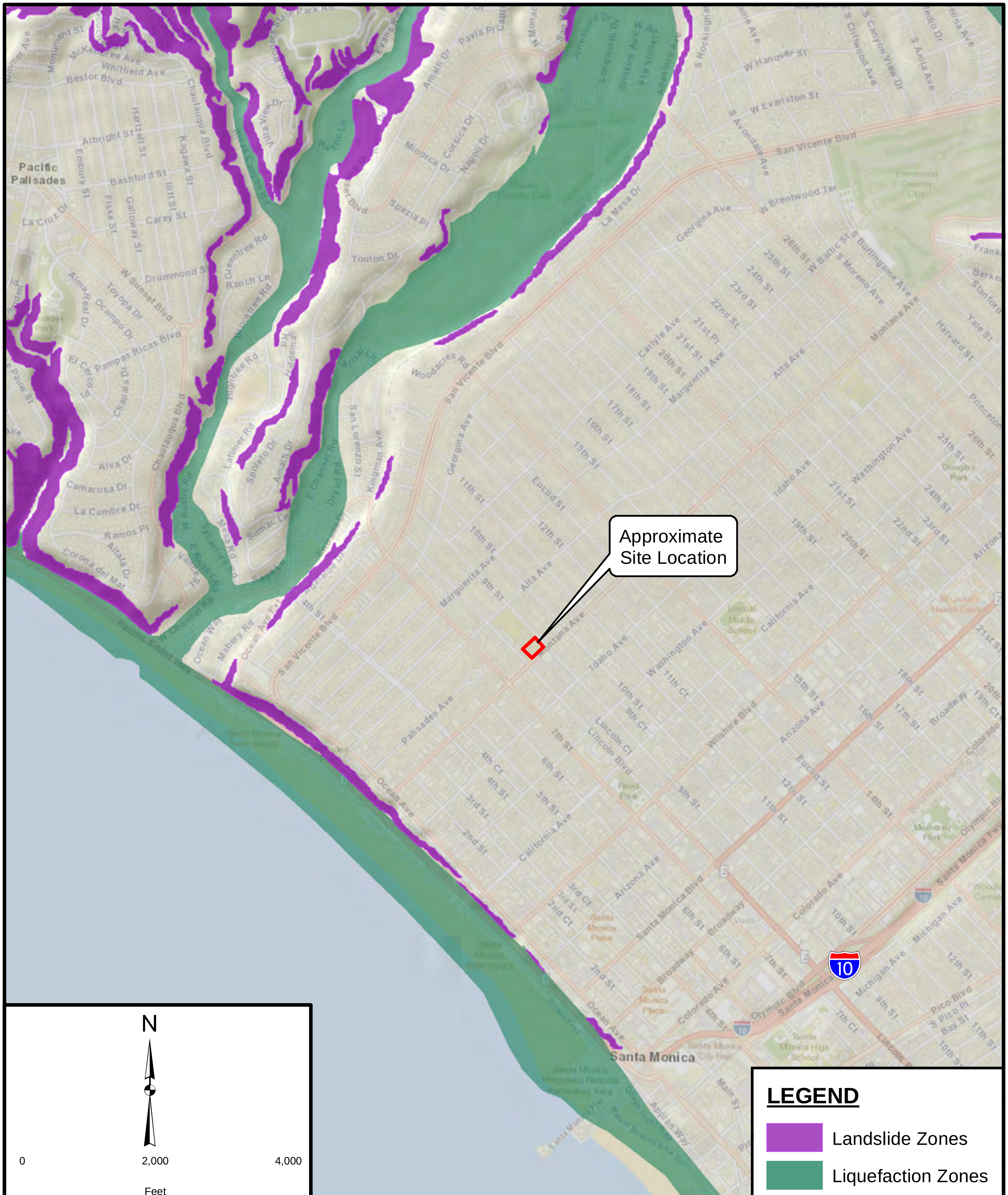
Map Saved as V:\Drafting\11428\048\Maps\11428-048_F04_RGM_2023-10-02.mxd on 10/2/2023 2:00:58 PM (btran)



Project: 11428.048	Eng/Geol: CCK/EMH	REGIONAL FAULT AND HISTORICAL SEISMICITY MAP	FIGURE 5
Scale: 1 " = 5 miles	Date: October 2023	Roosevelt ES New TK-K Classroom Buildings and Library 801 Montana Avenue Santa Monica, California	Leighton

Reference: ESRI ArcGIS Online 2023
Bryant, W. A. (compiler), 2005, Digital Database of Quaternary and Younger Faults from the Fault Activity Map of California, version 2.0: CGS, USGS, SCEC.
Author: Leighton Geomatics (btran)

Map Saved as V:\Drafting\11428\048\Maps\11428-048_F05_RF&HSM_2023-10-04.mxd on 10/4/2023 8:26:22 AM



Project: 11428.048	Eng/Geol: CCK/EMH
Scale: 1 " = 2,000 '	Date: October 2023

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

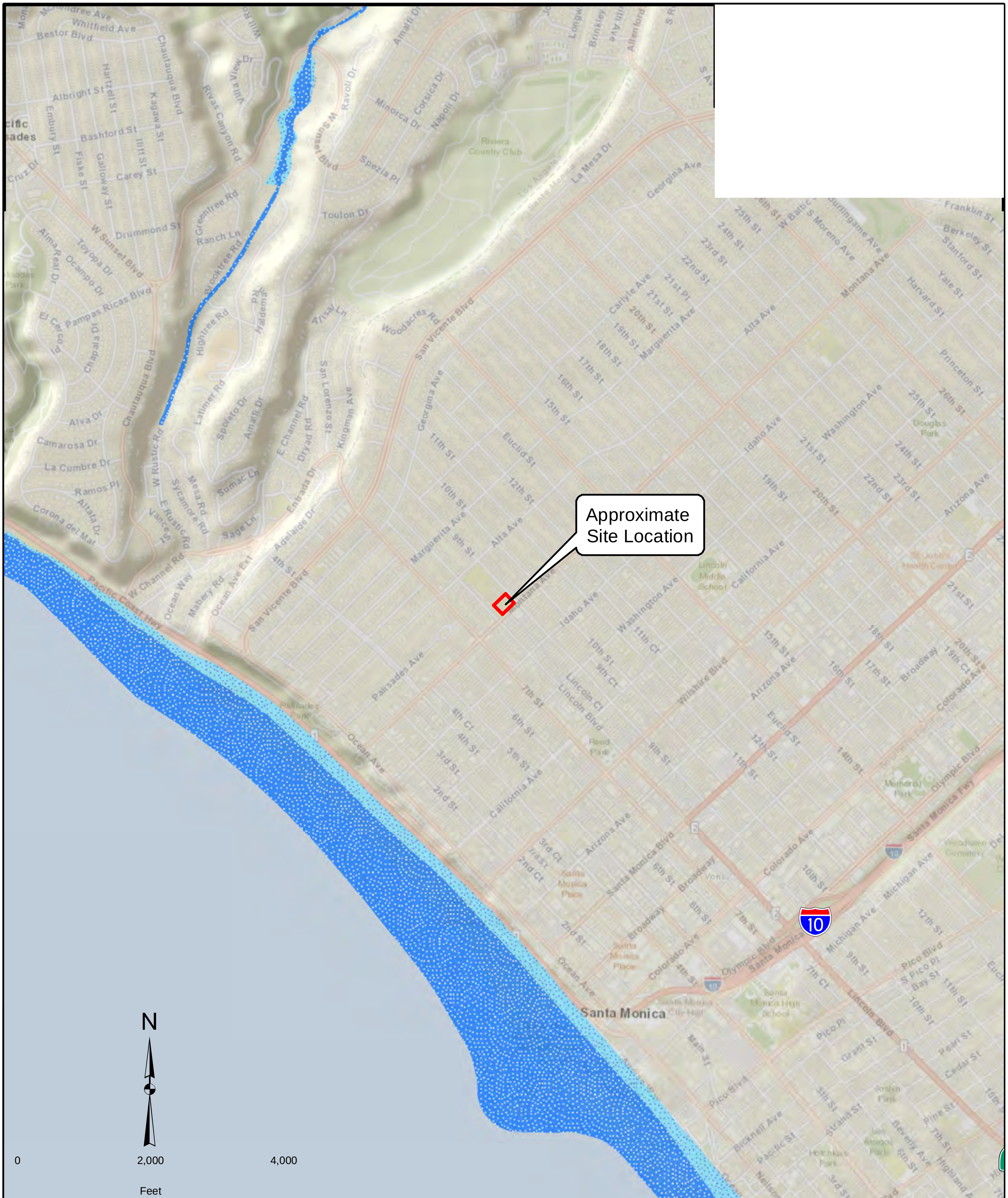
SEISMIC HAZARD MAP

Roosevelt ES New TK-K Classroom Buildings and Library
801 Montana Avenue
Santa Monica, California

FIGURE 6

Leighton

Map Saved as V:\Drafting\11428\048\Maps\11428-048_F06_SHM_2023-10-02.mxd on 10/2/2023 2:09:20 PM (btran)



Project: 11428.048	Eng/Geol: CCK/EMH
Scale: 1 " = 2,000 '	Date: October 2023

Reference: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
FEMA (http://www.fema.gov/index.shtm), DWR (http://www.dwr.ca.gov)

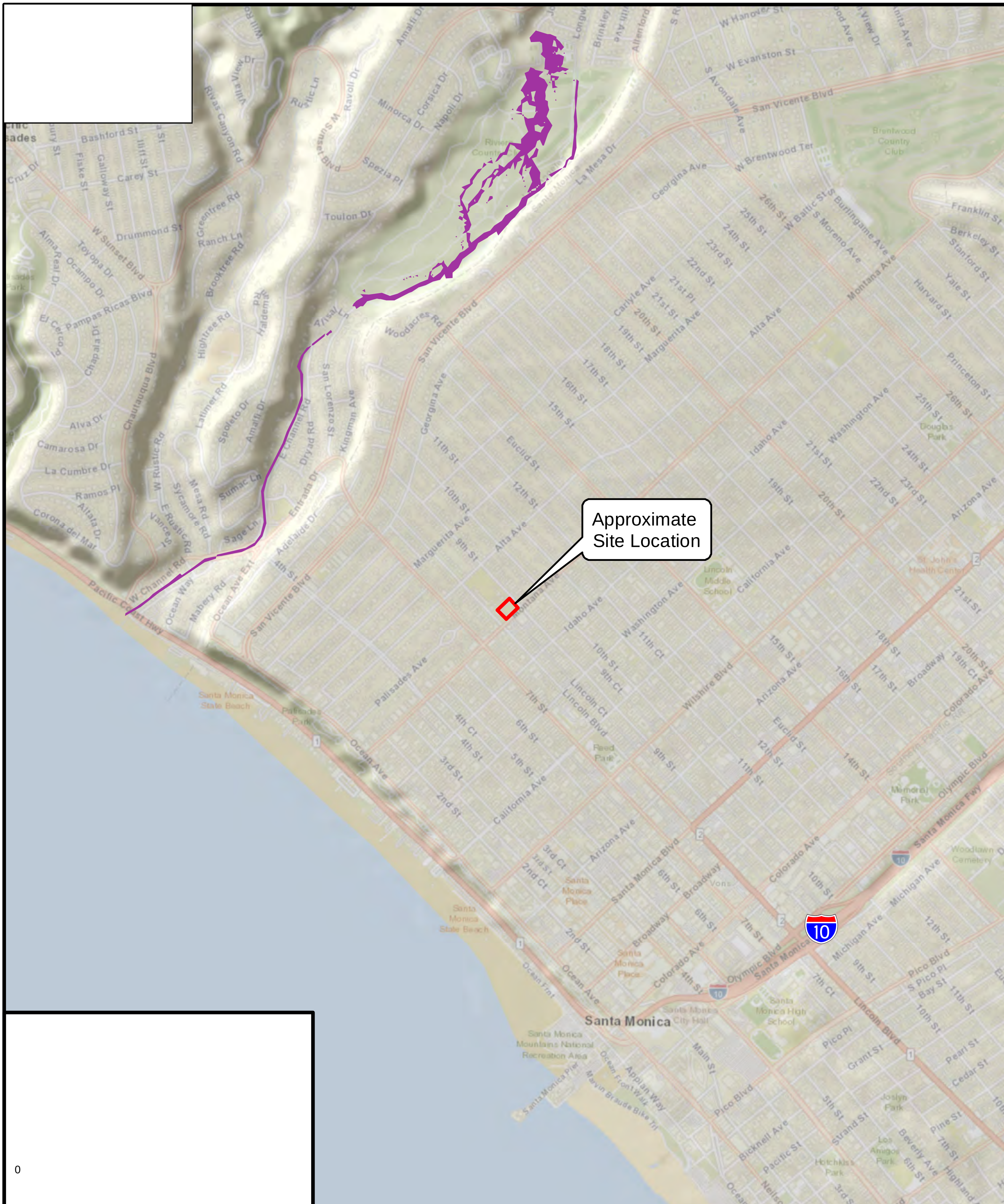
FLOOD HAZARD ZONE MAP

Roosevelt ES New TK-K Classroom Buildings and Library
801 Montana Avenue
Santa Monica, California

FIGURE 7

Leighton

Map Saved as V:\Drafting\11428\048\Maps\11428-048_F07_FHM_2023-10-02.mxd on 10/2/2023 2:27:52 PM Author: KVM (btran)



Project: 11428.048	Eng/Geol: CCK/EMH
Scale: 1 " = 2,000 '	Date: October 2023

Base Map: ESRI ArcGIS Online 2023
Reference: Office of Emergency Services (2007),
Dept of Safety of Dams (2021)
National Inventory of Dams, Army Corps of Engrs (2021)

DAM INUNDATION MAP

Roosevelt ES New TK-K Classroom Buildings and Library
801 Montana Avenue
Santa Monica, California

FIGURE 8

Leighton

Map Saved as V:\Drafting\11428\048\Maps\11428-048_F08_DIM_2023-10-02.mxd on 10/2/2023 2:56:33 PM (btran)

APPENDIX A

Field Exploration Logs

Leighton
a verdantas company

GEOTECHNICAL BORING LOG HA-1

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	MKD
Drilling Co.	Strong Arm Environmental	**Hole Diameter**	4"
Drilling Method	Hand Auger	**Ground Elevation**	171'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	MKD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1					CL-ML	**Artificial Fill, Undocumented (Afu):** @0': Silty CLAY, brown, moist, few rock fragments, rootlets, low to medium plasticity	
170											
										Quaternary Old Alluvial Fan Deposit (Qof): @2': Silty CLAY, brown, moist, few rock fragments, rootlets, low to medium plasticity	
	5			S-1				18		@5': Silty CLAY, brown, moist, few rock fragments, rootlets, low to medium plasticity	
165											
				R-1			110	18		@7': Silty CLAY, brown, moist, low plasticity, massive bedding, PP>4.50 tsf	
	10			S-2				17		@10': Silty CLAY, brown, moist, low plasticity, rootlets, few subangular to subrounded gravel	
160										**Total Depth: 10.5 feet** **No groundwater encountered during drilling.** **Backfilled with soil cuttings and bentonite chips.**	
	15										
155											
	20										
150											
	25										
145											
	30										

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG HA-2

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	MKD
Drilling Co.	Strong Arm Environmental	**Hole Diameter**	4"
Drilling Method	Hand Auger	**Ground Elevation**	173'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	MKD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1	Bulk				CL-ML	**Artificial Fill, Undocumented (Afu):** @0': Silty CLAY, brown, moist, rootlets, low to medium plasticity, slate gravel fragments, subangular to subrounded	
170										**Quaternary Old Alluvial Fan Deposit (Qof):** @2': Silty CLAY, brown, moist, rootlets, low to medium plasticity, slate gravel fragments, subangular to subrounded	
	5			S-1				18		@5': Silty CLAY, light brown, moist, low plasticity, rootlets, some dark grey gravel, trace fine sand	
165				R-1			110	17	CL	@7': Sandy CLAY, brown, brown, moist, low to medium plasticity, some silt, large slate fragments, fine to medium sand, subangular slate, rootlets, slight FeO oxidation, massive bedding, pockets of medium sand, PP>4.50 tsf	
	10			S-2				19		@10': Lean CLAY, brown, moist, rootlets, few slate modules, massive bedding	
160										**Total Depth: 10.5 feet** **No groundwater encountered during drilling.** **Backfilled with soil cuttings and bentonite chips.**	
	15										
155											
	20										
150											
	25										
145											
	30										

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG HA-3

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	MKD
Drilling Co.	Strong Arm Environmental	**Hole Diameter**	4"
Drilling Method	Hand Auger	**Ground Elevation**	174'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	MKD

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
174	0			B-1	Bulk				CL-ML	**Artificial Fill, Undocumented (Afu):** @0': Silty CLAY, brown, moist, some subangular gravel, few fine sand, dark grey slate fragments, low plasticity, few organics	
	2									**Quaternary Old Alluvial Fan Deposit (Qof):** @2': Silty CLAY, brown, moist, some subangular gravel, few fine sand, dark grey slate fragments, low plasticity, few organics	
170	5			R-1			102	20		@5': Silty CLAY, brown, moist, few rootlets, few fine sand, dark grey slate patches, PP>4.50/=4.50 tsf	
	7			S-1				20		@7': Silty CLAY, brown, moist, few rootlets, few fine sand, dark grey slate patches	
165	10			S-2				17	CL	@10': Lean CLAY, brown, moist, few dark grey subrounded gravel, low to medium plasticity, few fine sand, massive bedding	
160	15										
155	20										
150	25										
145	30										

Total Depth: 10.5 feet
No groundwater encountered during drilling.
Backfilled with soil cuttings and bentonite chips.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG HA-4

Project No.	11428.048	**Date Drilled**	9-30-23
Project	Roosevelt TK-K Classroom	**Logged By**	
Drilling Co.	Leighton Consulting, Inc.	**Hole Diameter**	"
Drilling Method	Hand Auger	**Ground Elevation**	173'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	EMH

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
										This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
	0									@Surface: Grass/ topsoil **Artificial Fill, Undocumented (Afu):** @1': Sandy CLAY with Gravel, brown, moist, fine to coarse sand, fine gravel	
170				S-1					CL	@2.5': Silty SAND with Gravel, brown, brown to reddish brown, moist, fine to coarse sand, fine subangular slate and granitic gravels.	
				S-2					SC	**Quaternary Old Alluvial Fan Deposit (Qof):** @3.5': Clayey SAND with Gravel, reddish brown, moist, fine to coarse sand, fine subangular slate fragements	
	5									**Total Depth: 5 feet** **No groundwater encountered during drilling.** **Backfilled with soil cuttings and bentonite chips.**	
165											
	10										
160											
	15										
155											
	20										
150											
	25										
145											
	30										

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-1

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	174'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0			BB-1	Bulk				SC	@Surface: 4 inches of asphalt concrete over subgrade **Artificial Fill, Undocumented (Afu):** @0.25': Clayey SAND, medium brown, slightly moist, fine to coarse grained sand, sparse fine gravel, subrounded	CN, CR, DS, EI MD, RV
170	5			R-1	Driven	7 16 21			CL	**Quaternary Old Alluvial Fan Deposit (Qof):** @5': Lean CLAY, very stiff, medium to dark brown, slightly moist, fine grained sand, low plasticity	CN, DS
				R-2	Driven	8 13 19	109	15		@7': Lean CLAY, stiff, medium to dark brown, slightly moist, low plasticity, PP>4.50 tsf	AL
165	10			R-3	Driven	4 15 24				@10': Lean CLAY, very stiff, medium to dark brown, slightly moist, low plasticity, sparse fine gravel, subrounded to subangular, rootlets	CN, DS
160	15			R-4	Driven	9 9 9	113	8	SM	@15': Silty SAND with Gravel, medium dense, medium to dark brown, slightly moist, fine grained sand, trace clays, subrounded to subangular gravel, rootlets, PP>4.50 tsf	
155	20			S-1	Driven	6 9 17		9		@20': Silty SAND with Gravel, medium dense, medium to dark brown, slightly moist, medium to fine grained sand,	
150	25			R-5	Driven	8 20 15	119	5		@25': Silty SAND with Gravel, medium dense, medium to dark brown, slightly moist, medium to fine grained sand, medium to fine gravel, subangular to subrounded gravel, larger fragments of slate visible within sample, increase in gravel	
145	30										

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-1

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	174'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30		S-2	15 21 9		5	SM	@30': Silty SAND with Gravel, medium dense to dense, medium to light brown, slightly moist, medium to fine grained sand, fine to medium subangular to subrounded gravel, fragments of slate	
140	35		R-6	5 9 3	123	13	CL	@35': Sandy CLAY, medium stiff, medium to dark brown, slightly moist to moist, fine grained sand, fine to medium gravel, subangular to subrounded gravel, low plasticity, PP=4.00/2.50 tsf	
135	40		S-3	5 8 8		12		@40': Lean CLAY with Gravel, very stiff, medium to dark brown, slightly moist to moist, fine to medium gravel, subangular to subrounded, low plasticity, sparse gravel within sample	
130	45		R-7	8 20 50	129	8	SM	@45': Silty SAND with Gravel, very dense, medium to dark brown, slightly moist, fine to medium grained sand, fine to medium gravel, subangular to subrounded, trace clay, increased gravel, PP>4.50 tsf	
125	50		S-4	18 22 25		6		@50': Silty SAND with Gravel, very dense, medium to dark brown, slightly moist, fine tro coarse grained sand, fine to medium gravel, subangular to subrounded gravel, wet soil cuttings	
120	55								
115	60								

Total Depth: 51.5 feet
Groundwater encountered at approximately 47 feet.
Backfilled with soil cuttings and patched with dyed concrete.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-2

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	173'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	Soil Description	Type of Tests
	0			BB-1	Bulk				CL-ML	@Surface: 4 inches of asphalt concrete over subgrade **<u>Artificial Fill, Undocumented (Afu):</u>** @0.25': Silty CLAY, dark brown, moist, fine to medium grained sand, fragments of slate, topsoil	
170										@3': Silty CLAY, dark brown, moist, fine to medium grained sand, fragments of slate, trace gravel, subangular to subrounded	
	5			R-1	Driven	9 19 26	110	18	CL	**<u>Quaternary Old Alluvial Fan Deposit (Qof):</u>** @5': Lean CLAY, very stiff, medium to dark brown, slightly moist, low plasticity, trash debris present, PP>4.50 tsf	AL
165				R-2	Driven	11 22 19	116	16		@7': Lean CLAY, very stiff, medium to dark brown, slightly moist, low plasticity, trace gravel, fine gravels, subrounded, PP>4.50 tsf	
	10			R-3	Driven	7 13 27	118	16	CL-ML	@10': Silty CLAY, very stiff, brown, slightly moist, low plasticity, transitions to sandy gravel, very stiff, fragments of slate, fine to medium sand, fine to medium gravel, PP>4.50 tsf	
160											
	15			S-1	Driven	3 4 4		17	CL	@15': Sandy CLAY, medium stiff, brown, slightly moist, fine to medium grianed sand, trace gravel, subangular to subrounded, fractured slate, low plasticity	
155											
	20			R-4	Driven	3 9 9	105	17	SM	@20': Silty SAND, medium dense, brown, moist, fine to medium grained sand, trace gravel, low plasticity clay, PP=3.25/>4.50 tsf	
150											
	25			S-2	Driven	14 22 23		5	GP	@25': Sandy GRAVEL, dense, grey to brown, slightly moist, fractured slate, subangular to subrounded gravel, fine to medium grained sand	
145											
	30										

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-2

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	173'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			R-5	Driven	4 8 9	105	13	SM	@30': Silty SAND, medium dense, brown, moist, trace clay, trace gravel, fine sand, subrounded gravel, PP=4.50/4.00 tsf	
140										**Total Depth: 31.5 feet** **No groundwater encountered during drilling.** **Backfilled with soil cuttings and patched with dyed concrete.**	
	35										
135											
	40										
130											
	45										
125											
	50										
120											
	55										
115											
	60										

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

*** * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * ***

GEOTECHNICAL BORING LOG LB-3

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	173'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

SOIL DESCRIPTION

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
173	0			BB-1	Bulk				SC-SM	@Surface: 2 inches of asphalt concrete over subgrade **Artificial Fill, Undocumented (Afu):** @0.16': Silty Clayey SAND, dark brown, moist, fine to medium grained, fragmaents of slate, topsoil	
170											
	5			R-1	Driven	7 16 22	111	18	CL-ML	**Quaternary Old Alluvial Fan Deposit (Qof):** @5': Silty CLAY, very stiff, medium to dark brown, moist, low plasticity, trace gravel, gravel layers interbedded, fine to medium gravel, subangular to subrounded, PP>4.50 tsf	
165				R-2	Driven	4 12 21	111	18		@7': Silty CLAY, very stiff, medium to dark brown, moist, low plasticity, trace gravel, gravel layers interbedded, fine gravel, subrounded, fragments of slate, rootlets, PP>4.50 tsf	
	10			R-3	Driven	6 10 11	119	13		@10': Silty CLAY with Gravel, stiff, medium to dark brown, moist, medium to fine gravel, subangular to subrounded, some pebbles, low plasticity, fragments of slate, PP>4.50 tsf	
160											
	15			R-4	Driven	15 14 19	126	8	ML	@15': Sandy SILT with Gravel, very stiff, medium to dark brown, slightly moist, medium to fine gravel, very fine grained sand, subangular to subrounded gravel, trace clay, fragments of slate, PP>4.50 tsf	
155											
	20			S-1	Driven	3 3 5		18	CL	@20': Sandy CLAY, medium stiff, medium to dark brown, slightly moist, fine grained sand, trace gravel, fine to medium gravel, subangular to subrounded, fragments of slate, low plasticity	
150											
	25			R-5	Driven	4 11 12	121	8	GP	@25': Sandy GRAVEL, medium dense, medium to dark brown, slightly moist, fine grained sand, fine to coarse gravel, subangular to subrounded, pebble sized/cobble sized, trace clay, fragments of slate, PP>4.50 tsf	
145											
	30										

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

Leighton

GEOTECHNICAL BORING LOG LB-3

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	173'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	30			S-2		2 2 5		22	SM	@30': Silty SAND, loose, medium to dark brown, slightly moist, fine to medium grained sand, trace clay, sparse gravel, subrounded gravel	
										Total Depth: 31.5 feet **No groundwater encountered during drilling.** **Backfilled with soil cuttings and patched with dyed concrete.**	
140											
	35										
135											
	40										
130											
	45										
125											
	50										
120											
	55										
115											
	60										

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

GEOTECHNICAL BORING LOG LB-4

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	172'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION *This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	Type of Tests
	0			BB-1				CL-ML	@Surface: Grass/ topsoil **Artificial Fill, Undocumented (Afu):** @0': Silty CLAY, dark brown, moist, fine to medium grained sand, fragmnets of slate	CN, CR, DS, EI MD, RV
170										
	5			R-1	3 5 8	109	21		**Quaternary Old Alluvial Fan Deposit (Qof):** @5': Silty CLAY, medium stiff, medium to dark brown, moist, fine grained sand, low plasticity, PP=4.50 tsf	
165				R-2	4 8 13			CL	@7': Lean CLAY, stiff, medium to dark brown, moist, trace fine grained sand, low to medium plasticity	CN, DS
	10			R-3	6 10 14	109	20		@10': Lean CLAY, stiff, medium to dark brown, moist, trace fine grained sand, low to medium plasticity, sparse slate fragments, trace gravel, subrounded, PP=3.75/4.50 tsf	
160										
	15			R-4	3 4 9	107	20		@15': Sandy CLAY, medium stiff, dark brown, moist, fine grained sand, sparse gravel and slate, subrounded, PP=2.50/3.50 tsf	
155										
	20			S-1	6 4 8		7	SM	@20': Silty SAND, loose, medium to dark brown, moist, fine grained sand, sparse gravel, subrounded, gravel in soil cuttings, low recovery	
150										
	25			R-5	8 6 4	108	8	CL-ML	@25': Silty CLAY, medium stiff, medium to dark brown, moist, fine grained sand, sparse gravel, subrounded, large fractured subangular slate, PP=4.50/2.50 tsf	
145										
	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

* * * This log is a part of a report by Leighton and should not be used as a stand-alone document. * * *

GEOTECHNICAL BORING LOG LB-4

Project No.	11428.048	**Date Drilled**	9-25-23
Project	Roosevelt TK-K Classroom	**Logged By**	AS
Drilling Co.	MR Drilling Corporation	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	172'
Location	See Figure 2 - *Exploration Location Map*	**Sampled By**	AS

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Bulk / Driven	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			S-2		17 20 7		7	SM	@30': Silty SAND, medium dense, medium to dark brown, moist, fine grained sand, trace clay, sparse gravel, fine gravel, subrounded, sparse fragmented slate	
140										**Total Depth: 31.5 feet** **No groundwater encountered during drilling.** **Backfilled with soil cuttings.**	
	35										
135											
	40										
130											
	45										
125											
	50										
120											
	55										
115											
	60										

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

Leighton

APPENDIX B

Laboratory Test Results

APPENDIX B - GEOTECHNICAL LABORATORY TESTING

Our geotechnical laboratory testing program was directed toward a quantitative and qualitative evaluation of physical and mechanical properties of soils underlying this campus at proposed improvements, and to aid in verifying soil classification. This geotechnical testing was performed at our Irvine laboratory (DSA LEA 63).

Modified Proctor Compaction Curve: Laboratory modified Proctor compaction curves (ASTM D 1557) were established for bulk soil-samples to determine sample-specific modified Proctor laboratory maximum dry density and optimum moisture content. Results of these tests are presented on the following "*Modified Proctor Compaction Test*" sheets in this appendix.

Direct Shear Tests: Direct shear tests were performed, in general accordance with ASTM Test Method D 3080, on remolded soil samples remolded to 90% of the ASTM D 1557 laboratory maximum density. Remolded specimens were soaked for a minimum of 24 hours under a surcharge equal to the applied normal force during testing. After transfer of the sample to the shear box, and reloading the sample, pore pressures set up in the sample due to the transfer were allowed to dissipate for a period of approximately 1 hour prior to application of shearing force. These specimens were tested under various normal loads with a motor-driven, strain-controlled, direct-shear testing apparatus at a strain rate of 0.05 inches per minute (depending upon the soil type). Test results are presented on the *Direct Shear Test Results* sheets which follow in this appendix.

Consolidation: Consolidation tests on relatively undisturbed drive samples from our borings were performed in accordance with ASTM D 2435. Results are included in this appendix on the *One-Dimensional Consolidation Properties of Soils* sheets.

Corrosivity Tests: To evaluate corrosion potential of subsurface soils at the site, we tested a bulk sample collected during our subsurface exploration for pH, electrical resistivity (CTM 532/643), soluble sulfate content (CTM 417 Part II) and soluble chloride content (CTM 422) testing. Results of these tests are enclosed at the end of this appendix.

R-Value Tests: Selected samples were tested in accordance with DOT CA Test 301. The R-Value test measures the response of a compacted sample of soil or aggregate to a vertically applied pressure under specific conditions. This test is used by Caltrans for pavement design, replacing the California bearing ratio test. The R-value of a material is determined when the material is in a state of saturation such that water will be exuded from the compacted test specimen when a 16.8 kN load (2.07 MPa) is applied to test a series of specimens prepared at different moisture contents. R-Value is used in pavement design, with the thickness of each layer dependent on the R-value of the layer below and the expected level of traffic loading, expressed as a Traffic Index. Results of these tests are enclosed at the end of this appendix.

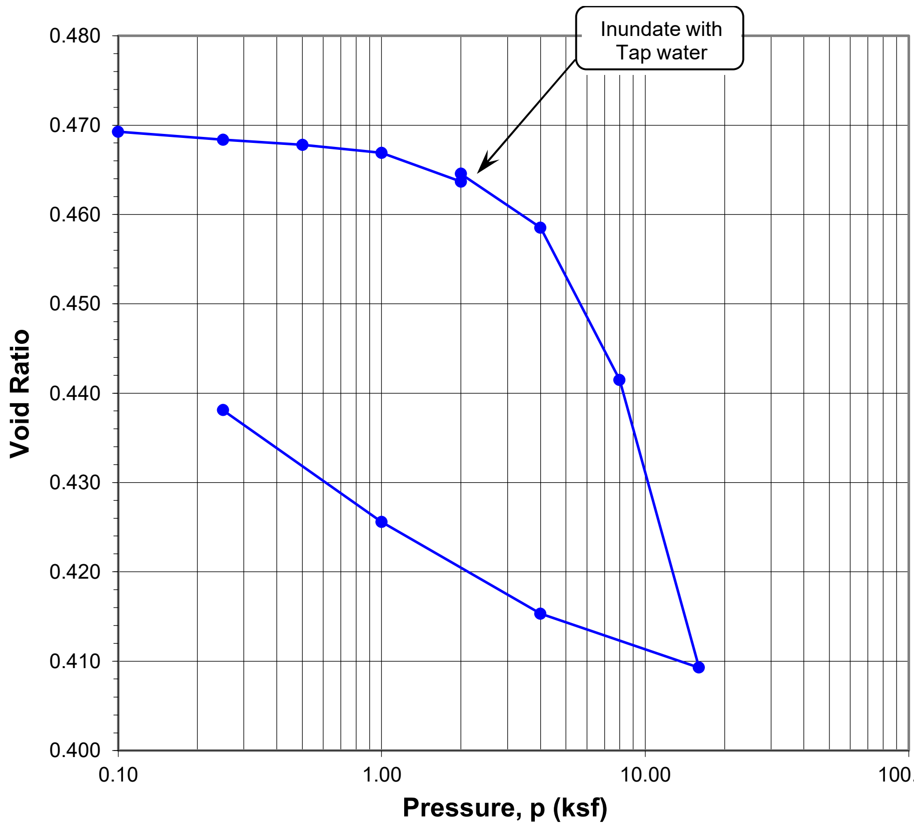
Expansion Tests: In accordance with ASTM D 4829 the specimen is compacted into a metal ring so that the degree of saturation is between 40 and 60 % and the specimen and the ring are placed in a consolidometer. A vertical confining pressure of 1 psi is applied to the specimen and then the specimen is inundated with distilled water. The deformation of the specimen is recorded for 24 hours or until the rate of deformation becomes less than 0.005 mm/hour. The Expansion Index, EI, is used to measure a basic index property of soil and therefore, the EI is comparable to other indices such as the liquid limit, plastic limit, and plasticity index of soils. Results of these tests are enclosed at the end of this appendix.

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Roosevelt TK-K Classroom	Tested By: GB/JD	Date: 10/13/23
Project No.:	11428.048	Checked By: J. Ward	Date: 11/07/23
Boring No.:	LB-1	Depth (ft.): 0-5	
Sample No.:	BB-1	Sample Type:	90% Remold
Soil Identification:	Dark yellowish brown clayey sand (SC)		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	198.01
Weight of Ring (g):	45.26
Height after consol. (in.):	0.9785
Before Test	
Wt. of Wet Sample+Cont. (g):	173.89
Wt. of Dry Sample+Cont. (g):	160.85
Weight of Container (g):	39.70
Initial Moisture Content (%)	10.8
Initial Dry Density (pcf)	114.7
Initial Saturation (%):	62
Initial Vertical Reading (in.)	0.0900
After Test	
Wt. of Wet Sample+Cont. (g):	261.06
Wt. of Dry Sample+Cont. (g):	239.79
Weight of Container (g):	56.85
Final Moisture Content (%)	15.45
Final Dry Density (pcf):	117.0
Final Saturation (%):	95
Final Vertical Reading (in.)	0.1194
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

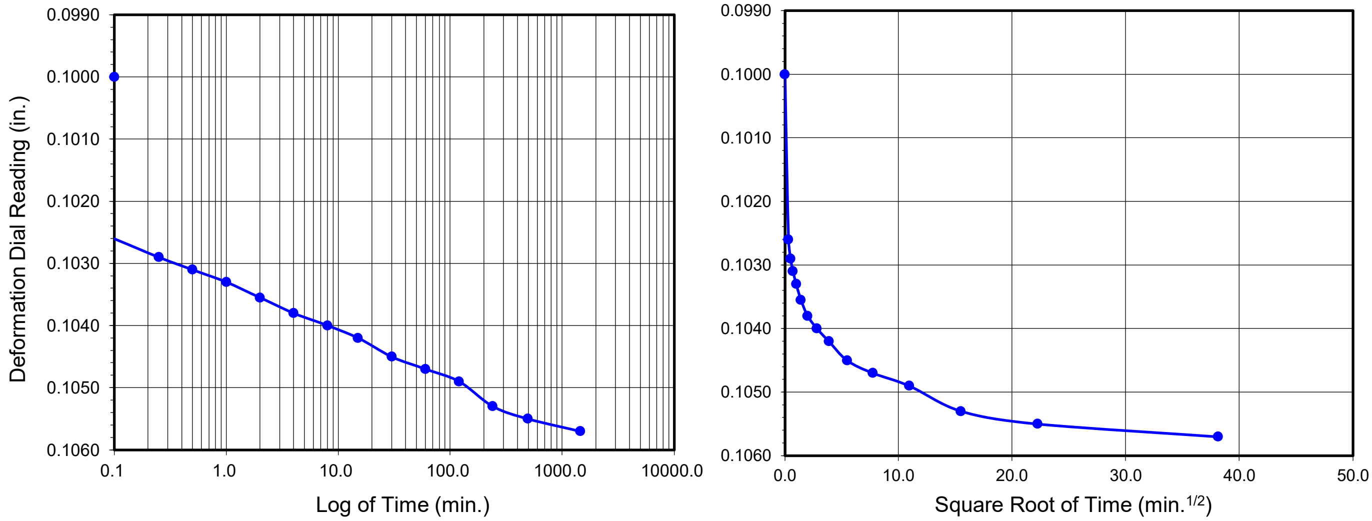


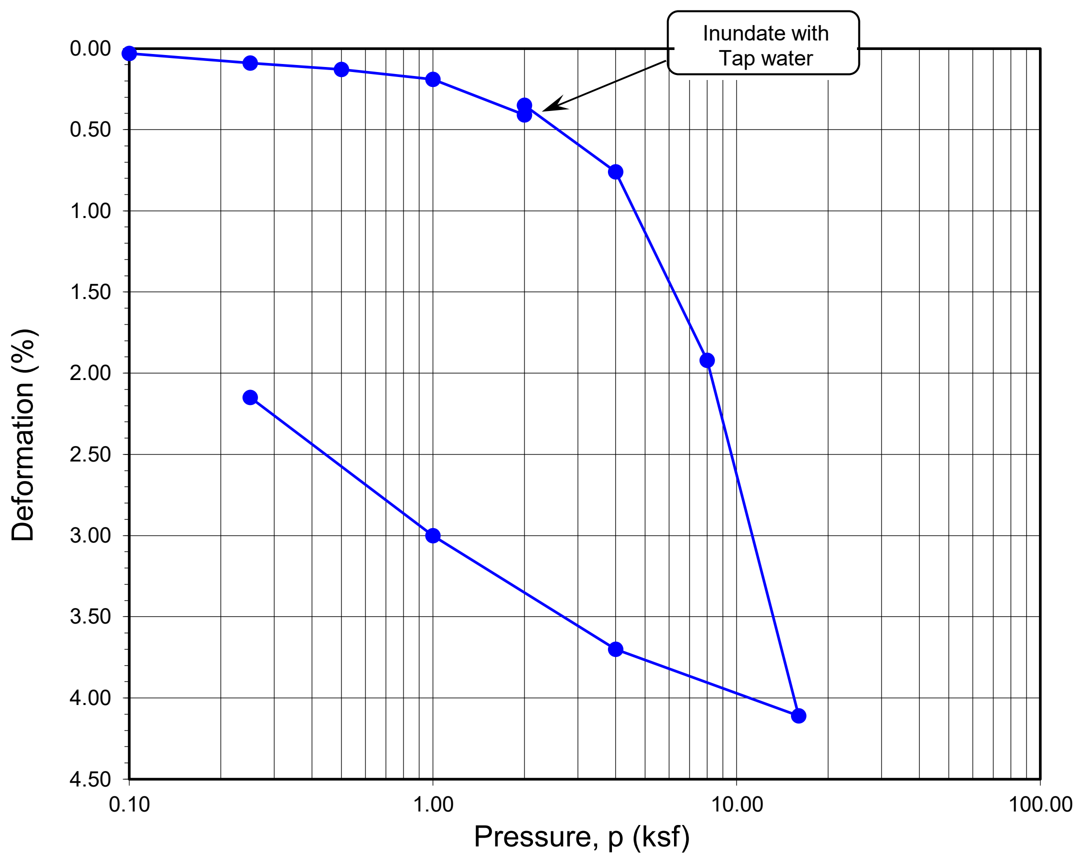
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.0903	0.9997	0.00	0.03	0.469	0.03
0.25	0.0923	0.9977	0.14	0.23	0.468	0.09
0.50	0.0943	0.9957	0.30	0.43	0.468	0.13
1.00	0.0968	0.9932	0.49	0.68	0.467	0.19
2.00	0.1006	0.9894	0.65	1.06	0.464	0.41
2.00	0.1000	0.9900	0.65	1.00	0.465	0.35
4.00	0.1057	0.9843	0.81	1.57	0.459	0.76
8.00	0.1187	0.9713	0.95	2.87	0.441	1.92
16.00	0.1420	0.9480	1.09	5.20	0.409	4.11
4.00	0.1369	0.9531	0.99	4.69	0.415	3.70
1.00	0.1289	0.9611	0.89	3.89	0.426	3.00
0.25	0.1194	0.9706	0.79	2.94	0.438	2.15

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
10/16/23	7:35:00	0.0	0.0	0.1000
10/16/23	7:35:06	0.1	0.3	0.1026
10/16/23	7:35:15	0.2	0.5	0.1029
10/16/23	7:35:30	0.5	0.7	0.1031
10/16/23	7:36:00	1.0	1.0	0.1033
10/16/23	7:37:00	2.0	1.4	0.1036
10/16/23	7:39:00	4.0	2.0	0.1038
10/16/23	7:43:00	8.0	2.8	0.1040
10/16/23	7:50:00	15.0	3.9	0.1042
10/16/23	8:05:00	30.0	5.5	0.1045
10/16/23	8:35:00	60.0	7.7	0.1047
10/16/23	9:35:00	120.0	11.0	0.1049
10/16/23	11:35:00	240.0	15.5	0.1053
10/16/23	15:50:00	495.0	22.2	0.1055
10/17/23	7:50:00	1455.0	38.1	0.1057

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-1	**BB-1**	**0-5**	**10.8**	**15.4**	**114.7**	**117.0**	**0.470**	**0.438**	**62**	**95**

Soil Identification: Dark yellowish brown clayey sand (SC)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11428.048

Roosevelt TK-K Classroom

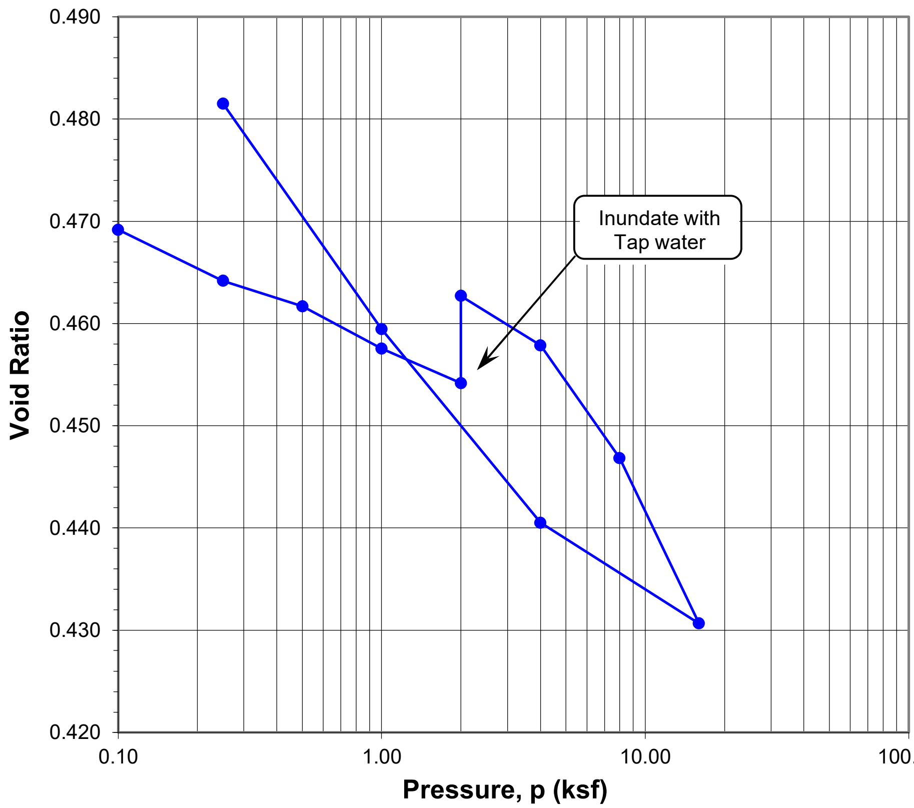
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Roosevelt TK-K Classroom	Tested By:	GB/JD	Date:	10/02/23
Project No.:	11428.048	Checked By:	J. Ward	Date:	11/03/23
Boring No.:	LB-1	Depth (ft.):	5.0		
Sample No.:	R-1	Sample Type:	Ring		
Soil Identification:	Olive lean clay (CL)				

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	202.46
Weight of Ring (g):	43.42
Height after consol. (in.):	1.0080
Before Test	
Wt. of Wet Sample+Cont. (g):	174.89
Wt. of Dry Sample+Cont. (g):	160.51
Weight of Container (g):	55.13
Initial Moisture Content (%)	13.6
Initial Dry Density (pcf)	116.4
Initial Saturation (%):	80
Initial Vertical Reading (in.)	0.0203
After Test	
Wt. of Wet Sample+Cont. (g):	262.18
Wt. of Dry Sample+Cont. (g):	236.33
Weight of Container (g):	56.15
Final Moisture Content (%)	18.90
Final Dry Density (pcf):	112.8
Final Saturation (%):	100
Final Vertical Reading (in.)	0.0151
Specific Gravity (assumed):	2.74
Water Density (pcf):	62.43

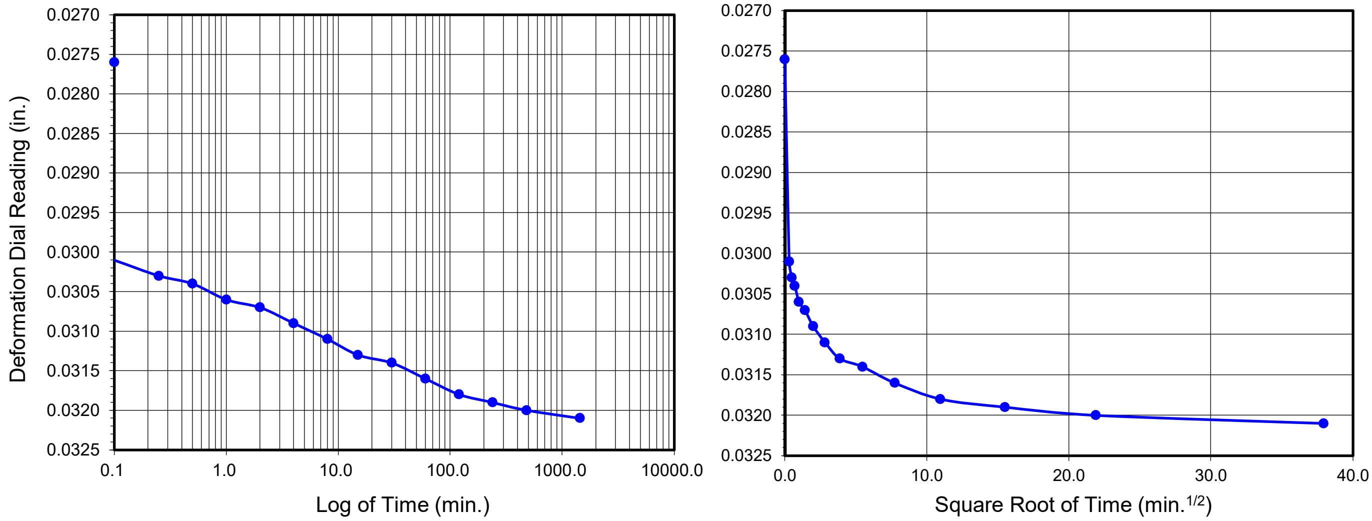


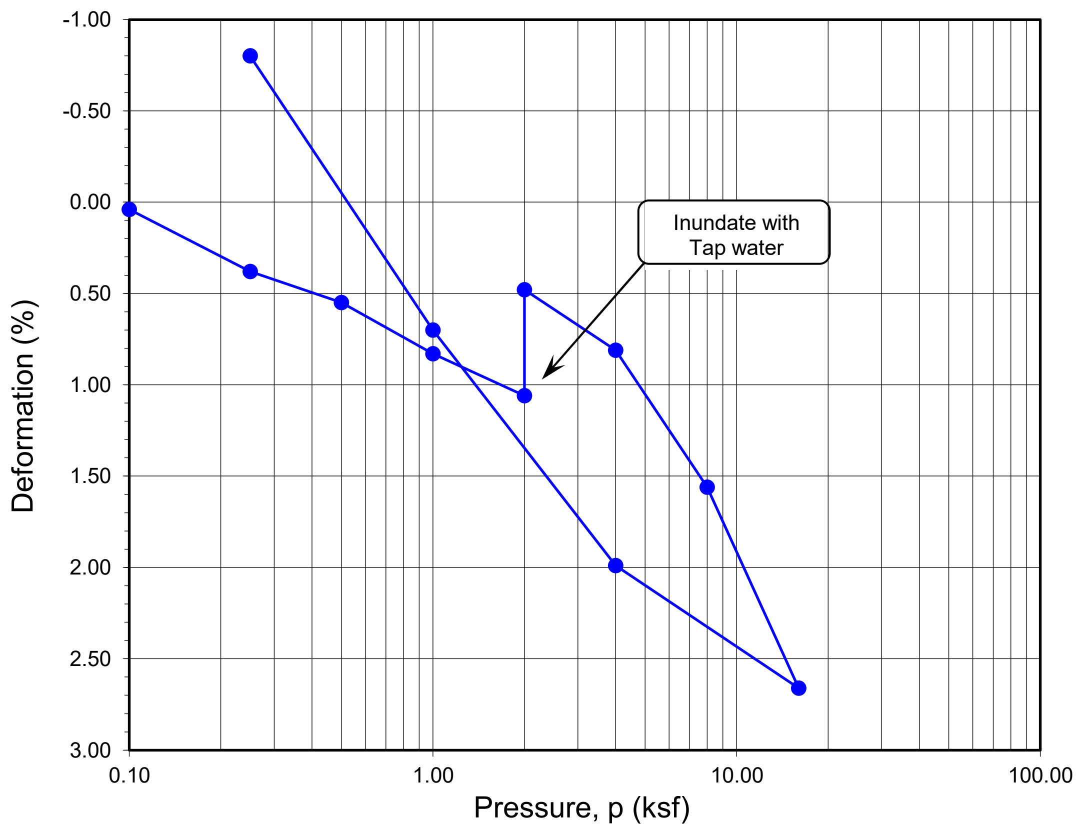
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deforma-tion (%)
0.10	0.0207	0.9996	0.00	0.04	0.469	0.04
0.25	0.0245	0.9958	0.04	0.42	0.464	0.38
0.50	0.0267	0.9936	0.09	0.64	0.462	0.55
1.00	0.0301	0.9902	0.15	0.98	0.458	0.83
2.00	0.0334	0.9869	0.25	1.31	0.454	1.06
2.00	0.0276	0.9927	0.25	0.73	0.463	0.48
4.00	0.0321	0.9882	0.37	1.18	0.458	0.81
8.00	0.0408	0.9795	0.49	2.05	0.447	1.56
16.00	0.0534	0.9669	0.65	3.31	0.431	2.66
4.00	0.0453	0.9750	0.51	2.50	0.441	1.99
1.00	0.0312	0.9891	0.39	1.09	0.459	0.70
0.25	0.0151	1.0052	0.28	-0.52	0.482	-0.80

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
10/5/23	7:40:00	0.0	0.0	0.0276
10/5/23	7:40:06	0.1	0.3	0.0301
10/5/23	7:40:15	0.2	0.5	0.0303
10/5/23	7:40:30	0.5	0.7	0.0304
10/5/23	7:41:00	1.0	1.0	0.0306
10/5/23	7:42:00	2.0	1.4	0.0307
10/5/23	7:44:00	4.0	2.0	0.0309
10/5/23	7:48:00	8.0	2.8	0.0311
10/5/23	7:55:00	15.0	3.9	0.0313
10/5/23	8:10:00	30.0	5.5	0.0314
10/5/23	8:40:00	60.0	7.7	0.0316
10/5/23	9:40:00	120.0	11.0	0.0318
10/5/23	11:40:00	240.0	15.5	0.0319
10/5/23	15:40:00	480.0	21.9	0.0320
10/6/23	7:40:00	1440.0	37.9	0.0321

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-1	**R-1**	**5**	**13.6**	**18.9**	**116.4**	**112.8**	**0.470**	**0.482**	**80**	**100**

Soil Identification: Olive lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11428.048

Roosevelt TK-K Classroom

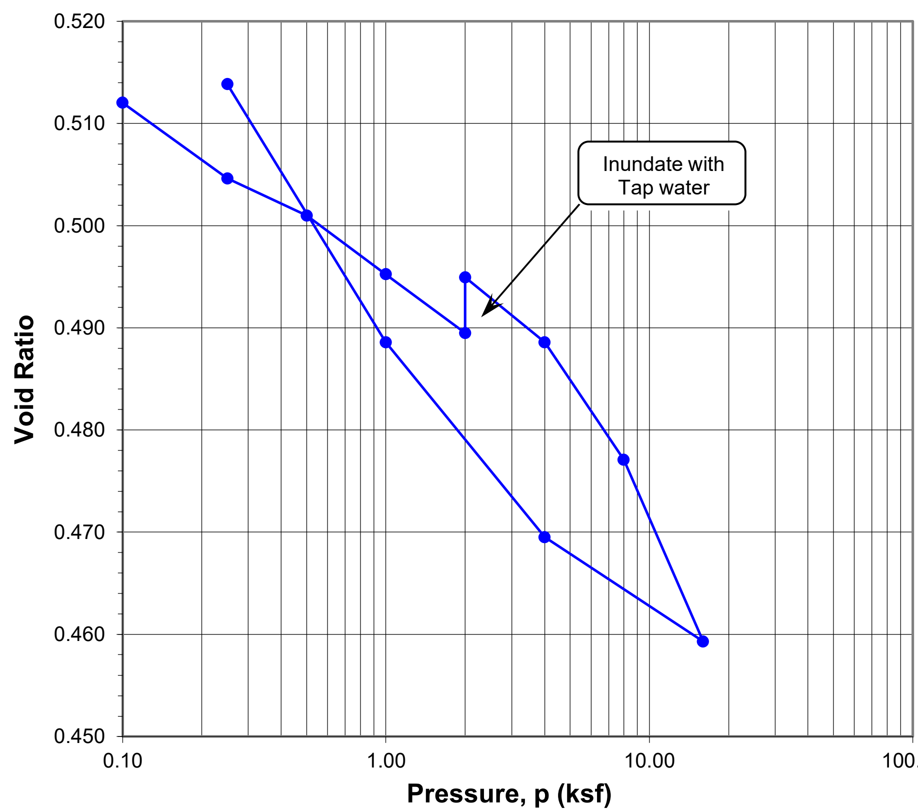
11-23

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Roosevelt TK-K Classroom	Tested By: GB/JD	Date: 10/02/23
Project No.:	11428.048	Checked By: J. Ward	Date: 11/06/23
Boring No.:	LB-1	Depth (ft.): 10.0	
Sample No.:	R-3	Sample Type:	Ring
Soil Identification:	Dark yellowish brown lean clay (CL)		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	203.48
Weight of Ring (g):	41.33
Height after consol. (in.):	1.0007
Before Test	
Wt. of Wet Sample+Cont. (g):	230.25
Wt. of Dry Sample+Cont. (g):	206.85
Weight of Container (g):	63.20
Initial Moisture Content (%)	16.3
Initial Dry Density (pcf)	116.0
Initial Saturation (%):	89
Initial Vertical Reading (in.)	0.0242
After Test	
Wt. of Wet Sample+Cont. (g):	263.91
Wt. of Dry Sample+Cont. (g):	238.43
Weight of Container (g):	57.49
Final Moisture Content (%)	18.25
Final Dry Density (pcf):	116.0
Final Saturation (%):	100
Final Vertical Reading (in.)	0.0263
Specific Gravity (assumed):	2.81
Water Density (pcf):	62.43

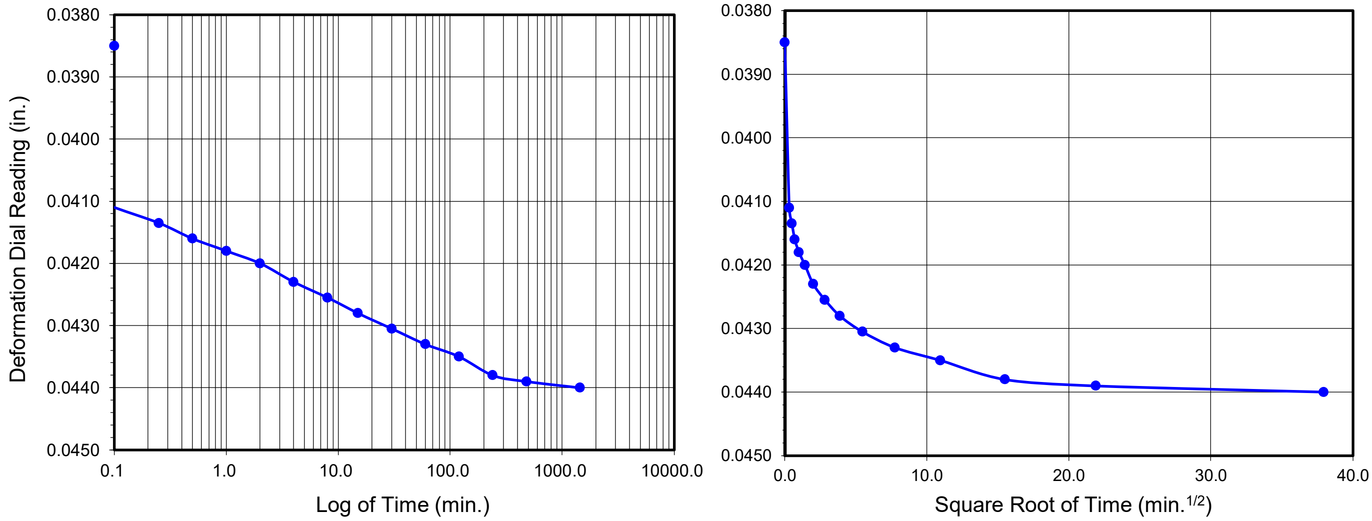


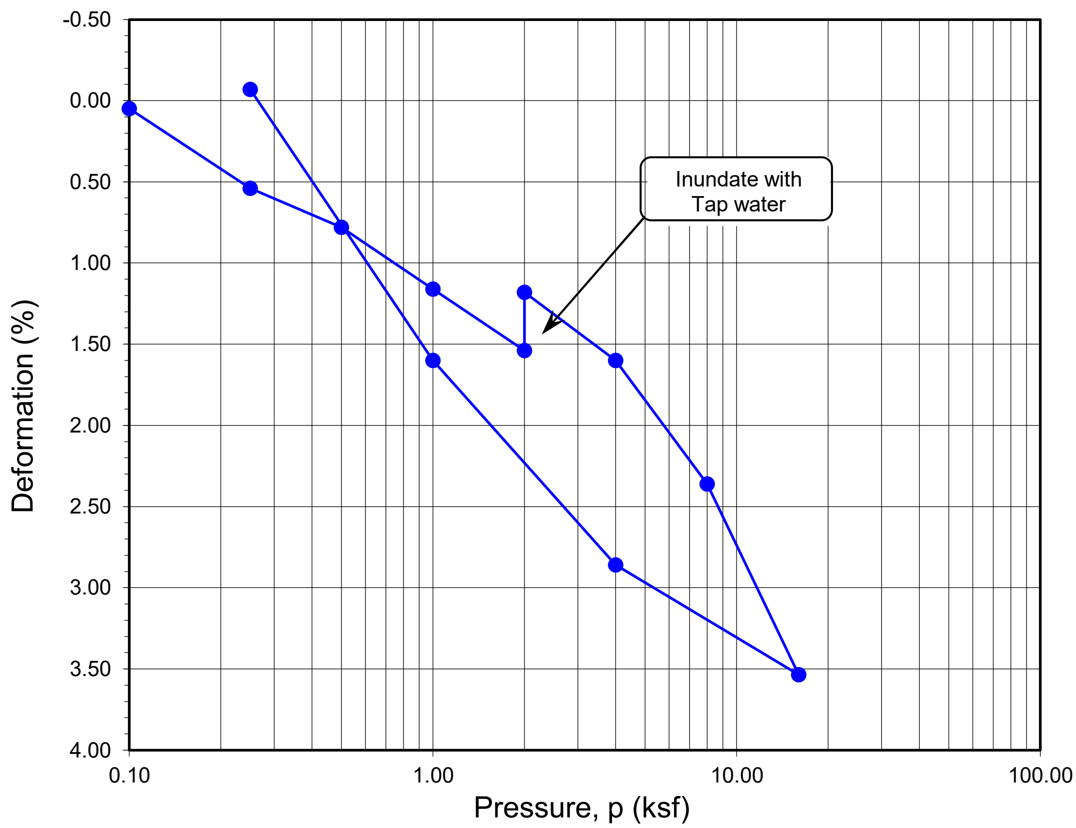
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.0247	0.9995	0.00	0.05	0.512	0.05
0.25	0.0300	0.9942	0.04	0.58	0.505	0.54
0.50	0.0329	0.9913	0.09	0.87	0.501	0.78
1.00	0.0374	0.9868	0.16	1.32	0.495	1.16
2.00	0.0421	0.9821	0.25	1.79	0.489	1.54
2.00	0.0385	0.9857	0.25	1.43	0.495	1.18
4.00	0.0440	0.9802	0.38	1.98	0.489	1.60
8.00	0.0529	0.9713	0.51	2.87	0.477	2.36
16.00	0.0662	0.9581	0.66	4.20	0.459	3.54
4.00	0.0580	0.9662	0.52	3.38	0.470	2.86
1.00	0.0440	0.9802	0.38	1.98	0.489	1.60
0.25	0.0263	0.9979	0.28	0.21	0.514	-0.07

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
10/5/23	7:45:00	0.0	0.0	0.0385
10/5/23	7:45:06	0.1	0.3	0.0411
10/5/23	7:45:15	0.2	0.5	0.0414
10/5/23	7:45:30	0.5	0.7	0.0416
10/5/23	7:46:00	1.0	1.0	0.0418
10/5/23	7:47:00	2.0	1.4	0.0420
10/5/23	7:49:00	4.0	2.0	0.0423
10/5/23	7:53:00	8.0	2.8	0.0426
10/5/23	8:00:00	15.0	3.9	0.0428
10/5/23	8:15:00	30.0	5.5	0.0431
10/5/23	8:45:00	60.0	7.7	0.0433
10/5/23	9:45:00	120.0	11.0	0.0435
10/5/23	11:45:00	240.0	15.5	0.0438
10/5/23	15:45:00	480.0	21.9	0.0439
10/6/23	7:45:00	1440.0	37.9	0.0440

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-1	**R-3**	**10**	**16.3**	**18.3**	**116.0**	**116.0**	**0.513**	**0.514**	**89**	**100**

Soil Identification: Dark yellowish brown lean clay (CL)

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11428.048

Roosevelt TK-K Classroom

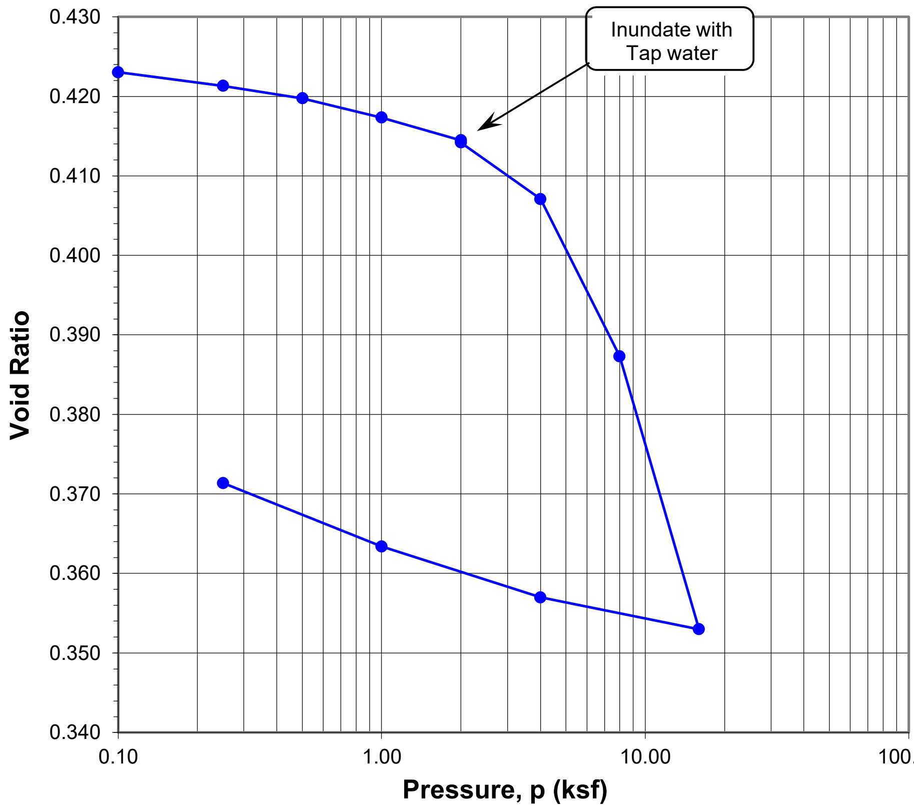
ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Leighton

Project Name:	Roosevelt TK-K Classroom	Tested By: GB/JD	Date: 10/13/23
Project No.:	11428.048	Checked By: J. Ward	Date: 11/07/23
Boring No.:	LB-4	Depth (ft.): 0-5	
Sample No.:	BB-1	Sample Type:	90% Remold
Soil Identification:	Dark brown silty, clayey sand with gravel (SC-SM)g		

Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	201.17
Weight of Ring (g):	45.84
Height after consol. (in.):	0.9636
Before Test	
Wt. of Wet Sample+Cont. (g):	185.48
Wt. of Dry Sample+Cont. (g):	175.72
Weight of Container (g):	68.09
Initial Moisture Content (%)	9.1
Initial Dry Density (pcf)	118.4
Initial Saturation (%):	58
Initial Vertical Reading (in.)	0.1224
After Test	
Wt. of Wet Sample+Cont. (g):	271.77
Wt. of Dry Sample+Cont. (g):	252.78
Weight of Container (g):	64.68
Final Moisture Content (%)	13.35
Final Dry Density (pcf):	122.8
Final Saturation (%):	97
Final Vertical Reading (in.)	0.1608
Specific Gravity (assumed):	2.70
Water Density (pcf):	62.43

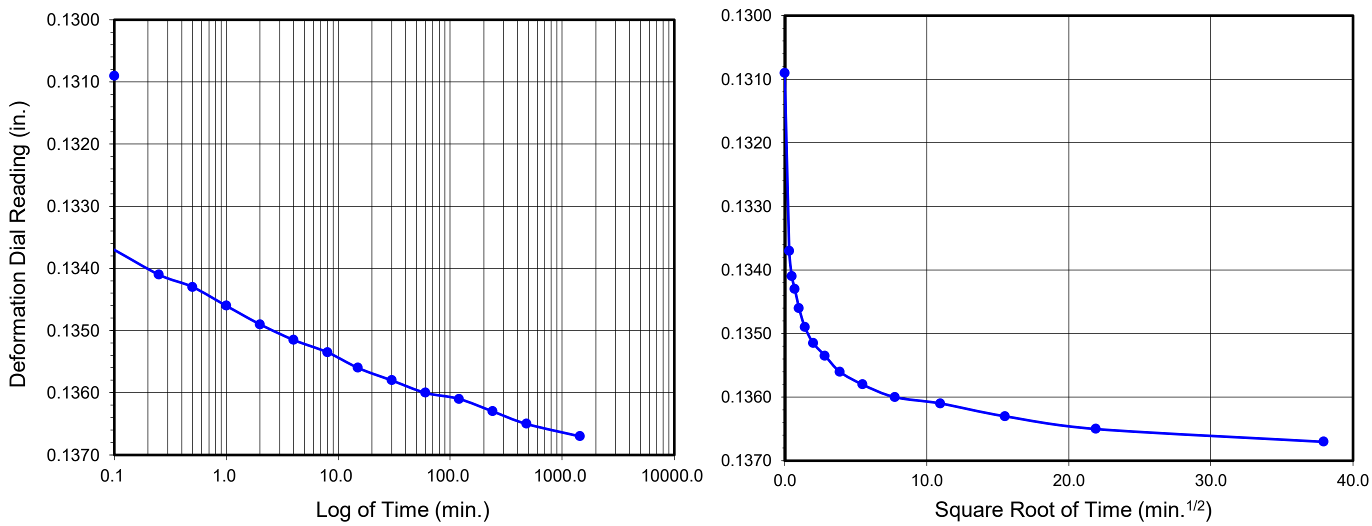


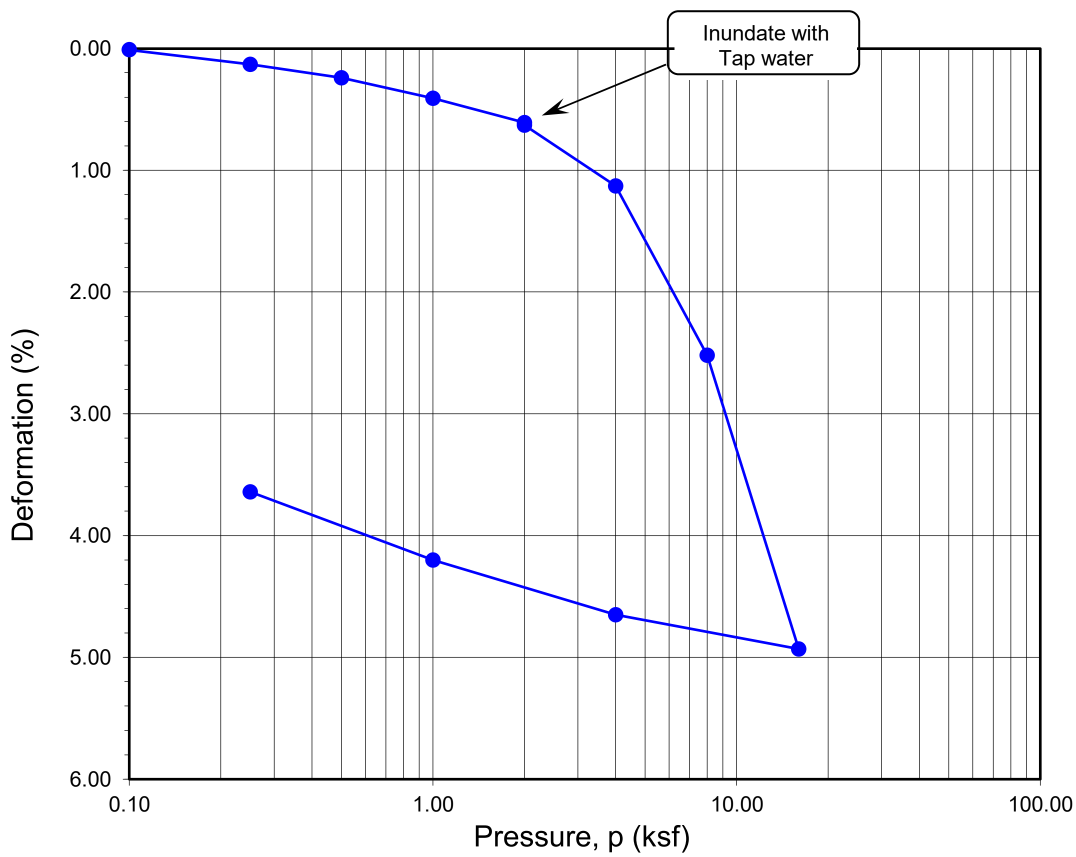
Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.1225	0.9999	0.00	0.01	0.423	0.01
0.25	0.1241	0.9983	0.04	0.17	0.421	0.13
0.50	0.1257	0.9967	0.09	0.33	0.420	0.24
1.00	0.1280	0.9944	0.15	0.56	0.417	0.41
2.00	0.1307	0.9917	0.22	0.83	0.414	0.61
2.00	0.1309	0.9915	0.22	0.85	0.414	0.63
4.00	0.1367	0.9857	0.30	1.43	0.407	1.13
8.00	0.1516	0.9708	0.40	2.92	0.387	2.52
16.00	0.1770	0.9454	0.53	5.46	0.353	4.93
4.00	0.1730	0.9494	0.41	5.06	0.357	4.65
1.00	0.1674	0.9550	0.30	4.50	0.363	4.20
0.25	0.1608	0.9616	0.20	3.84	0.371	3.64

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
10/16/23	7:40:00	0.0	0.0	0.1309
10/16/23	7:40:06	0.1	0.3	0.1337
10/16/23	7:40:15	0.2	0.5	0.1341
10/16/23	7:40:30	0.5	0.7	0.1343
10/16/23	7:41:00	1.0	1.0	0.1346
10/16/23	7:42:00	2.0	1.4	0.1349
10/16/23	7:44:00	4.0	2.0	0.1352
10/16/23	7:48:00	8.0	2.8	0.1354
10/16/23	7:55:00	15.0	3.9	0.1356
10/16/23	8:10:00	30.0	5.5	0.1358
10/16/23	8:40:00	60.0	7.7	0.1360
10/16/23	9:40:00	120.0	11.0	0.1361
10/16/23	11:40:00	240.0	15.5	0.1363
10/16/23	15:40:00	480.0	21.9	0.1365
10/17/23	7:40:00	1440.0	37.9	0.1367

Time Readings @ 4.0 ksf





Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-4	**BB-1**	**0-5**	**9.1**	**13.3**	**118.4**	**122.8**	**0.423**	**0.371**	**58**	**97**

Soil Identification: Dark brown silty, clayey sand with gravel (SC-SM)g

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11428.048

Roosevelt TK-K Classroom

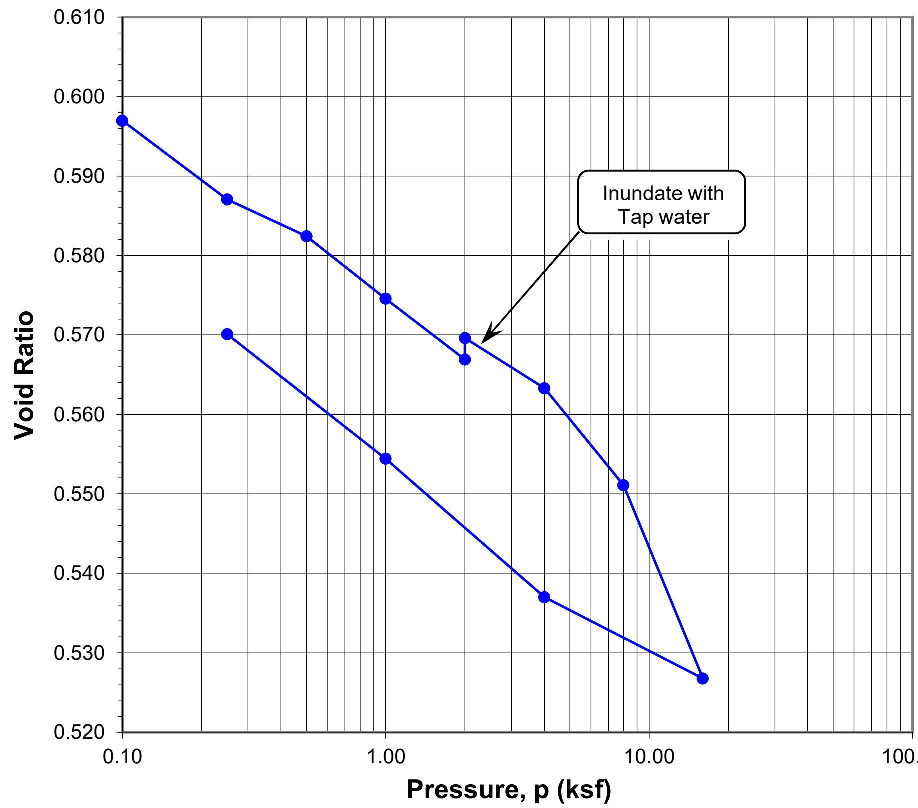
11-23

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS

ASTM D 2435

Project Name:	Roosevelt TK-K Classroom	Tested By: GB/JD	Date: 10/02/23
Project No.:	11428.048	Checked By: J. Ward	Date: 11/06/23
Boring No.:	LB-4	Depth (ft.): 7.0	
Sample No.:	R-2	Sample Type: Ring	
Soil Identification:	Dark yellowish brown lean clay (CL)		

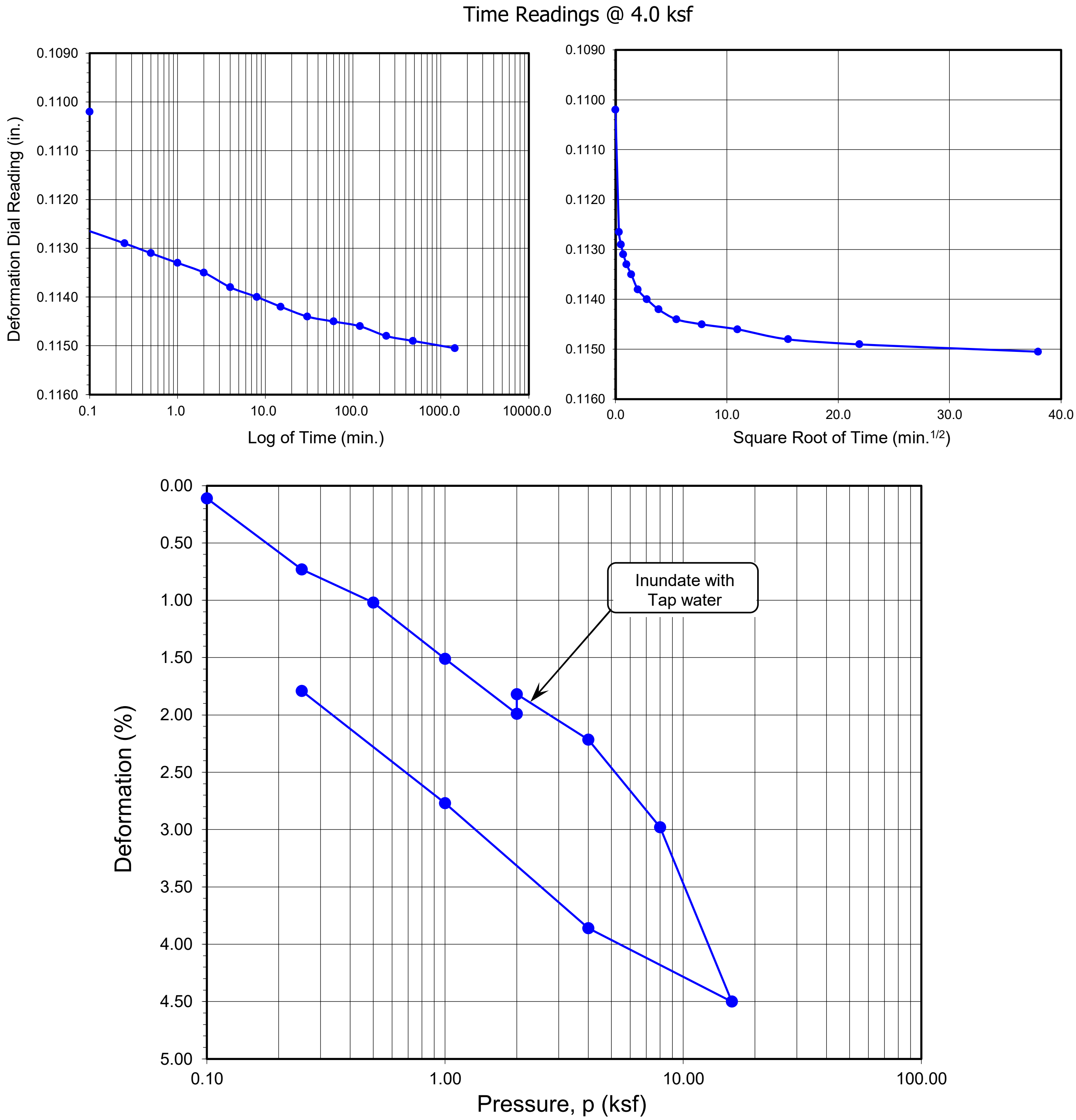
Sample Diameter (in.):	2.415
Sample Thickness (in.):	1.000
Weight of Sample + ring (g):	200.84
Weight of Ring (g):	44.29
Height after consol. (in.):	0.9821
Before Test	
Wt. of Wet Sample+Cont. (g):	199.13
Wt. of Dry Sample+Cont. (g):	174.63
Weight of Container (g):	56.84
Initial Moisture Content (%)	20.8
Initial Dry Density (pcf)	107.8
Initial Saturation (%):	96
Initial Vertical Reading (in.)	0.0896
After Test	
Wt. of Wet Sample+Cont. (g):	239.02
Wt. of Dry Sample+Cont. (g):	212.22
Weight of Container (g):	38.47
Final Moisture Content (%)	20.70
Final Dry Density (pcf):	109.6
Final Saturation (%):	100
Final Vertical Reading (in.)	0.1109
Specific Gravity (assumed):	2.76
Water Density (pcf):	62.43



Pressure (p) (ksf)	Final Reading (in.)	Apparent Thickness (in.)	Load Compliance (%)	Deformation % of Sample Thickness	Void Ratio	Corrected Deformation (%)
0.10	0.0907	0.9989	0.00	0.11	0.597	0.11
0.25	0.0973	0.9923	0.04	0.77	0.587	0.73
0.50	0.1007	0.9889	0.09	1.11	0.582	1.02
1.00	0.1063	0.9833	0.16	1.67	0.575	1.51
2.00	0.1119	0.9777	0.24	2.23	0.567	1.99
2.00	0.1102	0.9794	0.24	2.06	0.570	1.82
4.00	0.1151	0.9746	0.33	2.55	0.563	2.22
8.00	0.1239	0.9657	0.45	3.43	0.551	2.98
16.00	0.1403	0.9493	0.57	5.07	0.527	4.50
4.00	0.1329	0.9567	0.47	4.33	0.537	3.86
1.00	0.1213	0.9683	0.40	3.17	0.554	2.77
0.25	0.1109	0.9787	0.34	2.13	0.570	1.79

Time Readings @ 4.0 ksf

Date	Time	Elapsed Time (min)	Square Root of Time	Dial Rdgs. (in.)
10/5/23	7:50:00	0.0	0.0	0.1102
10/5/23	7:50:06	0.1	0.3	0.1127
10/5/23	7:50:15	0.2	0.5	0.1129
10/5/23	7:50:30	0.5	0.7	0.1131
10/5/23	7:51:00	1.0	1.0	0.1133
10/5/23	7:52:00	2.0	1.4	0.1135
10/5/23	7:54:00	4.0	2.0	0.1138
10/5/23	7:58:00	8.0	2.8	0.1140
10/5/23	8:05:00	15.0	3.9	0.1142
10/5/23	8:20:00	30.0	5.5	0.1144
10/5/23	8:50:00	60.0	7.7	0.1145
10/5/23	9:50:00	120.0	11.0	0.1146
10/5/23	11:50:00	240.0	15.5	0.1148
10/5/23	15:50:00	480.0	21.9	0.1149
10/6/23	7:50:00	1440.0	37.9	0.1151



Boring No.	Sample No.	Depth (ft.)	Moisture Content (%)		Dry Density (pcf)		Void Ratio		Degree of Saturation (%)	
			Initial	Final	Initial	Final	Initial	Final	Initial	Final
LB-4	**R-2**	**7**	**20.8**	**20.7**	**107.8**	**109.6**	**0.599**	**0.570**	**96**	**100**

Soil Identification: Dark yellowish brown lean clay (CL)

Leighton

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES of SOILS
ASTM D 2435

Project No.: 11428.048

Roosevelt TK-K Classroom

11-23

Leighton

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: Roosevelt TK-K Classroom   Tested By : GEB/JD   Date: 10/12/23

Project No. : 11428.048   Checked By: J. Ward   Date: 11/07/23

Boring No.	LB-1	LB-4		
Sample No.	B-1	B-1		
Sample Depth (ft)	0-5	0-5		
Soil Identification:	Dark yellowish brown SC	Dark brown (SC-SM)g		
Wet Weight of Soil + Container (g)	0.00	0.00		
Dry Weight of Soil + Container (g)	0.00	0.00		
Weight of Container (g)	1.00	1.00		
Moisture Content (%)	0.00	0.00		
Weight of Soaked Soil (g)	100.03	100.03		

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	401	402		
Crucible No.	2	4		
Furnace Temperature (°C)	860	860		
Time In / Time Out	9:15/10:00	9:15/10:00		
Duration of Combustion (min)	45	45		
Wt. of Crucible + Residue (g)	28.7301	21.6378		
Wt. of Crucible (g)	28.7227	21.6332		
Wt. of Residue (g) (A)	0.0074	0.0046		
PPM of Sulfate (A) x 41150	304.51	189.29		
PPM of Sulfate, Dry Weight Basis	**305**	**189**		

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	15	15		
ml of AgNO3 Soln. Used in Titration (C)	0.4	0.5		
PPM of Chloride (C -0.2) * 100 * 30 / B	40	60		
PPM of Chloride, Dry Wt. Basis	**40**	**60**		

pH TEST, DOT California Test 643

pH Value	**7.38**	**6.87**		
Temperature °C	20.2	20.2		

SOIL RESISTIVITY TEST
DOT CA TEST 643

Leighton

Project Name:	Roosevelt TK-K Classroom	Tested By :	G. Berdy	Date:	10/18/23
Project No. :	11428.048	Checked By:	J. Ward	Date:	11/07/23
Boring No.:	LB-1	Depth (ft.) :	0-5		
Sample No. :	B-1				

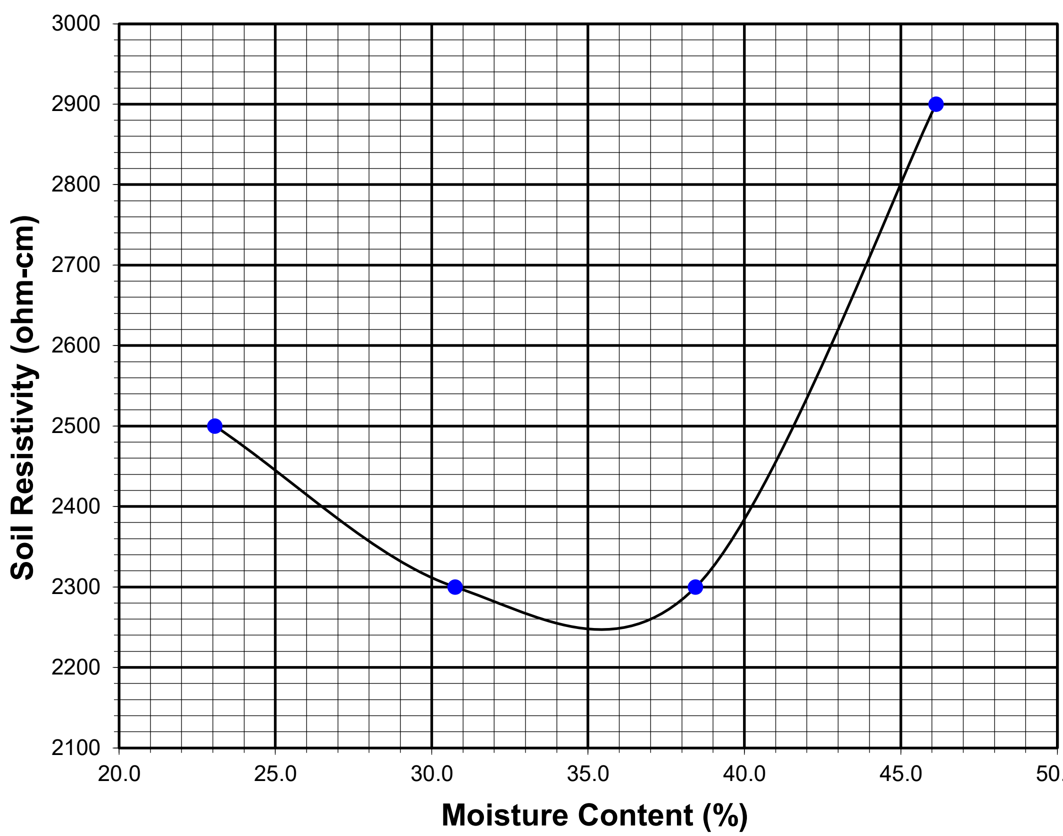
Soil Identification:* Dark yellowish brown SC

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	30	23.06	2500	2500
2	40	30.75	2300	2300
3	50	38.44	2300	2300
4	60	46.13	2900	2900
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.08
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2240	**35.4**	**305**	**40**	**7.38**	**20.2**



SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	Roosevelt TK-K Classroom	Tested By :	G. Berdy	Date:	10/18/23
Project No. :	11428.048	Checked By:	J. Ward	Date:	11/07/23
Boring No.:	LB-4	Depth (ft.) :	0-5		
Sample No. :	B-1				

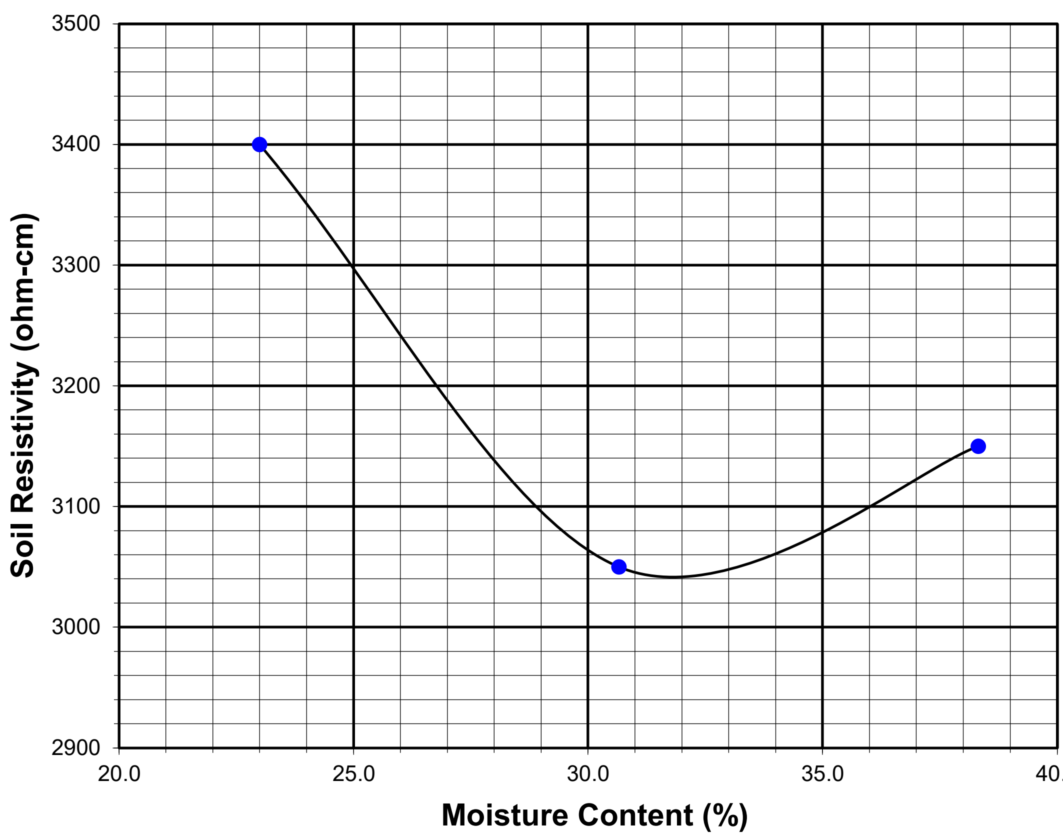
Soil Identification:* Dark brown (SC-SM)g

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	30	22.99	3400	3400
2	40	30.66	3050	3050
3	50	38.32	3150	3150
4				
5				

Moisture Content (%) (MCi)	0.00
Wet Wt. of Soil + Cont. (g)	0.00
Dry Wt. of Soil + Cont. (g)	0.00
Wt. of Container (g)	1.00
Container No.	
Initial Soil Wt. (g) (Wt)	130.47
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
3040	**31.8**	**189**	**60**	**6.87**	**20.2**



DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: Roosevelt TK-K Classroom
Tested By: G. Bathala
Date: 10/13/23

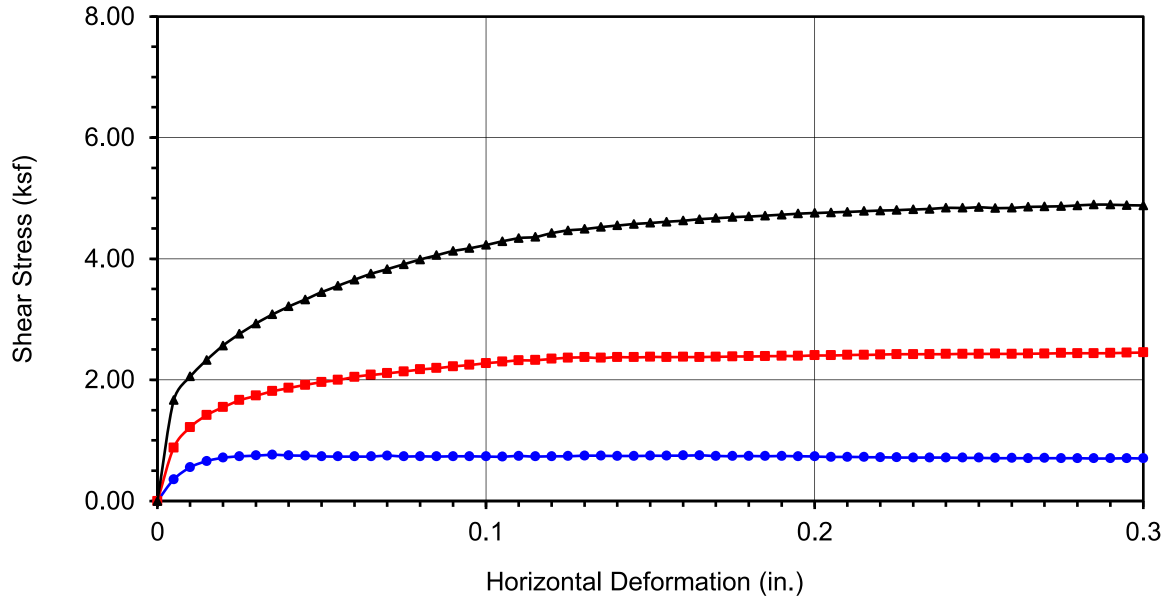
Project No.: 11428.048
Checked By: J. Ward
Date: 11/06/23

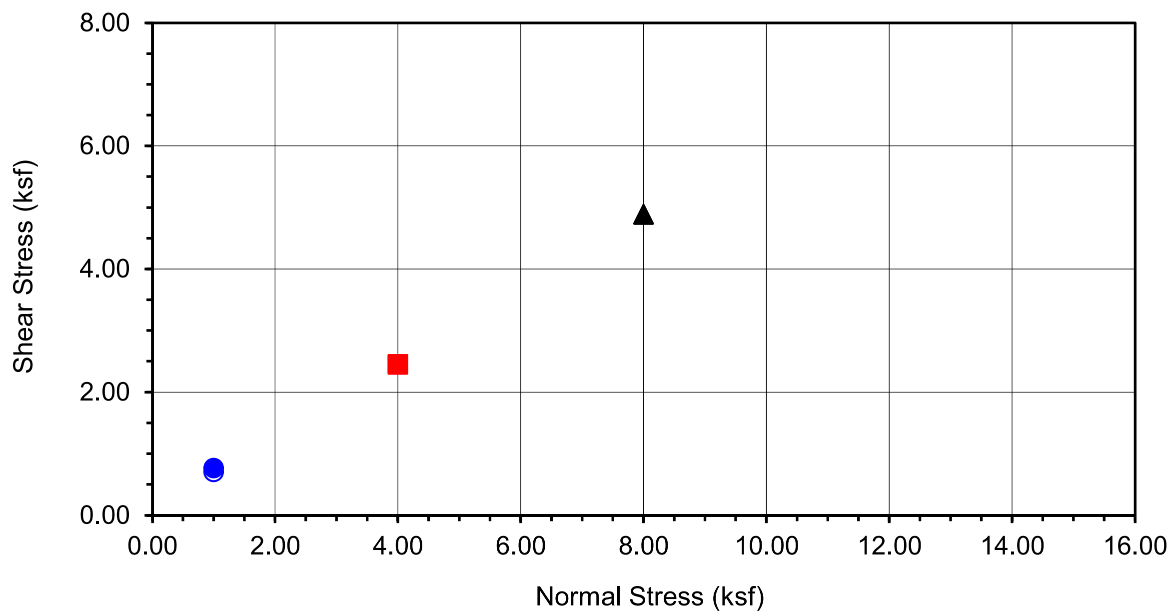
Boring No.: LB-1
Sample Type: 90% Remold

Sample No.: BB-1
Depth (ft.): 0-5

Soil Identification: Dark yellowish brown clayey sand (SC)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	197.39	198.37	198.58
Weight of Ring(gm):	44.56	45.62	45.48
Before Shearing			
Weight of Wet Sample+Cont.(gm):	173.89	173.89	173.89
Weight of Dry Sample+Cont.(gm):	160.85	160.85	160.85
Weight of Container(gm):	39.70	39.70	39.70
Vertical Rdg.(in): Initial	0.0000	0.2681	0.2960
Vertical Rdg.(in): Final	0.0007	0.2630	0.3154
After Shearing			
Weight of Wet Sample+Cont.(gm):	231.13	215.18	211.24
Weight of Dry Sample+Cont.(gm):	208.29	194.34	191.10
Weight of Container(gm):	72.43	59.15	55.32
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1**
Sample No.	**BB-1**
Depth (ft)	**0-5**

Sample Type:

90% Remold

Soil Identification:

Dark yellowish brown clayey sand (SC)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.764	■ 2.452	▲ 4.895
Shear Stress @ End of Test (ksf)	○ 0.704	□ 2.452	△ 4.882
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	10.76	10.76	10.76
Dry Density (pcf)	114.8	114.7	115.0
Saturation (%)	62.0	61.9	62.3
Soil Height Before Shearing (in.)	1.0007	1.0051	0.9806
Final Moisture Content (%)	16.8	15.4	14.8

Leighton

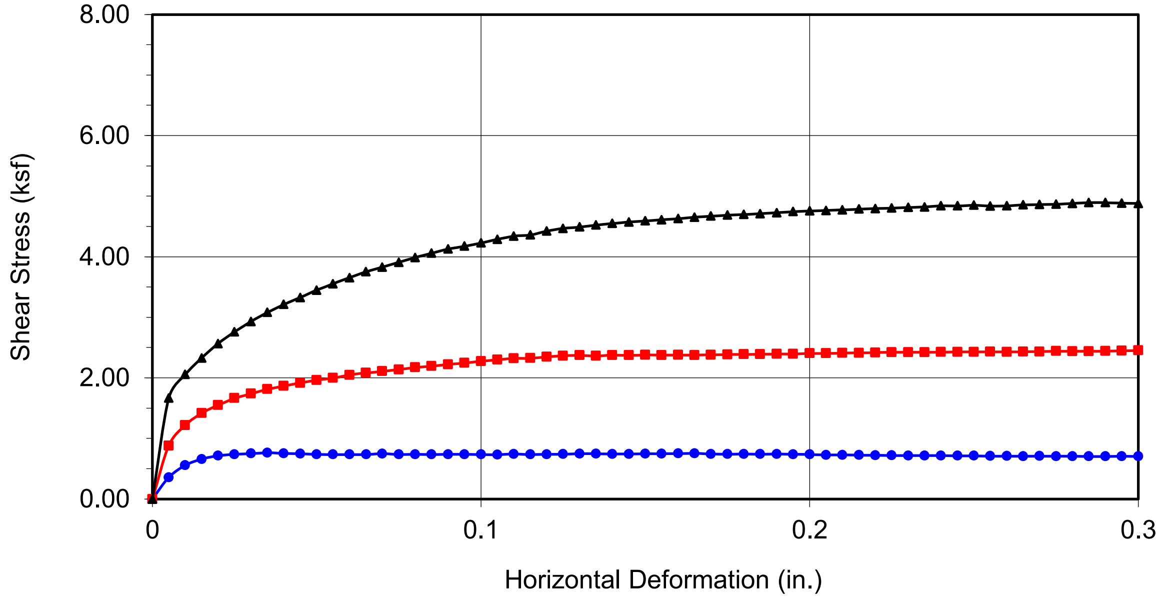
DIRECT SHEAR TEST RESULTS

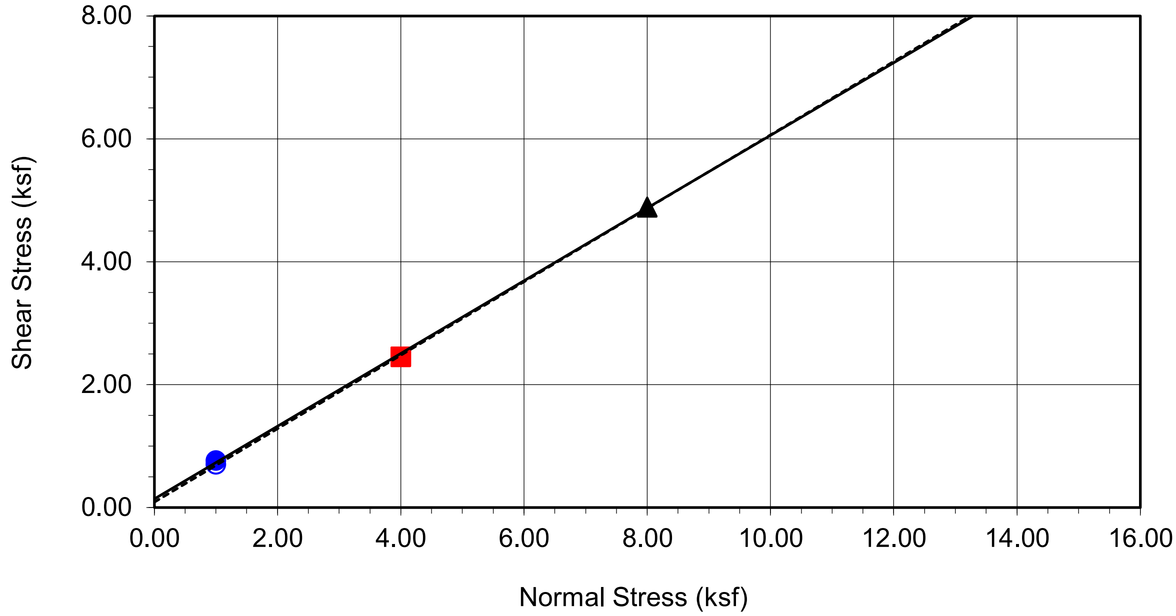
Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

10-23





Boring No.	**LB-1**
Sample No.	**BB-1**
Depth (ft)	**0-5**
Sample Type:	90% Remold
Soil Identification: Dark yellowish brown clayey sand (SC)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	142	31
Ultimate	90	31

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.764	■ 2.452	▲ 4.895
Shear Stress @ End of Test (ksf)	○ 0.704	□ 2.452	△ 4.882
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	10.76	10.76	10.76
Dry Density (pcf)	114.8	114.7	115.0
Saturation (%)	62.0	61.9	62.3
Soil Height Before Shearing (in.)	1.0007	1.0051	0.9806
Final Moisture Content (%)	16.8	15.4	14.8

Leighton

DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

10-23

Leighton

DIRECT SHEAR TEST

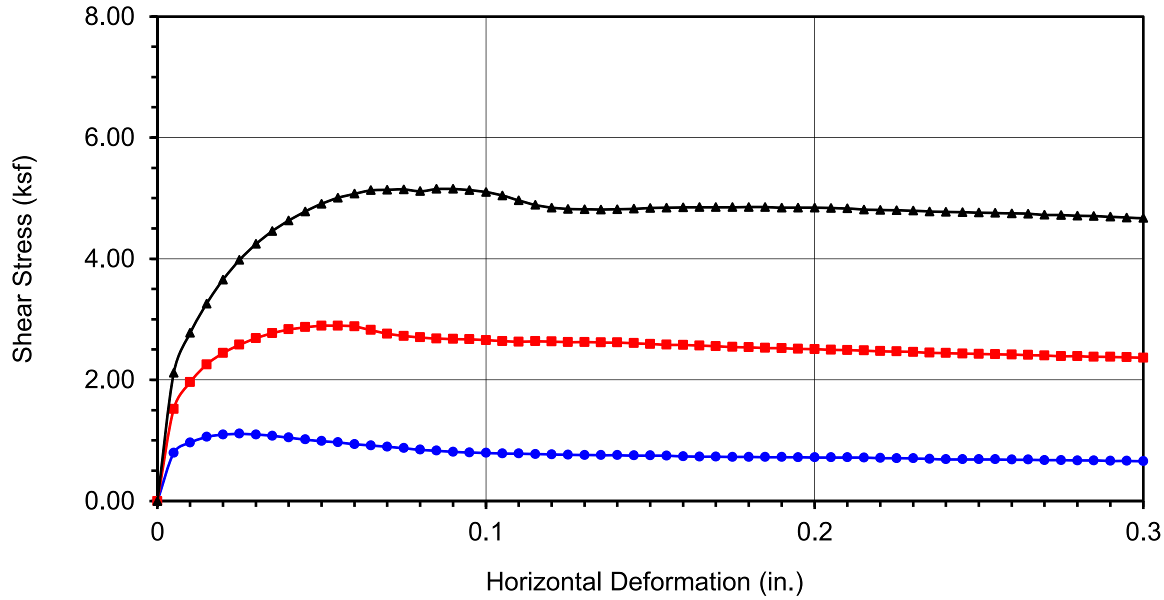
Consolidated Drained - ASTM D 3080

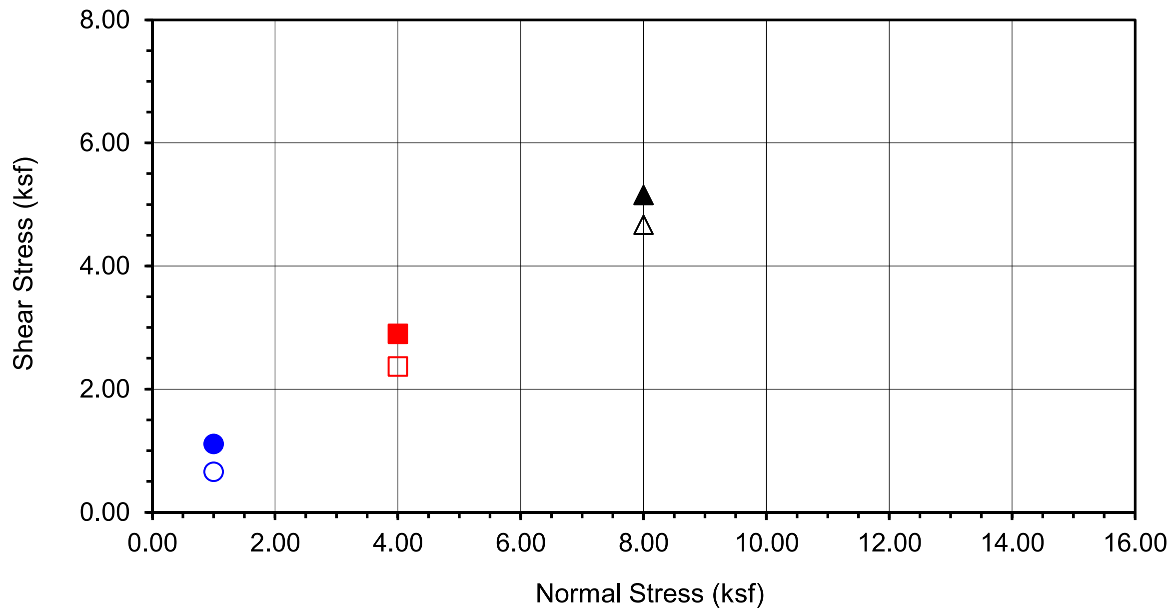
Project Name: Roosevelt TK-K Classroom
Project No.: 11428.048
Boring No.: LB-1
Sample No.: R-1
Soil Identification: Olive lean clay (CL)

Tested By: G. Bathala
Checked By: J. Ward
Sample Type: Ring
Depth (ft.): 5.0

Date: 10/06/23
Date: 11/03/23

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	202.06	202.42	204.02
Weight of Ring(gm):	45.60	44.95	45.84
Before Shearing			
Weight of Wet Sample+Cont.(gm):	174.89	174.89	174.89
Weight of Dry Sample+Cont.(gm):	160.51	160.51	160.51
Weight of Container(gm):	55.13	55.13	55.13
Vertical Rdg.(in): Initial	0.2529	0.2457	0.0000
Vertical Rdg.(in): Final	0.2532	0.2639	-0.0216
After Shearing			
Weight of Wet Sample+Cont.(gm):	223.03	229.51	196.63
Weight of Dry Sample+Cont.(gm):	196.69	204.44	172.27
Weight of Container(gm):	61.47	68.54	36.53
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type: Ring	
Soil Identification: Olive lean clay (CL)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.110	■ 2.895	▲ 5.153
Shear Stress @ End of Test (ksf)	○ 0.657	□ 2.367	△ 4.672
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	13.65	13.65	13.65
Dry Density (pcf)	114.5	115.2	115.8
Saturation (%)	78.0	79.6	80.8
Soil Height Before Shearing (in.)	0.9997	0.9818	0.9784
Final Moisture Content (%)	19.5	18.4	17.9

Leighton

DIRECT SHEAR TEST RESULTS

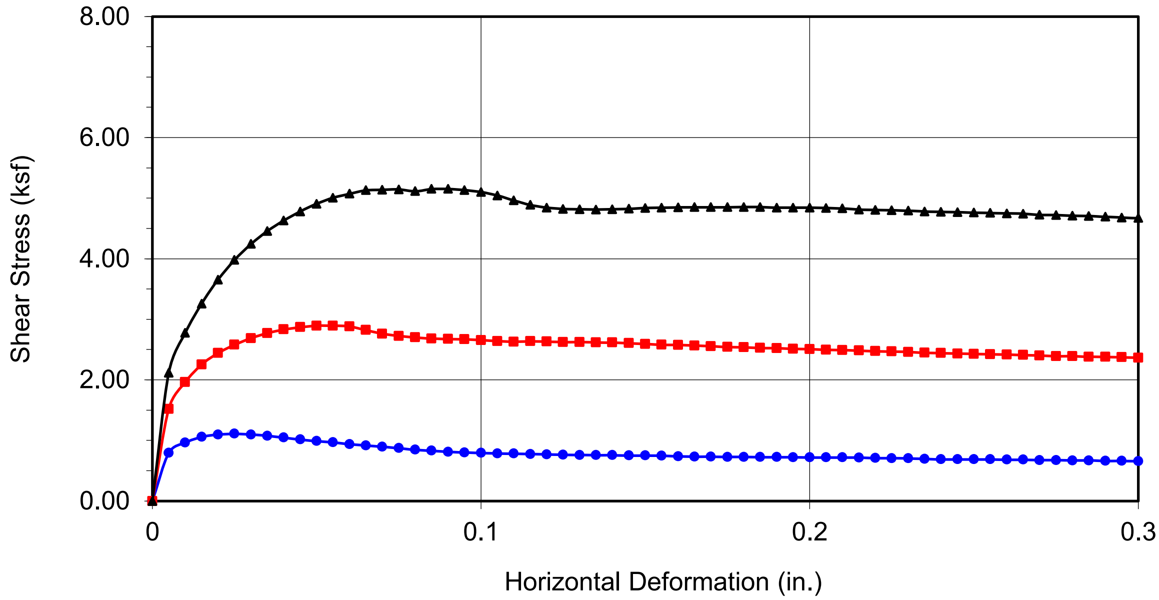
Consolidated Drained - ASTM D 3080

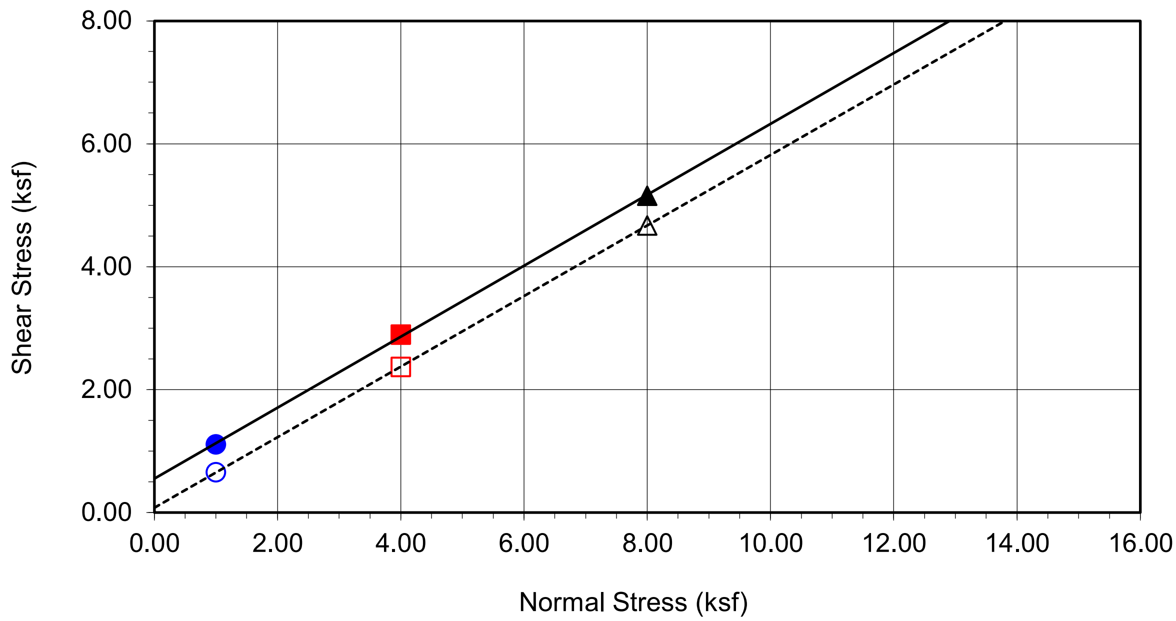
Project No.: 11428.048

Roosevelt TK-K Classroom

10-23

DS LB-1, R-1 @ 5





Boring No.	**LB-1**
Sample No.	**R-1**
Depth (ft)	**5**
Sample Type:	Ring
Soil Identification: Olive lean clay (CL)	

Strength Parameters

	C (psf)	ϕ (°)
Peak	553	30
Ultimate	79	30

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.110	■ 2.895	▲ 5.153
Shear Stress @ End of Test (ksf)	○ 0.657	□ 2.367	△ 4.672
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	13.65	13.65	13.65
Dry Density (pcf)	114.5	115.2	115.8
Saturation (%)	78.0	79.6	80.8
Soil Height Before Shearing (in.)	0.9997	0.9818	0.9784
Final Moisture Content (%)	19.5	18.4	17.9

Leighton

DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

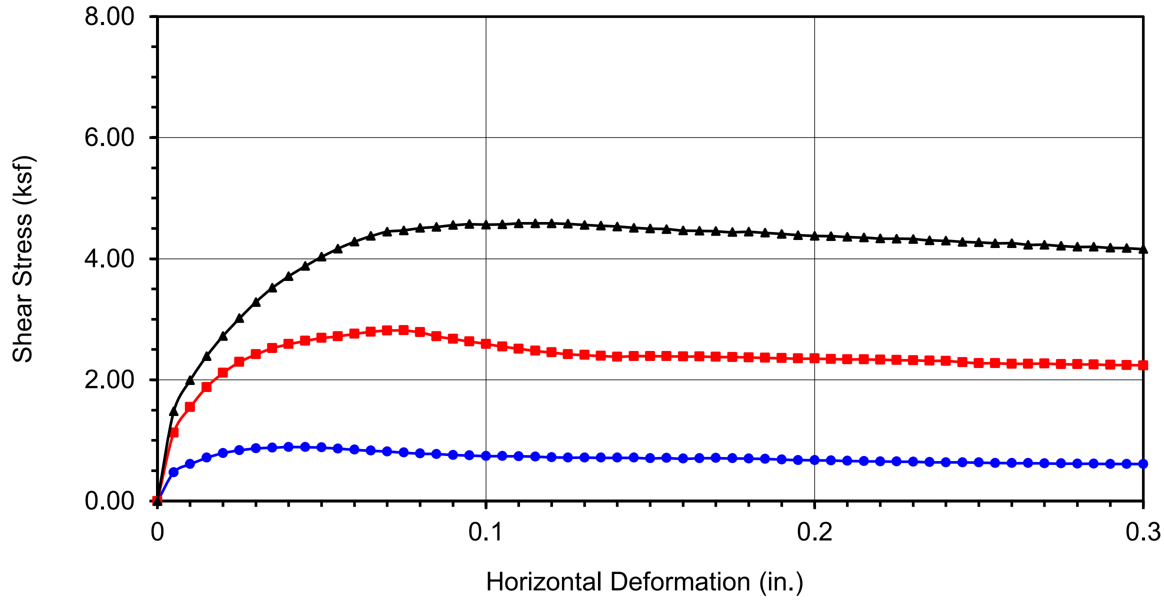
10-23

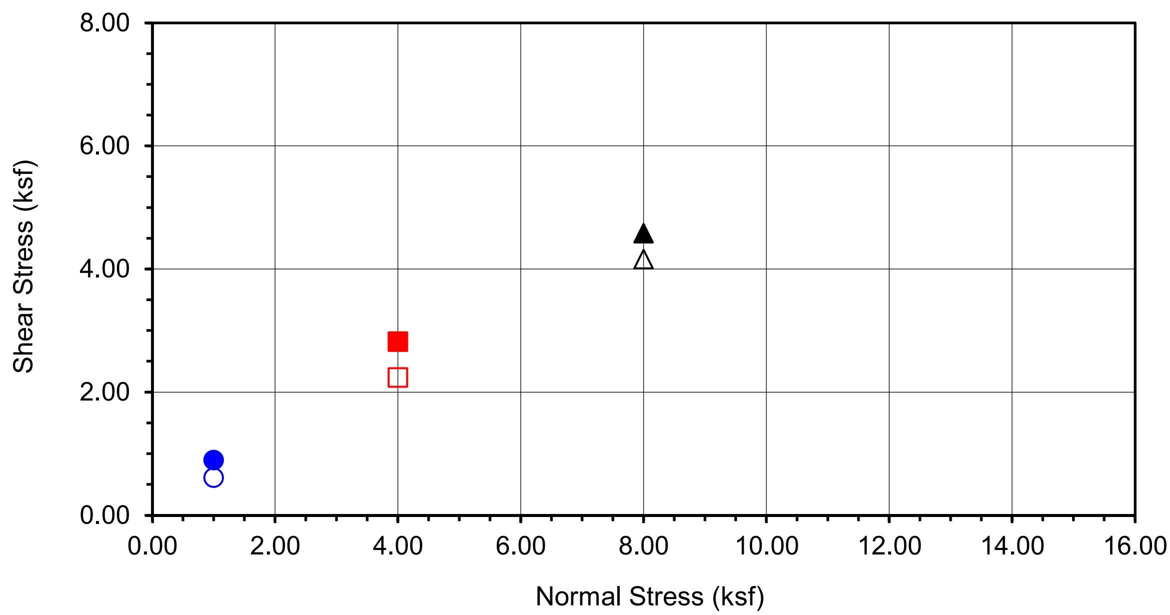
DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name:	Roosevelt TK-K Classroom	Tested By:	G. Bathala	Date:	10/06/23
Project No.:	11428.048	Checked By:	J. Ward	Date:	11/03/23
Boring No.:	LB-1	Sample Type:	Ring		
Sample No.:	R-3	Depth (ft.):	10.0		
Soil Identification:	Dark yellowish brown lean clay (CL)				

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	196.80	203.33	203.91
Weight of Ring(gm):	45.24	45.15	45.33
Before Shearing			
Weight of Wet Sample+Cont.(gm):	230.25	230.25	230.25
Weight of Dry Sample+Cont.(gm):	206.85	206.85	206.85
Weight of Container(gm):	63.20	63.20	63.20
Vertical Rdg.(in): Initial	0.2712	0.2593	0.0000
Vertical Rdg.(in): Final	0.2811	0.2754	-0.0398
After Shearing			
Weight of Wet Sample+Cont.(gm):	220.99	218.34	219.73
Weight of Dry Sample+Cont.(gm):	194.50	193.11	195.04
Weight of Container(gm):	64.15	58.54	60.20
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-1**
Sample No.	**R-3**
Depth (ft)	**10**
Sample Type: Ring	
Soil Identification: Dark yellowish brown lean clay (CL)	

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.893	■ 2.817	▲ 4.584
Shear Stress @ End of Test (ksf)	○ 0.610	□ 2.238	△ 4.159
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	16.29	16.29	16.29
Dry Density (pcf)	108.4	113.1	113.4
Saturation (%)	79.2	89.7	90.4
Soil Height Before Shearing (in.)	0.9901	0.9839	0.9602
Final Moisture Content (%)	20.3	18.7	18.3

Leighton

DIRECT SHEAR TEST RESULTS

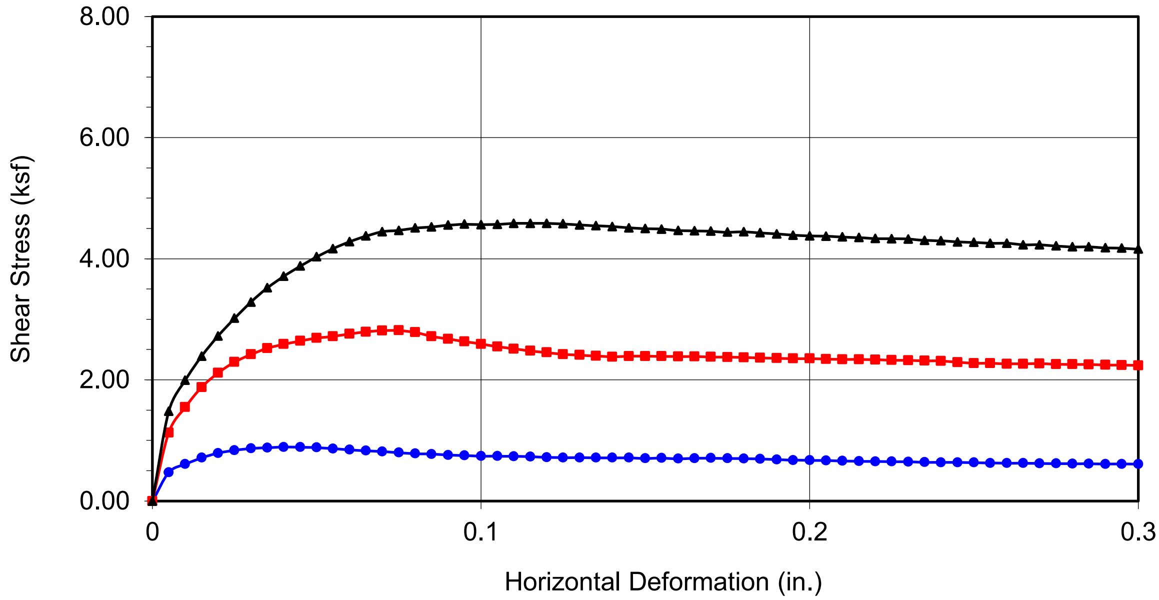
Consolidated Drained - ASTM D 3080

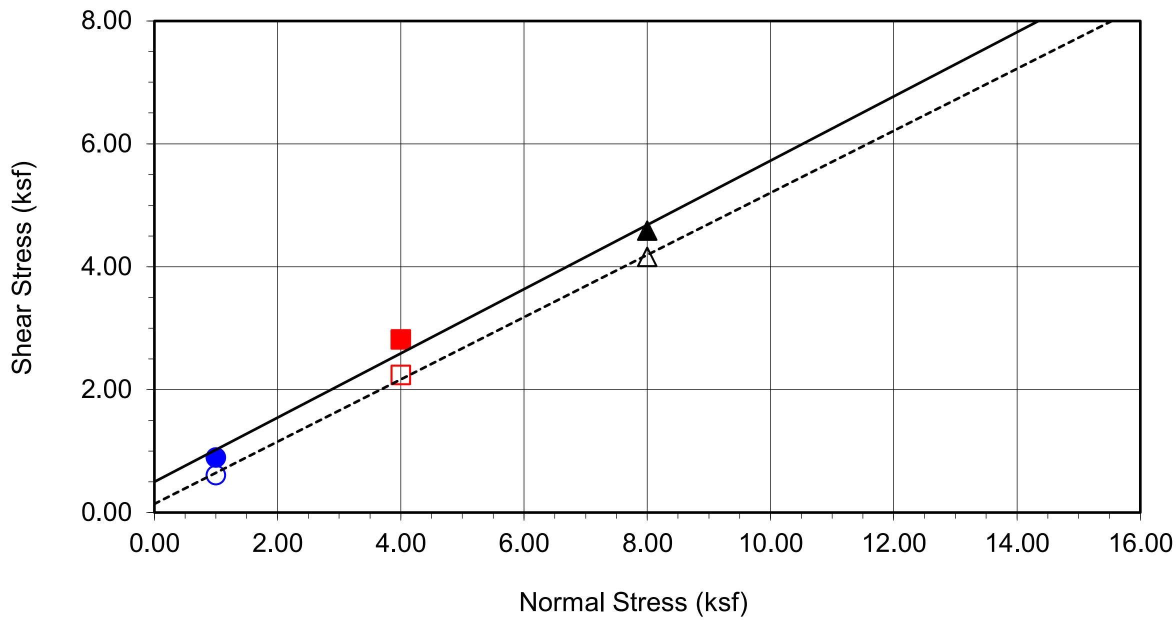
Project No.: 11428.048

Roosevelt TK-K Classroom

10-23

DS LB-1, R-3 @ 10





Boring No.	**LB-1**
Sample No.	**R-3**
Depth (ft)	**10**
Sample Type:	Ring

Soil Identification:
Dark yellowish brown lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	500	28
Ultimate	145	27

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.893	■ 2.817	▲ 4.584
Shear Stress @ End of Test (ksf)	○ 0.610	□ 2.238	△ 4.159
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	16.29	16.29	16.29
Dry Density (pcf)	108.4	113.1	113.4
Saturation (%)	79.2	89.7	90.4
Soil Height Before Shearing (in.)	0.9901	0.9839	0.9602
Final Moisture Content (%)	20.3	18.7	18.3

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

10-23

DIRECT SHEAR TEST

Consolidated Drained - ASTM D 3080

Project Name: Roosevelt TK-K Classroom
Tested By: G. Bathala
Date: 10/14/23

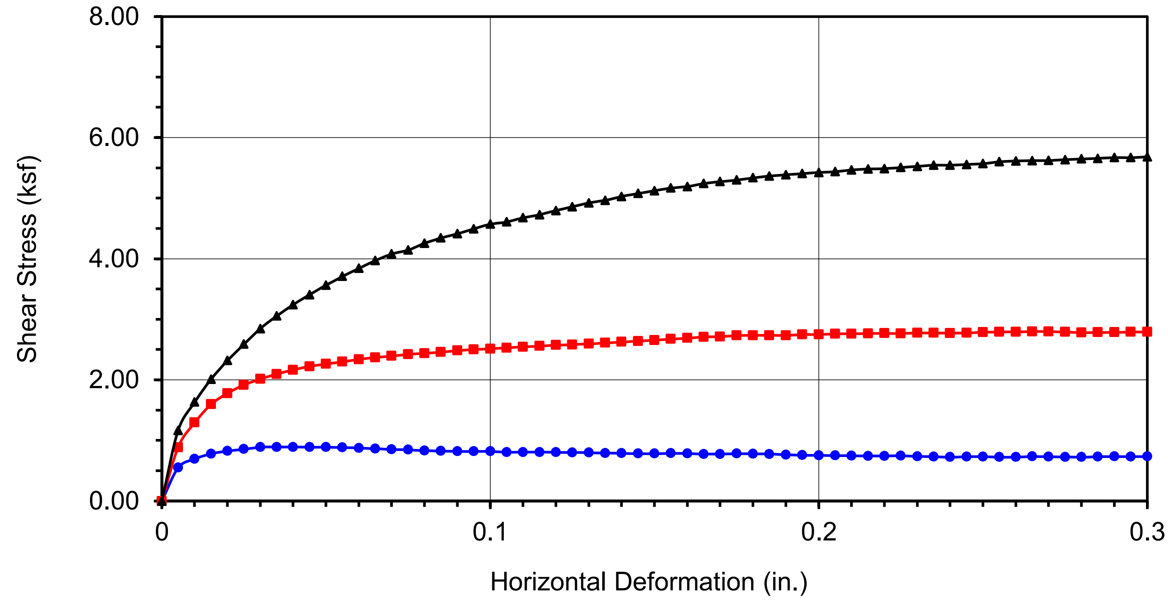
Project No.: 11428.048
Checked By: J. Ward
Date: 11/07/23

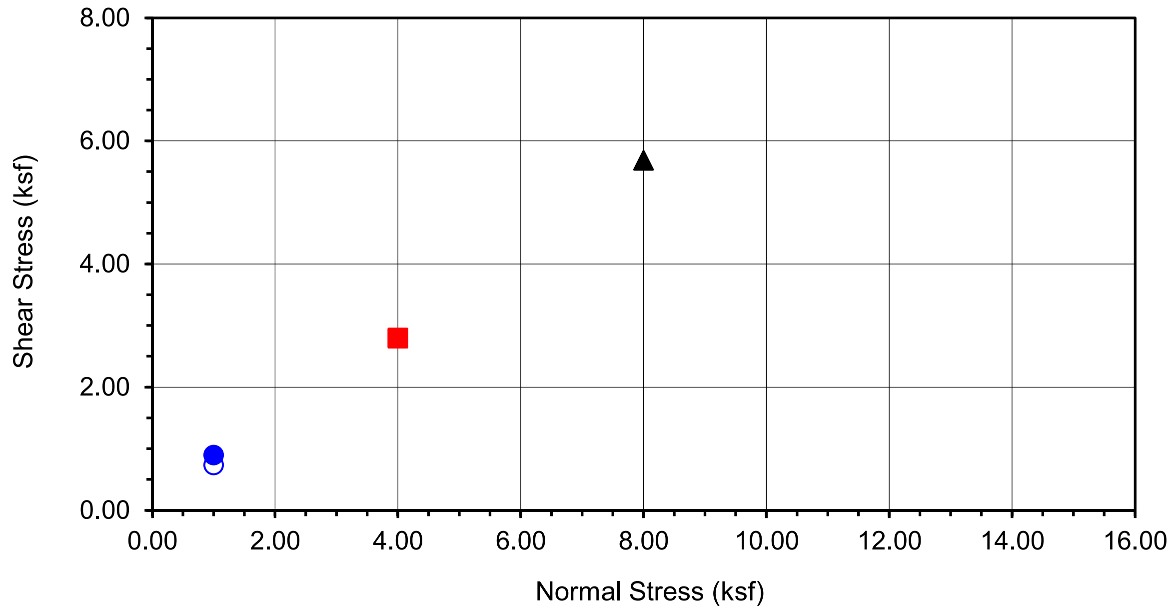
Boring No.: LB-4
Sample Type: 90% Remold

Sample No.: BB-1
Depth (ft.): 0-5

Soil Identification: Dark brown silty, clayey sand with gravel (SC-SM)g

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	199.88	200.81	200.14
Weight of Ring(gm):	44.54	45.33	45.48
Before Shearing			
Weight of Wet Sample+Cont.(gm):	185.48	185.48	185.48
Weight of Dry Sample+Cont.(gm):	175.72	175.72	175.72
Weight of Container(gm):	68.09	68.09	68.09
Vertical Rdg.(in): Initial	0.0000	0.2524	0.2650
Vertical Rdg.(in): Final	-0.0063	0.2647	0.2848
After Shearing			
Weight of Wet Sample+Cont.(gm):	197.68	217.03	192.75
Weight of Dry Sample+Cont.(gm):	177.56	198.63	175.38
Weight of Container(gm):	38.29	58.53	36.53
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-4**
Sample No.	**BB-1**
Depth (ft)	**0-5**

Sample Type:

90% Remold

Soil Identification:
Dark brown silty, clayey sand with gravel (SC-SM)g

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.893	■ 2.798	▲ 5.684
Shear Stress @ End of Test (ksf)	○ 0.736	□ 2.792	△ 5.684
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	9.07	9.07	9.07
Dry Density (pcf)	118.4	118.6	117.9
Saturation (%)	57.9	58.0	57.0
Soil Height Before Shearing (in.)	0.9937	0.9877	0.9802
Final Moisture Content (%)	14.4	13.1	12.5

Leighton

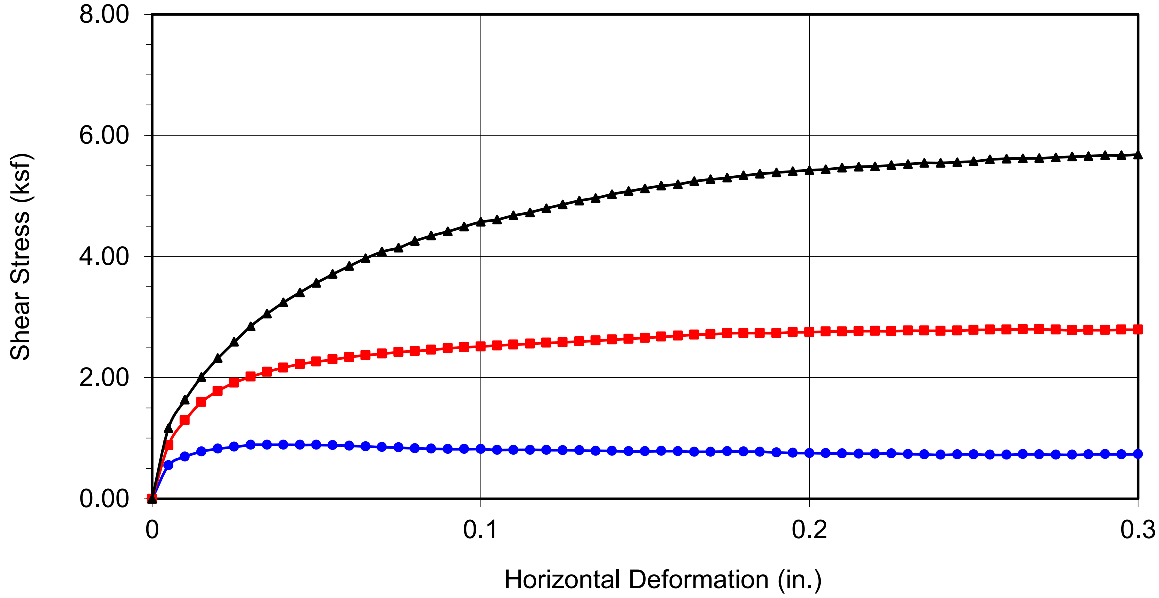
DIRECT SHEAR TEST RESULTS

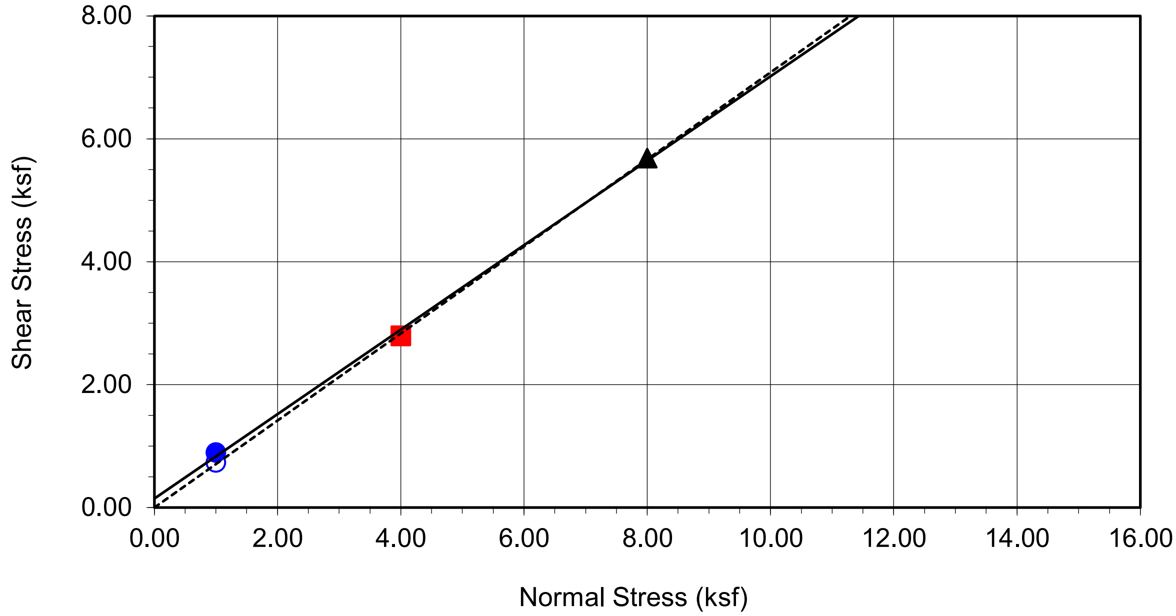
Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

10-23





Boring No.	**LB-4**
Sample No.	**BB-1**
Depth (ft)	**0-5**
Sample Type:	90% Remold
Soil Identification: Dark brown silty, clayey sand with gravel (SC-SM)g	

Strength Parameters

	C (psf)	ϕ (°)
Peak	150	34
Ultimate	4	35

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 0.893	■ 2.798	▲ 5.684
Shear Stress @ End of Test (ksf)	○ 0.736	□ 2.792	△ 5.684
Deformation Rate (in./min.)	0.0025	0.0025	0.0025
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	9.07	9.07	9.07
Dry Density (pcf)	118.4	118.6	117.9
Saturation (%)	57.9	58.0	57.0
Soil Height Before Shearing (in.)	0.9937	0.9877	0.9802
Final Moisture Content (%)	14.4	13.1	12.5

Leighton

DIRECT SHEAR TEST RESULTS

Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

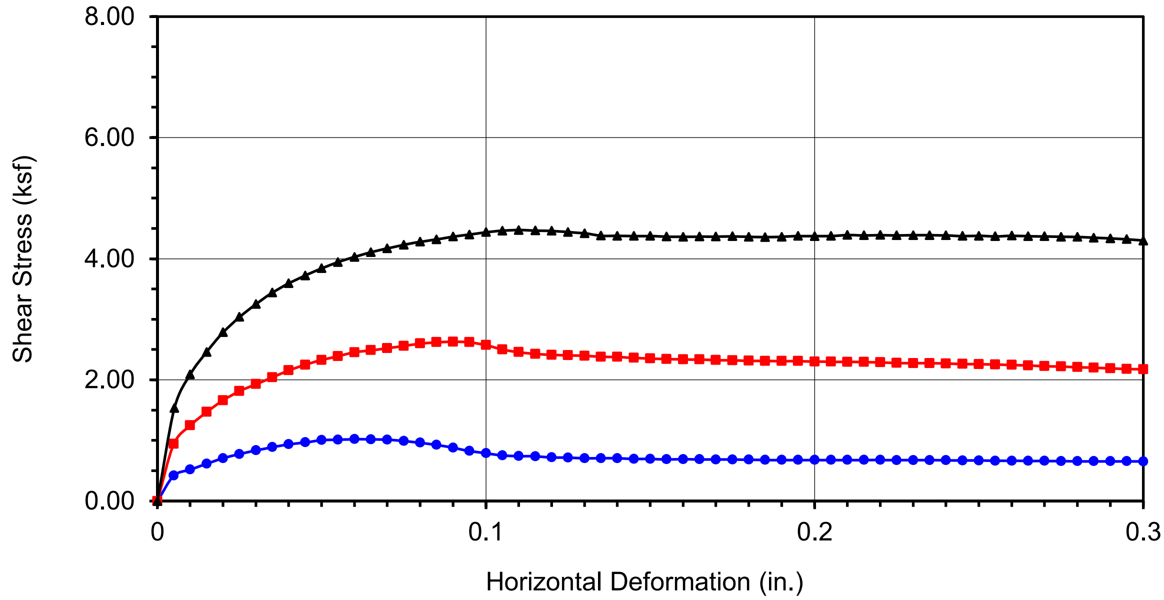
10-23

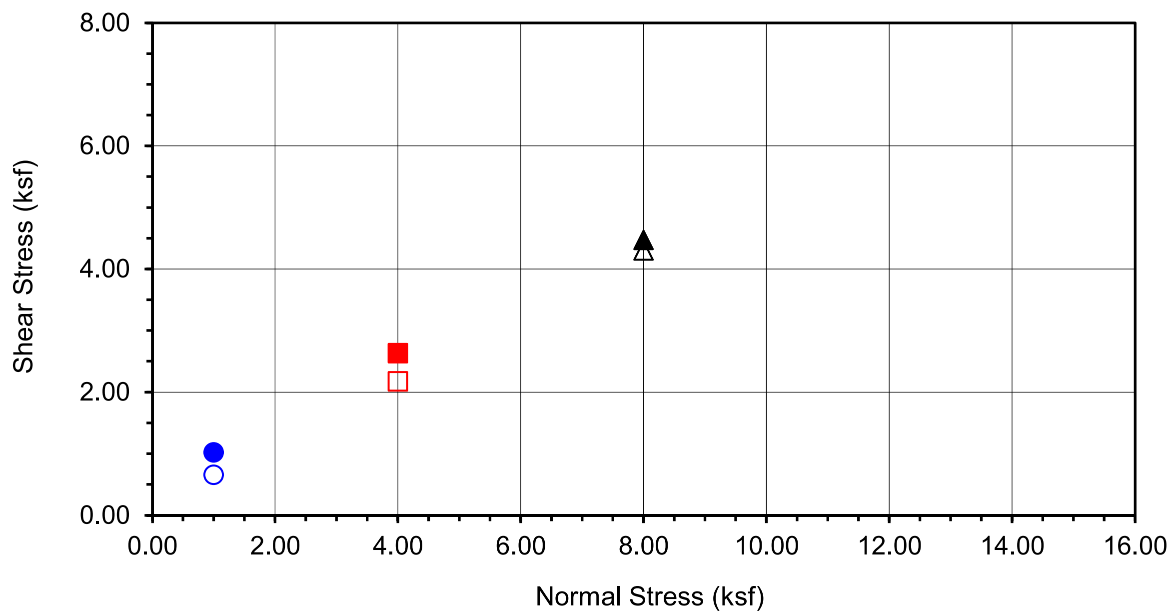
DIRECT SHEAR TEST
Consolidated Drained - ASTM D 3080

Project Name:	Roosevelt TK-K Classroom	Tested By:	G. Bathala	Date:	10/09/23
Project No.:	11428.048	Checked By:	J. Ward	Date:	11/03/23
Boring No.:	LB-4	Sample Type:	Ring		
Sample No.:	R-2	Depth (ft.):	7.0		

Soil Identification: Dark yellowish brown lean clay (CL)

Sample Diameter(in):	2.415	2.415	2.415
Sample Thickness(in.):	1.000	1.000	1.000
Weight of Sample + ring(gm):	197.74	195.76	199.48
Weight of Ring(gm):	44.95	41.63	41.13
Before Shearing			
Weight of Wet Sample+Cont.(gm):	199.13	199.13	199.13
Weight of Dry Sample+Cont.(gm):	174.63	174.63	174.63
Weight of Container(gm):	56.84	56.84	56.84
Vertical Rdg.(in): Initial	0.0000	0.2630	0.2673
Vertical Rdg.(in): Final	-0.0136	0.2983	0.3024
After Shearing			
Weight of Wet Sample+Cont.(gm):	208.21	216.87	213.93
Weight of Dry Sample+Cont.(gm):	180.30	190.47	187.72
Weight of Container(gm):	55.14	64.01	57.85
Specific Gravity (Assumed):	2.70	2.70	2.70
Water Density(pcf):	62.43	62.43	62.43





Boring No.	**LB-4**
Sample No.	**R-2**
Depth (ft)	**7**

<u>Sample Type:</u>

Ring

<u>Soil Identification:</u>
Dark yellowish brown lean clay (CL)

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.022	■ 2.631	▲ 4.474
Shear Stress @ End of Test (ksf)	○ 0.654	□ 2.175	△ 4.301
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	20.80	20.80	20.80
Dry Density (pcf)	105.2	106.1	109.0
Saturation (%)	93.2	95.4	102.8
Soil Height Before Shearing (in.)	0.9864	0.9647	0.9649
Final Moisture Content (%)	22.3	20.9	20.2

Leighton

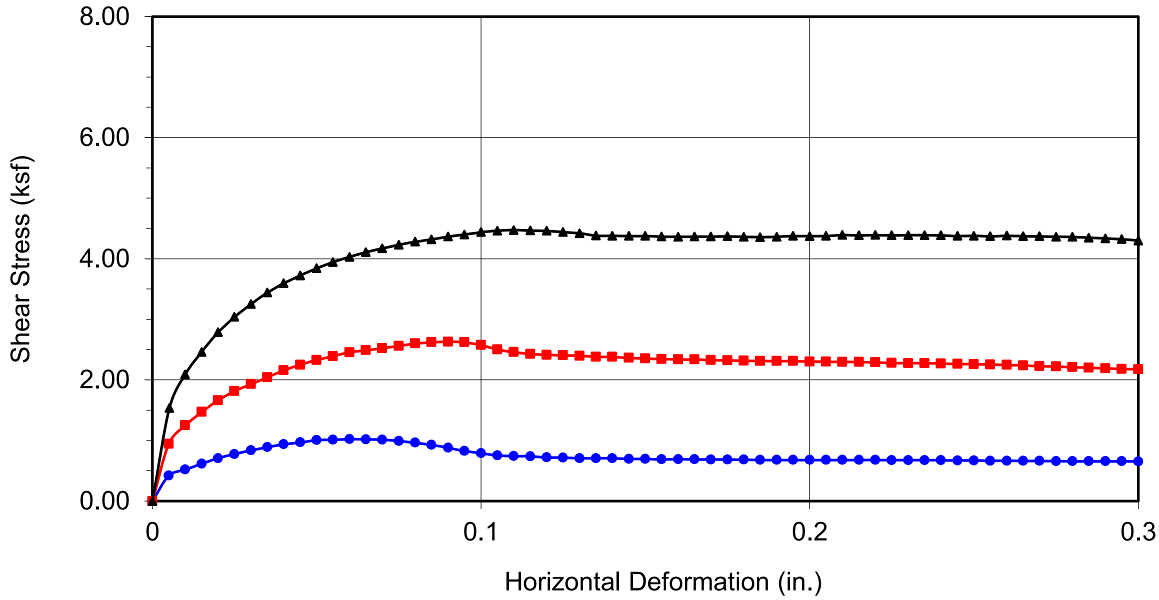
DIRECT SHEAR TEST RESULTS

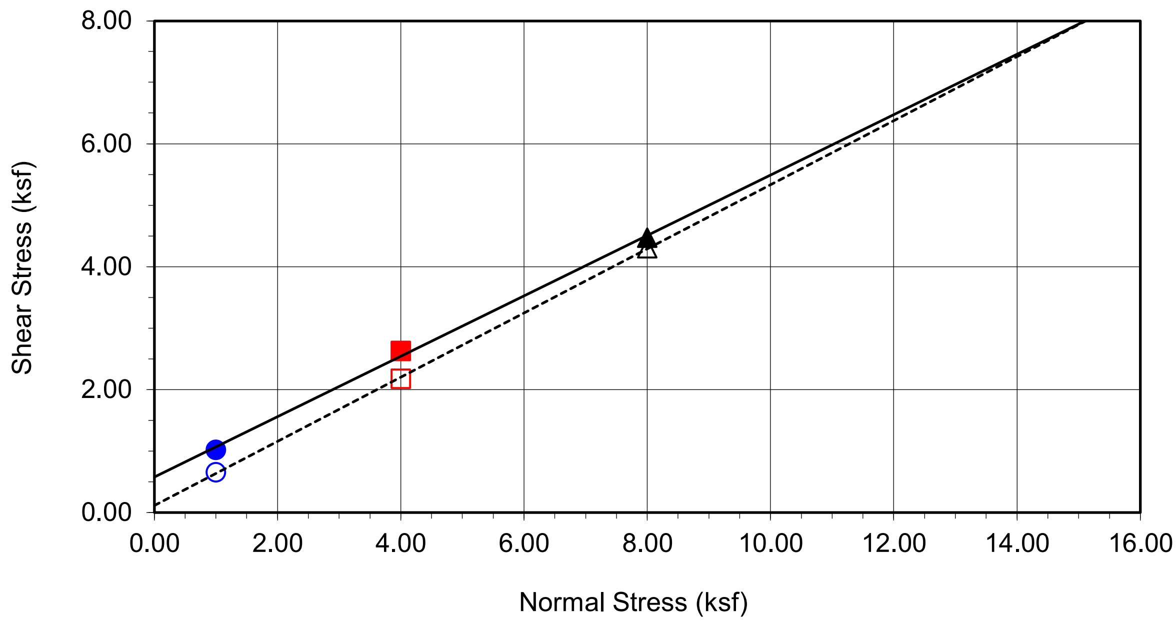
Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

10-23





Boring No.	**LB-4**
Sample No.	**R-2**
Depth (ft)	**7**
Sample Type:	Ring

Soil Identification:
Dark yellowish brown lean clay (CL)

Strength Parameters

	C (psf)	ϕ (°)
Peak	580	26
Ultimate	117	28

Normal Stress (kip/ft²)	1.000	4.000	8.000
Peak Shear Stress (kip/ft²)	● 1.022	■ 2.631	▲ 4.474
Shear Stress @ End of Test (ksf)	○ 0.654	□ 2.175	△ 4.301
Deformation Rate (in./min.)	0.0017	0.0017	0.0017
Initial Sample Height (in.)	1.000	1.000	1.000
Diameter (in.)	2.415	2.415	2.415
Initial Moisture Content (%)	20.80	20.80	20.80
Dry Density (pcf)	105.2	106.1	109.0
Saturation (%)	93.2	95.4	102.8
Soil Height Before Shearing (in.)	0.9864	0.9647	0.9649
Final Moisture Content (%)	22.3	20.9	20.2

Leighton

DIRECT SHEAR TEST RESULTS
Consolidated Drained - ASTM D 3080

Project No.: 11428.048

Roosevelt TK-K Classroom

10-23

EXPANSION INDEX of SOILS
ASTM D 4829

Project Name:	Roosevelt TK-K Classroom	Tested By:	G. Berdy	Date:	10/13/23
Project No.:	11428.048	Checked By:	J. Ward	Date:	11/06/23
Boring No.:	LB-1	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Dark yellowish brown clayey sand (SC)				

Dry Wt. of Soil + Cont. (g)	1000.00
Wt. of Container No. (g)	0.00
Dry Wt. of Soil (g)	1000.00
Weight Soil Retained on #4 Sieve	0.00
Percent Passing # 4	100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0175
Wt. Comp. Soil + Mold (g)	589.10	440.91
Wt. of Mold (g)	180.50	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	819.60	621.41
Dry Wt. of Soil + Cont. (g)	751.90	555.33
Wt. of Container (g)	0.00	180.50
Moisture Content (%)	9.00	17.63
Wet Density (pcf)	123.3	130.7
Dry Density (pcf)	113.1	111.1
Void Ratio	0.491	0.517
Total Porosity	0.329	0.341
Pore Volume (cc)	68.2	71.8
Degree of Saturation (%) [S_{meas}]	**49.5**	92.0

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
10/13/23	10:38	1.0	0	0.4740
10/13/23	10:48	1.0	10	0.4735
Add Distilled Water to the Specimen				
10/13/23	11:44	1.0	56	0.4788
10/14/23	6:17	1.0	1169	0.4915
10/14/23	7:30	1.0	1242	0.4915

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**18**

EXPANSION INDEX of SOILS
ASTM D 4829

Project Name:	Roosevelt TK-K Classroom	Tested By:	G. Berdy	Date:	10/16/23
Project No.:	11428.048	Checked By:	J. Ward	Date:	11/07/23
Boring No.:	LB-4	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Dark brown silty, clayey sand with gravel (SC-SM)g				

Dry Wt. of Soil + Cont. (g)	1000.00
Wt. of Container No. (g)	0.00
Dry Wt. of Soil (g)	1000.00
Weight Soil Retained on #4 Sieve	0.00
Percent Passing # 4	100.00

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	0.9945
Wt. Comp. Soil + Mold (g)	636.00	448.28
Wt. of Mold (g)	208.20	0.00
Specific Gravity (Assumed)	2.70	2.70
Container No.	O	O
Wet Wt. of Soil + Cont. (g)	847.50	656.48
Dry Wt. of Soil + Cont. (g)	786.20	605.08
Wt. of Container (g)	0.00	208.20
Moisture Content (%)	7.80	12.95
Wet Density (pcf)	129.0	136.0
Dry Density (pcf)	119.7	120.4
Void Ratio	0.408	0.400
Total Porosity	0.290	0.286
Pore Volume (cc)	60.0	58.9
Degree of Saturation (%) [S_{meas}]	**51.6**	87.3

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
10/16/23	8:22	1.0	0	0.5005
10/16/23	8:32	1.0	10	0.5000
Add Distilled Water to the Specimen				
10/16/23	9:37	1.0	65	0.4950
10/17/23	5:59	1.0	1287	0.4950
10/17/23	8:05	1.0	1413	0.4950

Expansion Index (EI_{meas}) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	**0**

MODIFIED PROCTOR COMPACTION TEST
ASTM D 1557

Project Name:	Roosevelt TK-K Classroom	Tested By:	A. Santos	Date:	10/12/23
Project No.:	11428.048	Checked By:	G. Bathala	Date:	10/13/23
Boring No.:	LB-1	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Dark yellowish brown clayey sand (SC)				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

			Scalp Fraction (%)			
Preparation Method:	X	Moist			Rammer Weight (lb.) =	10.0
		Dry	#3/4		Height of Drop (in.) =	18.0
Compaction Method	X	Mechanical Ram	#3/8			
		Manual Ram	#4	12.0	Mold Volume (ft³)	0.03320

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3828	3933	3837			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	2020	2125	2029			
Wet Weight of Soil + Cont. (g)	1140.2	885.5	942.0			
Dry Weight of Soil + Cont. (g)	1053.1	803.4	836.4			
Weight of Container (g)	76.8	88.9	89.1			
Moisture Content (%)	8.92	11.50	14.13			
Wet Density (pcf)	134.1	141.1	134.7			
Dry Density (pcf)	123.1	126.6	118.1			

Maximum Dry Density (pcf)	**126.8**	**Optimum Moisture Content (%)**	**11.0**
Corrected Dry Density (pcf)	**130.7**	**Corrected Moisture Content (%)**	**9.8**

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

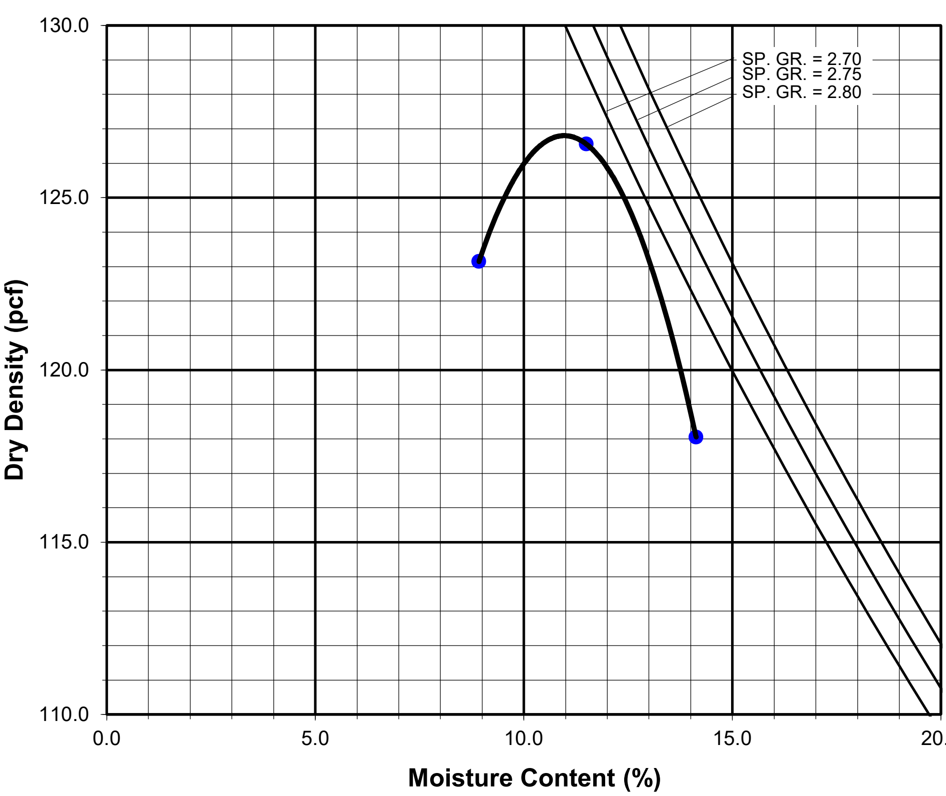
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Leighton

Project Name:	Roosevelt TK-K Classroom	Tested By:	A. Santos	Date:	10/12/23
Project No.:	11428.048	Checked By:	G. Bathala	Date:	10/13/23
Boring No.:	LB-4	Depth (ft.):	0-5		
Sample No.:	BB-1				
Soil Identification:	Dark brown silty, clayey sand with gravel (SC-SM)g				

Note: Corrected dry density calculation assumes specific gravity of 2.70 and moisture content of 1.0% for oversize particles

Preparation Method:	X	Moist	Scalp Fraction (%)		Rammer Weight (lb.) =	10.0
		Dry	#3/4		Height of Drop (in.) =	18.0
Compaction Method	X	Mechanical Ram	#3/8			
		Manual Ram	#4	25.8	Mold Volume (ft³)	0.03320

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	3812	3959	3925			
Weight of Mold (g)	1808	1808	1808			
Net Weight of Soil (g)	2004	2151	2117			
Wet Weight of Soil + Cont. (g)	1035.4	821.3	814.8			
Dry Weight of Soil + Cont. (g)	976.3	759.5	739.0			
Weight of Container (g)	88.5	88.0	72.5			
Moisture Content (%)	6.66	9.20	11.37			
Wet Density (pcf)	133.1	142.8	140.6			
Dry Density (pcf)	124.8	130.8	126.2			

Maximum Dry Density (pcf)	**130.8**	**Optimum Moisture Content (%)**	**9.2**
Corrected Dry Density (pcf)	**138.8**	**Corrected Moisture Content (%)**	**7.1**

[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

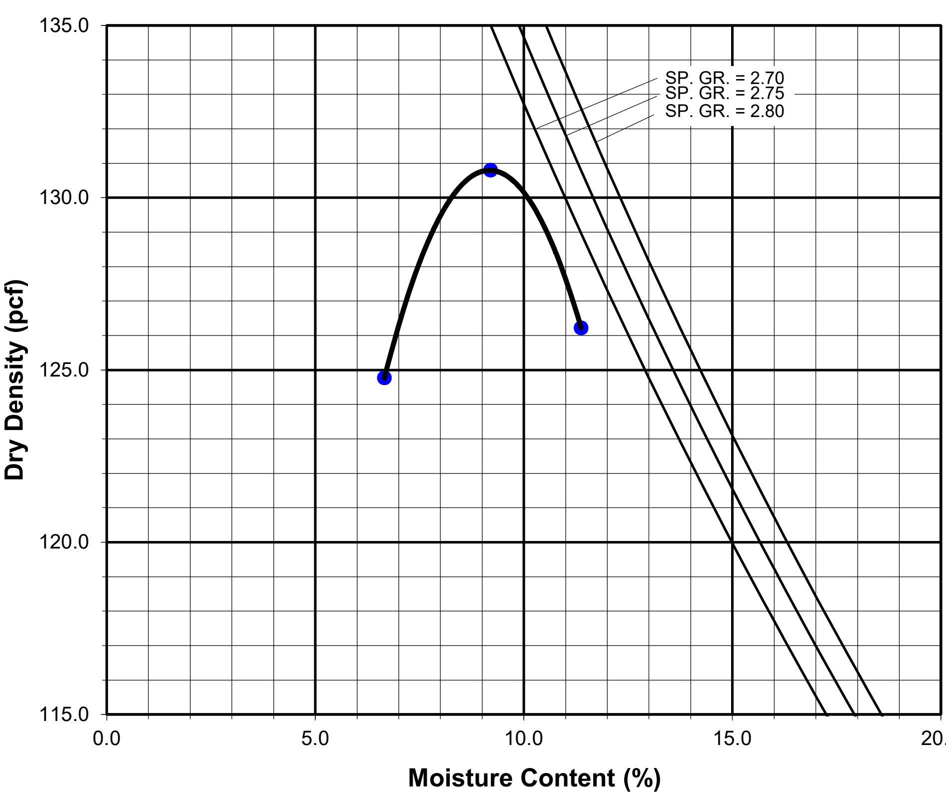
[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:

GR:SA:FI

Atterberg Limits:

LL,PL,PI



ATTERBERG LIMITS
ASTM D 4318

Leighton

Project Name:	Roosevelt TK-K Classroom	Tested By:	J. Domingo	Date:	10/13/23
Project No. :	11428.048	Input By:	JD/JHW	Date:	10/16/23
Boring No.:	LB-1	Checked By:	J. Ward		
Sample No.:	R-2	Depth (ft.)	7.0		
Soil Identification:	Brown lean clay (CL)				

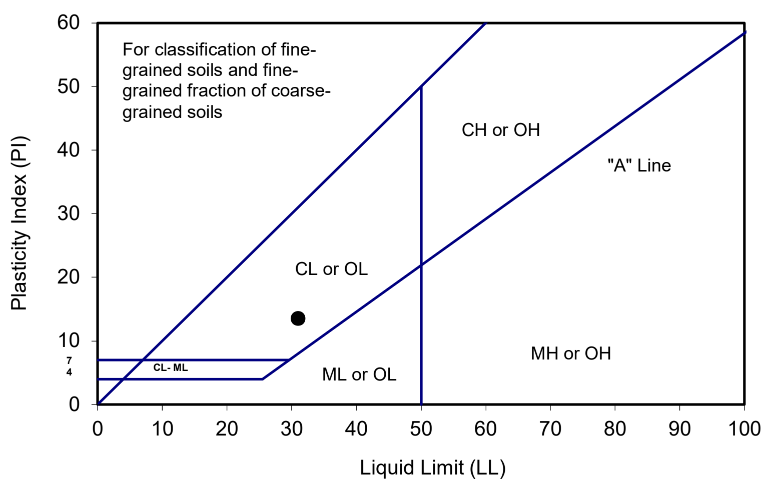
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			30	23	16	
Wet Wt. of Soil + Cont. (g)	9.31	9.25	21.48	22.92	21.76	
Dry Wt. of Soil + Cont. (g)	8.05	8.07	16.72	17.75	16.81	
Wt. of Container (g)	1.10	1.06	1.10	1.16	1.10	
Moisture Content (%) [Wn]	18.13	16.83	30.47	31.16	31.51	

Liquid Limit	**31**
Plastic Limit	**17**
Plasticity Index	**14**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) | 8.03

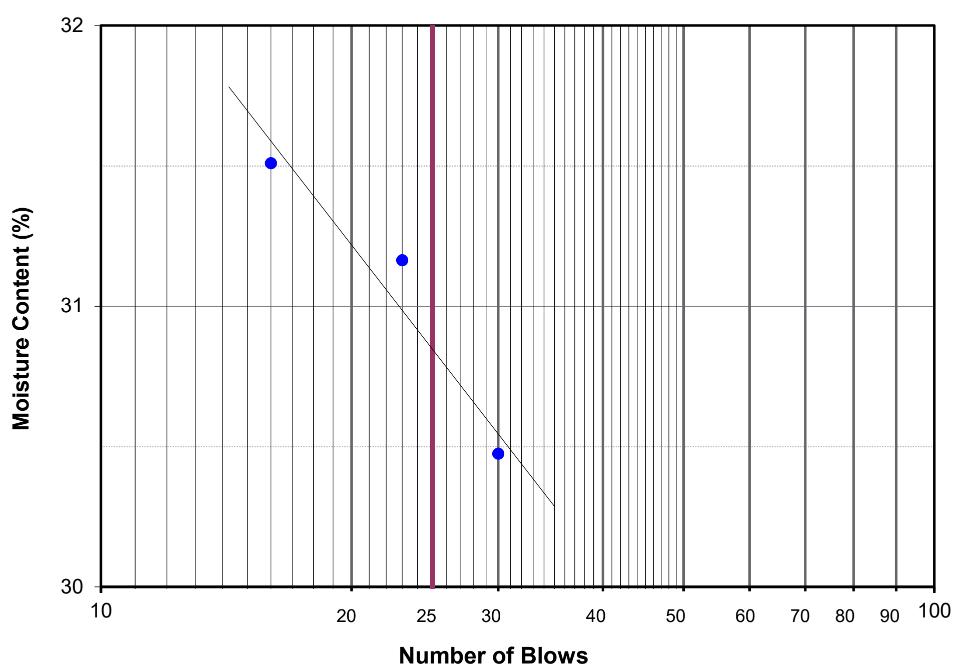
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [X] Dry Preparation
  Multipoint - Dry
- [X] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



ATTERBERG LIMITS
ASTM D 4318

Project Name:	Roosevelt TK-K Classroom	Tested By:	J. Domingo	Date:	10/13/23
Project No. :	11428.048	Input By:	JD/JHW	Date:	10/16/23
Boring No.:	LB-2	Checked By:	J. Ward		
Sample No.:	R-1	Depth (ft.)	5.0		
Soil Identification:	Brown lean clay (CL)				

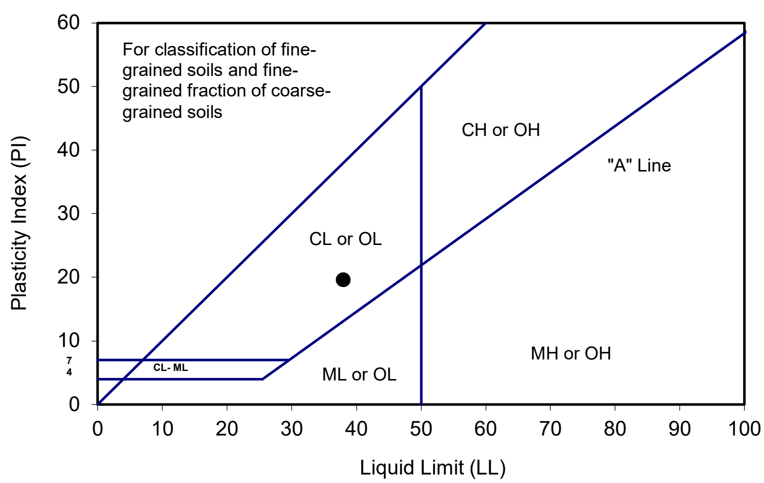
TEST	PLASTIC LIMIT		LIQUID LIMIT			
NO.	1	2	1	2	3	4
Number of Blows [N]			30	25	20	
Wet Wt. of Soil + Cont. (g)	9.71	9.55	21.03	19.19	19.75	
Dry Wt. of Soil + Cont. (g)	8.37	8.22	15.63	14.18	14.40	
Wt. of Container (g)	1.11	0.99	1.06	1.11	1.03	
Moisture Content (%) [Wn]	18.46	18.40	37.06	38.33	40.01	

Liquid Limit	**38**
Plastic Limit	**18**
Plasticity Index	**20**
Classification	**CL**

PI at "A" - Line = 0.73(LL-20) 13.14

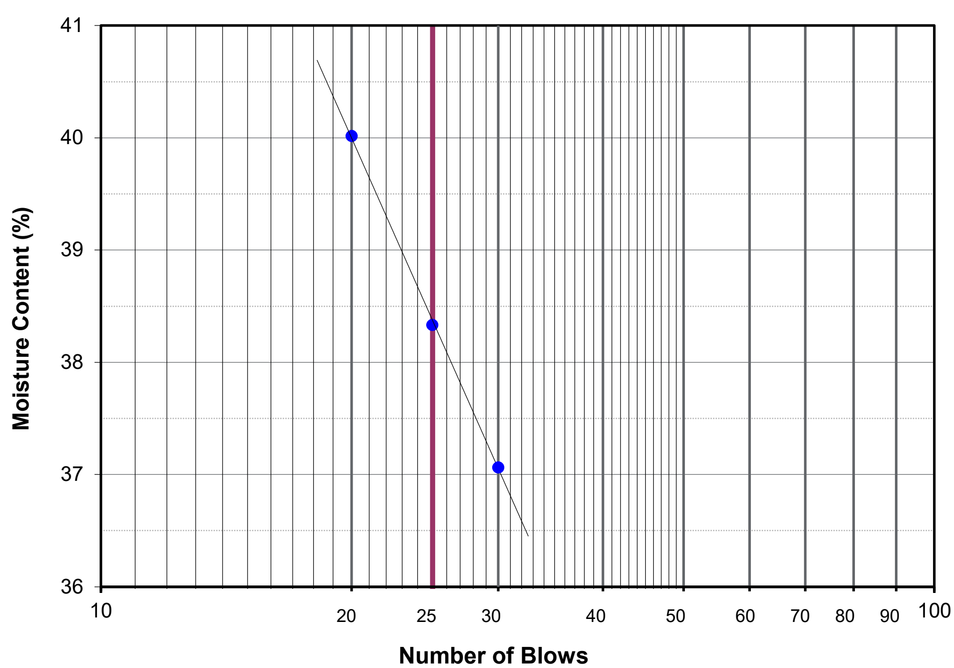
One - Point Liquid Limit Calculation

$LL = Wn(N/25)^{0.121}$



PROCEDURES USED

- [ ] Wet Preparation
  Multipoint - Wet
- [x] Dry Preparation
  Multipoint - Dry
- [x] Procedure A
  Multipoint Test
- [ ] Procedure B
  One-point Test



Leighton

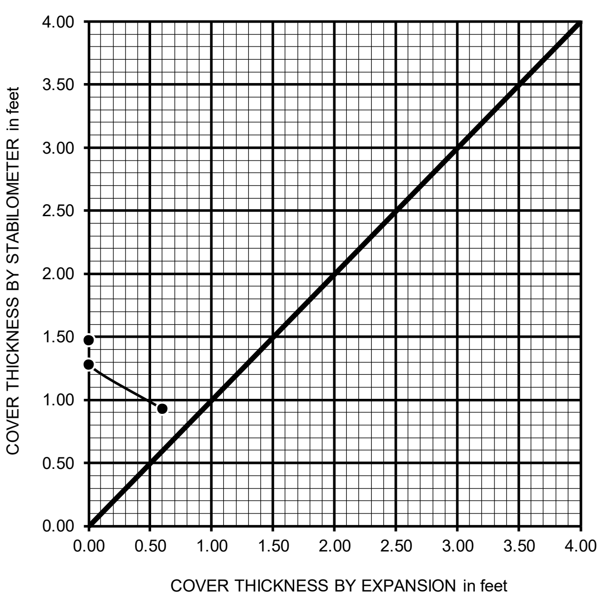
R-VALUE TEST RESULTS
DOT CA Test 301

PROJECT NAME:	Roosevelt TK-K Classroom	PROJECT NUMBER:	11428.048
BORING NUMBER:	LB-1	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	O. Figueroa
SAMPLE DESCRIPTION:	Dark yellowish brown clayey sand (SC)	DATE COMPLETED:	10/10/2023

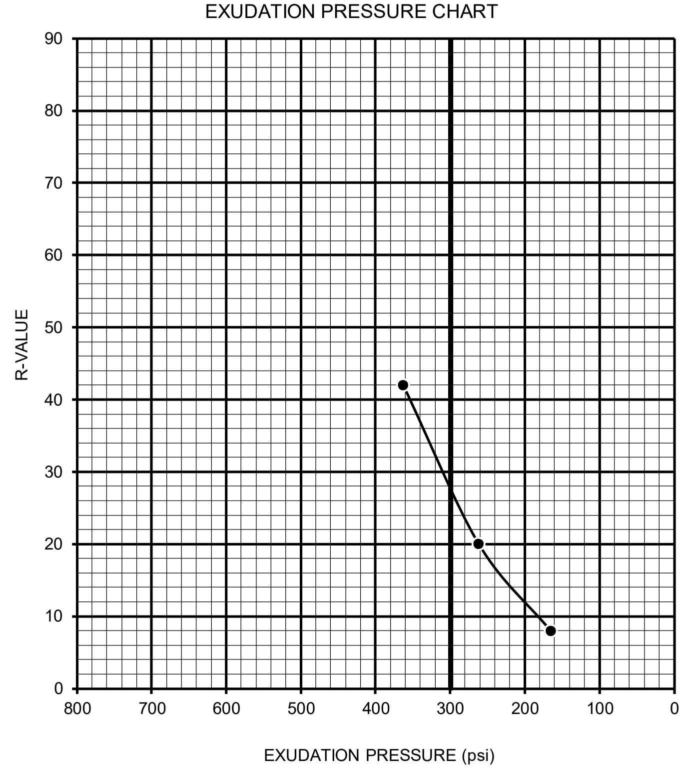
TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	12.3	13.4	14.6
HEIGHT OF SAMPLE, Inches	2.42	2.52	2.55
DRY DENSITY, pcf	123.8	122.6	119.8
COMPACTOR PRESSURE, psi	130	80	50
EXUDATION PRESSURE, psi	363	262	165
EXPANSION, Inches x 10exp-4	18	0	0
STABILITY Ph 2,000 lbs (160 psi)	68	110	138
TURNS DISPLACEMENT	4.30	4.48	4.58
R-VALUE UNCORRECTED	44	20	8
R-VALUE CORRECTED	42	20	8

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.93	1.28	1.47
EXPANSION PRESSURE THICKNESS, ft.	0.60	0.00	0.00

EXPANSION PRESSURE CHART



EXUDATION PRESSURE CHART



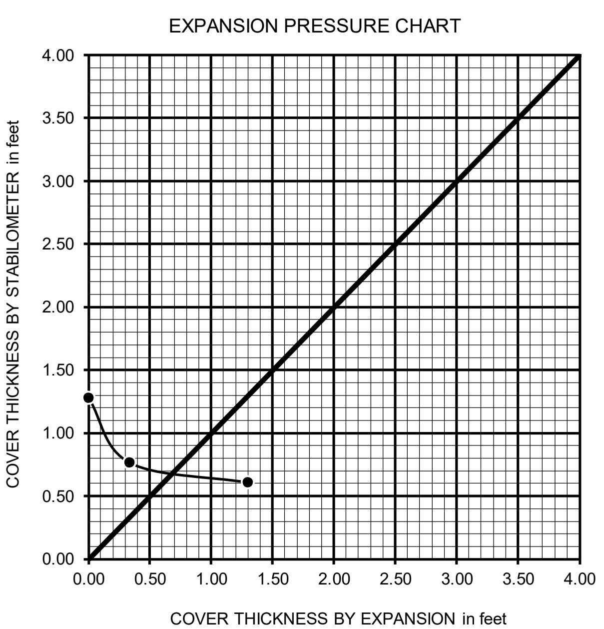
R-VALUE BY EXPANSION:	49
R-VALUE BY EXUDATION:	27
EQUILIBRIUM R-VALUE:	27

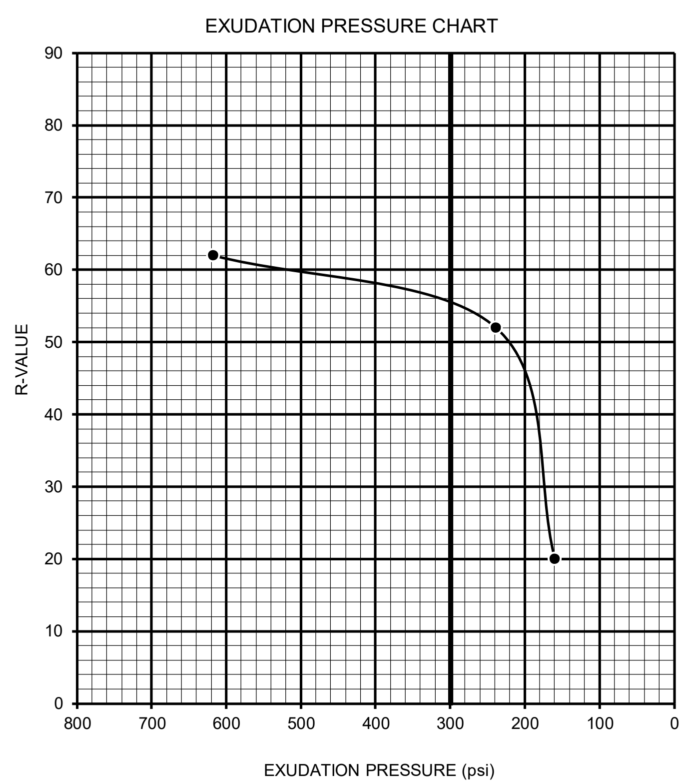
R-VALUE TEST RESULTS
DOT CA Test 301

PROJECT NAME:	Roosevelt TK-K Classroom	PROJECT NUMBER:	11428.048
BORING NUMBER:	LB-4	DEPTH (FT.):	0-5
SAMPLE NUMBER:	B-1	TECHNICIAN:	O. Figueroa
SAMPLE DESCRIPTION:	Dark brown silty, clayey sand with gravel (SC-SM)g	DATE COMPLETED:	10/17/2023

TEST SPECIMEN	a	b	c
MOISTURE AT COMPACTION %	9.3	10.2	11.4
HEIGHT OF SAMPLE, Inches	2.42	2.44	2.50
DRY DENSITY, pcf	129.8	128.7	127.8
COMPACTOR PRESSURE, psi	250	170	60
EXUDATION PRESSURE, psi	618	239	160
EXPANSION, Inches x 10exp-4	39	10	0
STABILITY Ph 2,000 lbs (160 psi)	40	53	110
TURNS DISPLACEMENT	4.20	4.35	4.60
R-VALUE UNCORRECTED	64	54	20
R-VALUE CORRECTED	62	52	20

DESIGN CALCULATION DATA	a	b	c
GRAVEL EQUIVALENT FACTOR	1.0	1.0	1.0
TRAFFIC INDEX	5.0	5.0	5.0
STABILOMETER THICKNESS, ft.	0.61	0.77	1.28
EXPANSION PRESSURE THICKNESS, ft.	1.30	0.33	0.00





R-VALUE BY EXPANSION:	57
R-VALUE BY EXUDATION:	55
EQUILIBRIUM R-VALUE:	55

APPENDIX C

Seismicity Data

Leighton
a verdantas company

Roosevelt ES

Latitude, Longitude: 34.0283, -118.5006

Date	11/28/2023, 9:46:35 AM
Design Code Reference Document	NEHRP-2015
Risk Category	IV
Site Class	D - Stiff Soil

Type	Value	Description
S_S	1.943	MCE_R ground motion. (for 0.2 second period)
S_1	0.694	MCE_R ground motion. (for 1.0s period)
S_{MS}	1.943	Site-modified spectral acceleration value
S_{M1}	1.18 -See Section 11.4.7	Site-modified spectral acceleration value
S_{DS}	1.295	Numeric seismic design value at 0.2 second SA
S_{D1}	0.787 -See Section 11.4.7	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	D -See Section 11.4.7	Seismic design category
F_a	1	Site amplification factor at 0.2 second
F_v	1.7 -See Section 11.4.7	Site amplification factor at 1.0 second
PGA	0.83	MCE_G peak ground acceleration
F_{PGA}	1.1	Site amplification factor at PGA
PGA_M	0.913	Site modified peak ground acceleration
T_L	8	Long-period transition period in seconds
SsRT	1.943	Probabilistic risk-targeted ground motion. (0.2 second)
SsUH	2.139	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
SsD	2.44	Factored deterministic acceleration value. (0.2 second)
S1RT	0.694	Probabilistic risk-targeted ground motion. (1.0 second)
S1UH	0.768	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S1D	0.827	Factored deterministic acceleration value. (1.0 second)
PGAd	0.989	Factored deterministic acceleration value. (Peak Ground Acceleration)

Type	Value	Description
PGA_{UH}	0.83	Uniform-hazard (2% probability of exceedance in 50 years) Peak Ground Acceleration
C_{RS}	0.908	Mapped value of the risk coefficient at short periods
C_{R1}	0.904	Mapped value of the risk coefficient at a period of 1 s
C_V	1.489	Vertical coefficient

DISCLAIMER

While the information presented on this website is believed to be correct, SEAOC /OSHPD and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in this web application should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. SEAOC / OSHPD do not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the seismic data provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the search results of this website.

```
          ************************
          *                      *
          *    E Q S E A R C H   *
          *                      *
          *     Version 3.00     *
          *                      *
          ************************
```

ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 11428.048

DATE: 11-22-2023

JOB NAME: Roosevelt ES

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
   MINIMUM MAGNITUDE: 4.00
   MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
   SITE LATITUDE: 34.0283
   SITE LONGITUDE: 118.5006

SEARCH DATES:
   START DATE: 1800
   END DATE: 2018

SEARCH RADIUS:
   100.0 mi
   160.9 km

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
   UNCERTAINTY (M=Median, S=Sigma): M   Number of Sigmas: 0.0
   ASSUMED SOURCE TYPE: DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
   SCOND: 0 Depth Source: A
   Basement Depth: 5.00 km   Campbell SSR: 0   Campbell SHR: 0
   COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 3.0

EARTHQUAKE SEARCH RESULTS

Page 1

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	34.0000	118.5000	11/08/1914	1140 0.0	0.0	4.50	0.164	VIII	1.9(3.1)
DMG	34.0000	118.5000	08/04/1927	1224 0.0	0.0	5.00	0.231	IX	1.9(3.1)
DMG	34.0000	118.5000	06/22/1920	248 0.0	0.0	4.90	0.216	VIII	1.9(3.1)
MGI	34.0000	118.5000	03/08/1918	1230 0.0	0.0	4.00	0.113	VII	1.9(3.1)
MGI	34.0000	118.5000	06/23/1920	1220 0.0	0.0	4.00	0.113	VII	1.9(3.1)
MGI	34.0000	118.5000	11/19/1918	2018 0.0	0.0	5.00	0.231	IX	1.9(3.1)
DMG	34.0000	118.5000	03/06/1918	1820 0.0	0.0	4.00	0.113	VII	1.9(3.1)
GSP	34.0958	118.4912	06/02/2014	023643.9	4.3	4.16	0.087	VII	4.7(7.5)
DMG	34.0000	118.4170	12/07/1938	338 0.0	0.0	4.00	0.072	VI	5.2(8.3)
MGI	34.0000	118.4000	02/07/1927	429 0.0	0.0	4.60	0.099	VII	6.1(9.8)
MGI	34.0000	118.4000	02/22/1920	1610 0.0	0.0	4.60	0.099	VII	6.1(9.8)
MGI	34.0000	118.4000	01/29/1927	2324 0.0	0.0	4.00	0.062	VI	6.1(9.8)
MGI	34.0000	118.4000	10/01/1930	040 0.0	0.0	4.60	0.099	VII	6.1(9.8)
GSP	34.0590	118.3870	09/09/2001	235918.0	4.0	4.20	0.065	VI	6.8(11.0)
GSP	34.1340	118.4862	03/17/2014	132536.9	9.2	4.39	0.071	VI	7.3(11.8)
DMG	33.9500	118.6320	08/31/1930	04036.0	0.0	5.20	0.105	VII	9.3(14.9)
DMG	33.9030	118.4310	11/29/1938	192115.8	10.0	4.00	0.039	V	9.5(15.3)

PAS	33.9190	118.6270	01/19/1989	65328.8	11.9	5.00	0.077	VII	10.5(16.8)
GSP	33.9380	118.3360	05/18/2009	033936.3	13.0	4.70	0.056	VI	11.3(18.2)
MGI	34.0000	118.3000	06/30/1920	350 0.0	0.0	4.00	0.031	V	11.6(18.7)
MGI	34.0000	118.3000	06/22/1920	2035 0.0	0.0	4.00	0.031	V	11.6(18.7)
MGI	34.0000	118.3000	09/03/1905	540 0.0	0.0	5.30	0.087	VII	11.6(18.7)
PAS	33.9330	118.6690	10/17/1979	205237.3	5.5	4.20	0.036	V	11.7(18.8)
PAS	33.9440	118.6810	01/01/1979	231438.9	11.3	5.00	0.066	VI	11.9(19.1)
DMG	33.9830	118.3000	02/11/1940	192410.0	0.0	4.00	0.030	V	11.9(19.1)
MGI	34.1000	118.3000	07/26/1920	1215 0.0	0.0	4.00	0.028	V	12.5(20.1)
MGI	34.1000	118.3000	07/16/1920	2127 0.0	0.0	4.60	0.045	VI	12.5(20.1)
MGI	34.1000	118.3000	07/16/1920	2022 0.0	0.0	4.60	0.045	VI	12.5(20.1)
MGI	34.1000	118.3000	07/16/1920	2130 0.0	0.0	4.60	0.045	VI	12.5(20.1)
GSP	34.2150	118.5100	01/19/1994	140914.8	17.0	4.50	0.040	V	12.9(20.8)
GSP	34.2130	118.5370	01/17/1994	123055.4	18.0	6.70	0.217	VIII	12.9(20.8)
GSP	34.2310	118.4750	03/20/1994	212012.3	13.0	5.30	0.069	VI	14.1(22.6)
MGI	34.0800	118.2600	07/16/1920	18 8 0.0	0.0	5.00	0.053	VI	14.2(22.9)
GSP	34.2280	118.5730	01/17/1994	175608.2	19.0	4.60	0.038	V	14.4(23.2)
GSP	34.2180	118.6070	01/18/1994	113509.9	12.0	4.20	0.027	V	14.4(23.2)
T-A	34.0000	118.2500	03/26/1860	0 0 0.0	0.0	5.00	0.052	VI	14.5(23.3)
T-A	34.0000	118.2500	09/23/1827	0 0 0.0	0.0	5.00	0.052	VI	14.5(23.3)
T-A	34.0000	118.2500	05/02/1856	810 0.0	0.0	4.30	0.030	V	14.5(23.3)
T-A	34.0000	118.2500	03/21/1880	1425 0.0	0.0	4.30	0.030	V	14.5(23.3)
T-A	34.0000	118.2500	01/10/1856	0 0 0.0	0.0	5.00	0.052	VI	14.5(23.3)
T-A	34.0000	118.2500	01/17/1857	1 0 0.0	0.0	4.30	0.030	V	14.5(23.3)
T-A	34.0000	118.2500	05/04/1857	6 0 0.0	0.0	4.30	0.030	V	14.5(23.3)
DMG	33.8830	118.3170	03/11/1933	1457 0.0	0.0	4.90	0.048	VI	14.5(23.4)
GSP	34.2450	118.4710	01/18/1994	155144.9	12.0	4.00	0.022	IV	15.1(24.2)
GSP	33.9220	118.2700	10/28/2001	162745.6	21.0	4.00	0.022	IV	15.1(24.3)
MGI	33.8000	118.5000	06/18/1915	15 5 0.0	0.0	4.00	0.021	IV	15.8(25.4)
GSP	34.2540	118.5450	01/17/1994	130627.9	0.0	4.60	0.034	V	15.8(25.4)
GSP	34.2610	118.5340	01/17/1994	123939.8	14.0	4.50	0.030	V	16.2(26.0)
DMG	34.2680	118.4450	08/30/1964	225737.1	15.4	4.00	0.019	IV	16.8(27.1)
DMG	34.2650	118.5770	04/15/1971	111432.0	4.2	4.20	0.022	IV	16.9(27.2)
DMG	34.2730	118.5320	06/21/1971	16 1 8.5	4.1	4.00	0.019	IV	17.0(27.3)
GSP	34.2690	118.5760	01/17/1994	125546.8	16.0	4.10	0.020	IV	17.2(27.6)
MGI	34.0000	118.2000	06/26/1917	2120 0.0	0.0	4.60	0.030	V	17.3(27.9)

EARTHQUAKE SEARCH RESULTS

Page 2

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]

MGI	34.0000	118.2000	06/26/1917	2130 0.0	0.0	4.60	0.030	V	17.3(27.9)
MGI	34.0000	118.2000	02/13/1917	13 5 0.0	0.0	4.60	0.030	V	17.3(27.9)
MGI	34.0000	118.2000	06/26/1917	2115 0.0	0.0	4.60	0.030	V	17.3(27.9)
MGI	34.0000	118.2000	06/26/1917	424 0.0	0.0	4.00	0.018	IV	17.3(27.9)
GSP	34.2740	118.5630	01/27/1994	171958.8	14.0	4.60	0.030	V	17.3(27.9)
DMG	33.7830	118.4170	10/12/1940	024 0.0	0.0	4.00	0.018	IV	17.6(28.3)
DMG	33.7830	118.4170	11/01/1940	725 3.0	0.0	4.00	0.018	IV	17.6(28.3)
DMG	33.7830	118.4170	11/02/1940	25826.0	0.0	4.00	0.018	IV	17.6(28.3)
DMG	33.7830	118.4170	10/14/1940	205111.0	0.0	4.00	0.018	IV	17.6(28.3)
DMG	34.2840	118.5280	04/02/1971	54025.0	3.0	4.00	0.018	IV	17.7(28.5)
DMG	34.2860	118.5150	03/31/1971	145222.5	2.1	4.60	0.029	V	17.8(28.7)
DMG	34.1000	118.8000	05/10/1911	1340 0.0	0.0	4.00	0.018	IV	17.8(28.7)
DMG	33.7700	118.4800	04/24/1931	182754.8	0.0	4.40	0.024	V	17.9(28.8)
MGI	34.1000	118.2000	04/21/1921	1538 0.0	0.0	4.00	0.018	IV	17.9(28.8)
MGI	34.1000	118.2000	01/27/1860	830 0.0	0.0	4.30	0.022	IV	17.9(28.8)
MGI	34.1000	118.2000	05/02/1916	1432 0.0	0.0	4.00	0.018	IV	17.9(28.8)
GSP	34.2870	118.4660	01/19/1994	071406.2	11.0	4.00	0.017	IV	18.0(28.9)
DMG	33.9390	118.2050	01/11/1950	214135.0	0.4	4.10	0.019	IV	18.0(29.0)
DMG	33.8500	118.2670	03/11/1933	629 0.0	0.0	4.40	0.024	IV	18.2(29.3)
DMG	33.8500	118.2670	03/11/1933	1425 0.0	0.0	5.00	0.038	V	18.2(29.3)
GSP	34.2910	118.4760	02/06/1994	131926.9	11.0	4.10	0.019	IV	18.2(29.3)
DMG	33.7670	118.4500	10/11/1940	55712.3	0.0	4.70	0.030	V	18.3(29.4)
GSP	34.2920	118.4660	01/19/1994	144635.2	6.0	4.00	0.017	IV	18.3(29.5)
GSP	34.0300	118.1800	06/12/1989	165718.4	16.0	4.40	0.023	IV	18.3(29.5)
GSP	34.0200	118.1800	06/12/1989	172225.5	16.0	4.10	0.018	IV	18.4(29.5)
GSP	34.2780	118.6110	01/29/1994	121656.4	2.0	4.30	0.022	IV	18.4(29.5)
GSP	34.2840	118.4040	01/14/2001	022614.1	8.0	4.30	0.021	IV	18.5(29.8)
DMG	34.2960	118.4640	03/30/1971	85443.3	2.6	4.10	0.018	IV	18.6(29.9)
GSP	34.2970	118.4580	01/21/1994	185344.6	7.0	4.30	0.021	IV	18.7(30.1)
GSP	34.2890	118.4030	01/14/2001	025053.7	8.0	4.00	0.016	IV	18.8(30.3)
GSB	34.3000	118.4660	01/21/1994	183915.3	10.0	4.70	0.029	V	18.9(30.3)
GSP	34.2990	118.4390	02/03/1994	162335.4	8.0	4.20	0.019	IV	19.0(30.6)
GSP	34.3010	118.4520	01/21/1994	185244.2	7.0	4.30	0.021	IV	19.0(30.6)
GSB	34.2850	118.6240	01/17/1994	135602.4	19.0	4.70	0.028	V	19.1(30.7)
GSP	34.3040	118.4730	01/17/1994	150703.2	2.0	4.20	0.019	IV	19.1(30.7)
GSB	34.2990	118.4280	01/23/1994	085508.7	6.0	4.20	0.019	IV	19.1(30.8)
GSB	34.3010	118.5650	01/17/1994	204602.4	9.0	5.20	0.042	VI	19.2(30.9)
GSP	34.2930	118.3890	12/06/1994	034834.5	9.0	4.50	0.024	IV	19.4(31.1)
MGI	33.9000	118.2000	10/08/1927	1914 0.0	0.0	4.60	0.026	V	19.4(31.1)
DMG	34.3080	118.4540	02/09/1971	144346.7	6.2	5.20	0.041	V	19.5(31.4)
MGI	33.8000	118.3000	12/31/1928	1045 0.0	0.0	4.00	0.016	IV	19.5(31.4)
DMG	33.8000	118.3000	11/03/1931	16 5 0.0	0.0	4.00	0.016	IV	19.5(31.4)
GSB	34.3100	118.4740	01/21/1994	184228.8	7.0	4.20	0.018	IV	19.5(31.4)
DMG	34.3000	118.6000	04/04/1893	1940 0.0	0.0	6.00	0.078	VII	19.6(31.5)
GSP	34.3050	118.5790	01/29/1994	112036.0	1.0	5.10	0.038	V	19.6(31.6)
GSP	34.3110	118.4560	01/17/1994	193534.3	2.0	4.00	0.015	IV	19.7(31.7)
DMG	33.8670	118.2170	06/19/1944	0 333.0	0.0	4.50	0.023	IV	19.7(31.7)
DMG	33.8670	118.2170	06/19/1944	3 6 7.0	0.0	4.40	0.021	IV	19.7(31.7)
GSP	34.3000	118.6200	08/09/2007	075849.0	4.0	4.40	0.021	IV	20.0(32.1)
GSP	34.3170	118.4550	01/17/1994	132644.7	2.0	4.70	0.026	V	20.1(32.3)

GSB	34.3190	118.5580	01/18/1994	132444.1	1.0	4.50	0.022	IV	20.3(32.7)
GSP	34.3110	118.3980	06/15/1994	055948.6	7.0	4.20	0.017	IV	20.4(32.8)
DMG	33.8670	118.2000	11/13/1933	2128 0.0	0.0	4.00	0.015	IV	20.5(33.0)

EARTHQUAKE SEARCH RESULTS

Page 3

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.3120	118.3930	05/25/1994	125657.1	7.0	4.40	0.020	IV	20.5(33.0)
GSG	34.3340	118.4840	01/17/1994	223152.1	10.0	4.20	0.016	IV	21.1(34.0)
GSP	34.3310	118.4420	01/17/1994	141430.3	1.0	4.50	0.021	IV	21.2(34.1)
T-A	34.1700	118.1700	03/07/1888	1554 0.0	0.0	4.30	0.018	IV	21.3(34.2)
GSP	34.3390	118.4750	09/01/2011	204708.0	7.0	4.20	0.016	IV	21.5(34.6)
DMG	33.9500	118.1330	10/25/1933	7 046.0	0.0	4.30	0.017	IV	21.7(35.0)
DMG	33.8170	118.2170	10/22/1941	65718.5	0.0	4.90	0.028	V	21.8(35.1)
GSP	34.0690	118.8820	05/02/2009	011113.7	14.0	4.40	0.018	IV	22.0(35.4)
GSB	34.3450	118.5520	01/24/1994	041518.8	6.0	4.80	0.025	V	22.1(35.5)
GSB	34.3330	118.6230	01/18/1994	072356.0	14.0	4.30	0.017	IV	22.2(35.7)
DMG	33.7830	118.2500	11/14/1941	84136.3	0.0	5.40	0.041	V	22.2(35.7)
PAS	34.1490	118.1350	12/03/1988	113826.4	13.3	4.90	0.027	V	22.5(36.2)
DMG	34.3530	118.4560	03/07/1971	13340.5	3.3	4.50	0.019	IV	22.6(36.3)
DMG	34.3560	118.4740	03/25/1971	2254 9.9	4.6	4.20	0.015	IV	22.7(36.5)
GSP	34.3570	118.4800	02/25/1994	125912.6	1.0	4.10	0.014	IV	22.7(36.6)
GSG	34.3040	118.7220	01/17/1994	221922.3	10.0	4.00	0.013	III	22.9(36.8)
PAS	34.0490	118.1010	10/01/1987	144541.5	13.6	4.70	0.022	IV	22.9(36.9)
DMG	34.3610	118.4870	02/10/1971	143526.7	4.4	4.20	0.015	IV	23.0(37.0)
PAS	34.0600	118.1000	10/01/1987	1449 5.9	11.7	4.70	0.022	IV	23.0(37.0)
DMG	34.3440	118.6360	02/09/1971	143436.1	-2.0	4.90	0.026	V	23.1(37.2)
PAS	34.0730	118.0980	10/04/1987	105938.2	8.2	5.30	0.035	V	23.2(37.4)
GSB	34.3600	118.5710	01/19/1994	044048.0	2.0	4.50	0.018	IV	23.2(37.4)
DMG	34.3350	118.3310	02/09/1971	155820.7	14.2	4.80	0.023	IV	23.3(37.5)
DMG	34.3570	118.4060	02/09/1971	141950.2	11.8	4.00	0.012	III	23.3(37.5)
GSP	34.3040	118.7370	01/19/1994	091310.9	13.0	4.10	0.013	III	23.3(37.6)
DMG	33.7590	118.2530	08/31/1938	31814.2	10.0	4.50	0.018	IV	23.4(37.6)
MGI	34.1000	118.1000	07/11/1855	415 0.0	0.0	6.30	0.077	VII	23.4(37.7)
GSP	34.3260	118.6980	01/17/1994	233330.7	9.0	5.60	0.044	VI	23.4(37.7)
DMG	34.3390	118.3320	02/09/1971	141612.9	11.1	4.10	0.013	III	23.5(37.8)
PAS	34.0520	118.0900	10/01/1987	151231.8	10.8	4.70	0.021	IV	23.5(37.9)
GSB	34.3430	118.6660	01/17/1994	234925.4	8.0	4.30	0.015	IV	23.7(38.1)
PAS	34.0500	118.0870	10/01/1987	155953.5	10.4	4.00	0.012	III	23.7(38.2)
PAS	34.0760	118.0900	10/01/1987	1448 3.1	11.7	4.10	0.013	III	23.7(38.2)

PAS	34.3470	118.6560	04/08/1976	152138.1	14.5	4.60	0.019	IV	23.7(38.2)
GSP	34.0490	118.9150	02/19/1995	212418.1	15.0	4.30	0.015	IV	23.7(38.2)
GSB	34.3580	118.6220	01/18/1994	040126.8	1.0	4.50	0.018	IV	23.8(38.3)
GSP	34.3740	118.4950	01/28/1994	200953.4	0.0	4.20	0.014	IV	23.9(38.4)
GSP	34.3620	118.6150	03/20/1996	073759.8	13.0	4.10	0.013	III	23.9(38.5)
GSP	34.3590	118.6290	01/24/1994	055024.3	12.0	4.30	0.015	IV	24.0(38.6)
GSP	33.9920	118.0820	03/16/2010	110400.2	18.0	4.40	0.016	IV	24.1(38.8)
DMG	33.7830	118.2000	12/27/1939	192849.0	0.0	4.70	0.020	IV	24.2(38.9)
GSP	34.3630	118.6270	01/24/1994	055421.1	10.0	4.20	0.014	III	24.2(39.0)
PAS	34.0610	118.0790	10/01/1987	144220.0	9.5	5.90	0.054	VI	24.2(39.0)
PAS	34.3800	118.4590	08/12/1977	21926.1	9.5	4.50	0.017	IV	24.4(39.3)
GSP	34.3790	118.5610	01/18/1994	152346.9	7.0	4.80	0.022	IV	24.5(39.4)
GSP	34.3790	118.5630	01/18/1994	003935.0	7.0	4.40	0.016	IV	24.5(39.4)
DMG	33.9000	118.1000	07/08/1929	1646 6.7	13.0	4.70	0.020	IV	24.6(39.6)
GSP	34.3610	118.6570	01/29/2002	055328.9	14.0	4.20	0.013	III	24.6(39.7)
DMG	34.3840	118.4550	02/10/1971	113134.6	6.0	4.20	0.013	III	24.7(39.7)
GSP	34.3680	118.6370	01/17/1994	194353.4	13.0	4.10	0.012	III	24.7(39.8)
GSP	34.3740	118.6220	01/17/1994	155410.8	12.0	4.80	0.021	IV	24.9(40.0)
GSP	34.3780	118.6180	01/19/1994	211144.9	11.0	5.10	0.027	V	25.1(40.3)
DMG	34.3800	118.6230	10/29/1936	223536.1	10.0	4.00	0.011	III	25.3(40.7)

EARTHQUAKE SEARCH RESULTS

Page 4

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.3540	118.7040	05/01/1996	194956.4	14.0	4.10	0.012	III	25.3(40.7)
DMG	34.3920	118.4270	02/21/1971	71511.7	7.2	4.50	0.016	IV	25.5(41.0)
GSP	34.3690	118.6720	04/26/1997	103730.7	16.0	5.10	0.026	V	25.5(41.0)
DMG	34.3610	118.3060	02/09/1971	141021.5	5.0	4.70	0.019	IV	25.5(41.1)
GSP	34.3770	118.6490	04/27/1997	110928.4	15.0	4.80	0.021	IV	25.5(41.1)
DMG	34.3990	118.4730	03/09/1974	05431.9	24.4	4.70	0.019	IV	25.6(41.3)
DMG	34.3970	118.4390	02/21/1971	55052.6	6.9	4.70	0.019	IV	25.7(41.3)
DMG	33.6630	118.4130	01/08/1967	738 5.3	17.7	4.00	0.011	III	25.7(41.4)
DMG	34.3680	118.3140	04/25/1971	1448 6.5	-2.0	4.00	0.011	III	25.8(41.5)
DMG	34.3870	118.3640	02/09/1971	143917.8	-1.6	4.00	0.011	III	26.0(41.8)
DMG	34.3990	118.4190	02/10/1971	134953.7	9.7	4.30	0.013	III	26.0(41.9)
GSP	34.3650	118.7080	01/19/1994	044314.5	12.0	4.10	0.011	III	26.1(42.0)
DMG	33.9670	118.0500	01/30/1941	13446.9	0.0	4.10	0.011	III	26.1(42.1)
PAS	34.0770	118.0470	02/11/1988	152555.7	12.5	4.70	0.018	IV	26.2(42.1)
DMG	34.3700	118.3020	02/10/1971	31212.0	0.8	4.00	0.010	III	26.2(42.1)
GSP	34.3970	118.6090	07/22/1999	095724.0	11.0	4.00	0.010	III	26.2(42.2)

GSG	34.4080	118.5590	01/17/1994	200205.4	0.0	4.00	0.010	III	26.4(42.5)
DMG	33.7500	118.1830	08/04/1933	41748.0	0.0	4.00	0.010	III	26.5(42.6)
DMG	34.3960	118.3660	02/10/1971	173855.1	6.2	4.20	0.012	III	26.5(42.7)
PAS	34.0540	118.9640	04/13/1982	11 212.2	16.6	4.00	0.010	III	26.6(42.8)
GSP	34.3770	118.6980	01/18/1994	004308.9	11.0	5.20	0.027	V	26.6(42.8)
GSP	33.6583	118.3722	05/15/2013	200006.2	1.1	4.08	0.011	III	26.6(42.8)
DMG	34.0170	118.9670	04/16/1948	222624.0	0.0	4.70	0.018	IV	26.7(43.0)
GSP	34.3940	118.6690	06/26/1995	084028.9	13.0	5.00	0.022	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 2 3.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 140.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 444.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 346.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 8 4.0	8.0	4.00	0.010	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 041.8	8.4	6.40	0.069	VI	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 244.0	8.0	5.80	0.043	VI	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 231.0	8.0	4.70	0.018	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 434.0	8.0	4.20	0.012	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 150.0	8.0	4.50	0.015	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	141028.0	8.0	5.30	0.028	V	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 550.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 439.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 1 8.0	8.0	5.80	0.043	VI	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 133.0	8.0	4.20	0.012	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 4 7.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 853.0	8.0	4.60	0.016	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 446.0	8.0	4.20	0.012	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 159.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 838.0	8.0	4.50	0.015	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 230.0	8.0	4.30	0.013	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 8 7.0	8.0	4.20	0.012	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 730.0	8.0	4.00	0.010	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 154.0	8.0	4.20	0.012	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 325.0	8.0	4.40	0.014	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 745.0	8.0	4.50	0.015	IV	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 541.0	8.0	4.10	0.011	III	27.0(43.5)
DMG	34.4110	118.4010	02/09/1971	14 710.0	8.0	4.00	0.010	III	27.0(43.5)
DMG	33.7830	118.1330	01/13/1940	749 7.0	0.0	4.00	0.010	III	27.0(43.5)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]

DMG	33.7830	118.1330	11/20/1933	1032 0.0	0.0	4.00	0.010	III	27.0(43.5)
DMG	33.7830	118.1330	10/02/1933	91017.6	0.0	5.40	0.031	V	27.0(43.5)
GSB	34.3790	118.7110	01/19/1994	210928.6	14.0	5.50	0.034	V	27.0(43.5)
DMG	33.7500	118.1670	05/16/1933	205855.0	0.0	4.00	0.010	III	27.1(43.6)
DMG	33.6320	118.4670	01/08/1967	73730.4	11.4	4.00	0.010	III	27.4(44.1)
DMG	33.6330	118.4000	10/17/1934	938 0.0	0.0	4.00	0.010	III	27.9(44.9)
DMG	34.4260	118.4140	02/10/1971	518 7.2	5.8	4.50	0.014	IV	27.9(44.9)
PAS	34.0160	118.9880	10/26/1984	172043.5	13.3	4.60	0.015	IV	27.9(44.9)
DMG	34.4280	118.4130	04/01/1971	15 3 3.6	8.0	4.10	0.010	III	28.0(45.1)
DMG	34.4110	118.3290	02/10/1971	5 636.0	4.7	4.30	0.012	III	28.2(45.3)
DMG	33.7670	118.1170	11/04/1939	2141 0.0	0.0	4.00	0.009	III	28.4(45.8)
DMG	33.7500	118.1330	03/11/1933	11 4 0.0	0.0	4.60	0.015	IV	28.5(45.9)
DMG	34.4330	118.3980	02/09/1971	144017.4	-2.0	4.10	0.010	III	28.5(45.9)
DMG	34.0000	119.0000	09/24/1827	4 0 0.0	0.0	7.00	0.100	VII	28.6(46.1)
MGI	34.0000	119.0000	12/14/1912	0 0 0.0	0.0	5.70	0.036	V	28.6(46.1)
MGI	34.0000	118.0000	05/05/1929	1 7 0.0	0.0	4.60	0.015	IV	28.7(46.2)
MGI	34.0000	118.0000	12/25/1903	1745 0.0	0.0	5.00	0.021	IV	28.7(46.2)
MGI	34.0000	118.0000	05/05/1929	735 0.0	0.0	4.00	0.009	III	28.7(46.2)
DMG	34.4310	118.3690	08/14/1974	144555.2	8.2	4.20	0.011	III	28.8(46.3)
MGI	34.1000	118.0000	01/27/1930	2026 0.0	0.0	4.60	0.015	IV	29.1(46.8)
DMG	34.4460	118.4360	02/10/1971	185441.7	8.1	4.20	0.011	III	29.1(46.8)
DMG	34.4570	118.4270	02/09/1971	161926.5	-1.0	4.20	0.010	III	29.9(48.1)
DMG	33.9960	117.9750	06/15/1967	458 5.5	10.0	4.10	0.009	III	30.2(48.5)
PAS	34.4630	118.4090	09/24/1977	212824.3	5.0	4.20	0.010	III	30.5(49.0)
DMG	34.0650	119.0350	02/21/1973	144557.3	8.0	5.90	0.039	V	30.7(49.4)
DMG	33.7500	118.0830	03/31/1933	1049 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	521 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	2 4 0.0	0.0	4.90	0.017	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	515 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	837 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/15/1933	2 8 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/14/1933	2242 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	911 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	259 0.0	0.0	4.60	0.014	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	3 5 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1547 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	2 5 0.0	0.0	4.30	0.011	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	832 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	252 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	257 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	258 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1141 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/13/1933	1532 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1944 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	230 0.0	0.0	5.10	0.020	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1357 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	513 0.0	0.0	4.70	0.015	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	440 0.0	0.0	4.70	0.015	IV	30.7(49.4)
DMG	33.7500	118.0830	03/13/1933	1929 0.0	0.0	4.20	0.010	III	30.7(49.4)

DMG	33.7500	118.0830	03/12/1933	546 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	04/02/1933	1536 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	04/02/1933	8 0 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	210 0.0	0.0	4.60	0.014	III	30.7(49.4)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.7500	118.0830	03/11/1933	22 0 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	2231 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	211 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	04/01/1933	642 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/19/1933	2123 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	2232 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	216 0.0	0.0	4.80	0.016	IV	30.7(49.4)
DMG	33.7500	118.0830	03/21/1933	326 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/25/1933	1346 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	222 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/30/1933	1225 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	448 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	034 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	8 8 0.0	0.0	4.50	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	6 1 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/16/1933	1456 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1956 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/16/1933	1530 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/17/1933	1651 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	2240 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	347 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	436 0.0	0.0	4.60	0.014	III	30.7(49.4)
DMG	33.7500	118.0830	03/13/1933	617 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1138 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1147 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/14/1933	1219 0.0	0.0	4.50	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/14/1933	036 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	751 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	759 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	611 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/23/1933	840 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	616 0.0	0.0	4.60	0.014	III	30.7(49.4)

DMG	33.7500	118.0830	03/12/1933	740 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1653 0.0	0.0	4.80	0.016	IV	30.7(49.4)
DMG	33.7500	118.0830	03/16/1933	1529 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	2 9 0.0	0.0	5.00	0.019	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	323 0.0	0.0	5.00	0.019	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	339 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	618 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	227 0.0	0.0	4.60	0.014	III	30.7(49.4)
DMG	33.7500	118.0830	03/23/1933	1831 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	027 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	23 5 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	635 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/20/1933	1358 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1045 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/13/1933	131828.0	0.0	5.30	0.024	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1129 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/13/1933	432 0.0	0.0	4.70	0.015	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	3 9 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	15 2 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	553 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/15/1933	432 0.0	0.0	4.10	0.009	III	30.7(49.4)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	33.7500	118.0830	03/13/1933	343 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	311 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	336 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	555 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	910 0.0	0.0	5.10	0.020	IV	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	439 0.0	0.0	4.90	0.017	IV	30.7(49.4)
DMG	33.7500	118.0830	03/15/1933	540 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	1025 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	1738 0.0	0.0	4.50	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	1651 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	1825 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	2354 0.0	0.0	4.50	0.012	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	11 0 0.0	0.0	4.00	0.008	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	524 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/11/1933	926 0.0	0.0	4.10	0.009	III	30.7(49.4)

DMG	33.7500	118.0830	03/12/1933	2128 0.0	0.0	4.10	0.009	III	30.7(49.4)
DMG	33.7500	118.0830	03/18/1933	2052 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7500	118.0830	03/12/1933	835 0.0	0.0	4.20	0.010	III	30.7(49.4)
DMG	33.7330	118.1000	03/11/1933	15 9 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7330	118.1000	03/11/1933	1447 0.0	0.0	4.40	0.012	III	30.7(49.4)
DMG	33.7330	118.1000	03/11/1933	1350 0.0	0.0	4.40	0.012	III	30.7(49.4)
MGI	34.2000	118.0000	01/09/1921	530 0.0	0.0	4.60	0.013	III	31.0(49.8)
DMG	34.4850	118.5210	07/16/1965	74622.4	15.1	4.00	0.008	III	31.5(50.8)
DMG	33.9900	119.0580	05/29/1955	164335.4	17.4	4.10	0.009	III	32.0(51.5)
DMG	33.6330	118.2000	11/01/1940	20 046.0	0.0	4.00	0.008	II	32.3(51.9)
DMG	33.6300	118.2000	09/13/1929	132338.2	0.0	4.00	0.008	II	32.5(52.2)
DMG	33.8000	118.0000	10/21/1913	938 0.0	0.0	4.00	0.008	II	32.7(52.7)
GSP	34.2620	118.0020	06/28/1991	144354.5	11.0	5.40	0.024	IV	32.7(52.7)
GSP	34.5000	118.5600	07/05/1991	174157.1	11.0	4.10	0.008	III	32.7(52.7)
DMG	34.4170	118.8330	06/01/1946	11 631.0	0.0	4.10	0.008	III	32.9(52.9)
GSP	34.2500	117.9900	06/28/1991	170055.5	9.0	4.30	0.010	III	32.9(53.0)
DMG	33.7000	118.0670	03/11/1933	51022.0	0.0	5.10	0.018	IV	33.6(54.1)
DMG	33.7000	118.0670	03/11/1933	85457.0	0.0	5.10	0.018	IV	33.6(54.1)
DMG	33.7000	118.0670	02/08/1940	165617.0	0.0	4.00	0.007	II	33.6(54.1)
DMG	33.7000	118.0670	07/20/1940	4 113.0	0.0	4.00	0.007	II	33.6(54.1)
GSP	33.9325	117.9158	03/29/2014	040942.2	5.1	5.10	0.017	IV	34.1(54.9)
DMG	33.7500	118.0000	11/16/1934	2126 0.0	0.0	4.00	0.007	II	34.5(55.6)
DMG	33.5430	118.3400	09/14/1963	35116.2	2.2	4.20	0.008	III	34.7(55.9)
GSP	33.9613	117.8923	03/29/2014	213245.9	9.3	4.14	0.008	II	35.1(56.5)
DMG	33.6830	118.0500	03/11/1933	1250 0.0	0.0	4.40	0.010	III	35.2(56.6)
DMG	33.6830	118.0500	03/11/1933	658 3.0	0.0	5.50	0.023	IV	35.2(56.6)
PAS	33.9650	117.8860	01/01/1976	172012.9	6.2	4.20	0.008	III	35.4(57.0)
DMG	34.5290	118.6440	02/07/1956	21656.5	16.0	4.20	0.008	III	35.5(57.2)
DMG	33.6170	118.1170	01/20/1934	2117 0.0	0.0	4.50	0.010	III	35.9(57.8)
T-A	34.4200	118.9200	03/29/1917	8 6 0.0	0.0	4.30	0.008	III	36.1(58.1)
DMG	34.2000	117.9000	08/28/1889	215 0.0	0.0	5.50	0.022	IV	36.3(58.4)
DMG	34.2000	117.9000	07/13/1935	105416.5	0.0	4.70	0.012	III	36.3(58.4)
DMG	33.6710	118.0120	10/20/1961	223534.2	5.6	4.10	0.007	II	37.3(60.1)
DMG	33.6800	117.9930	11/20/1961	85334.7	4.4	4.00	0.006	II	37.8(60.8)
PAS	33.5380	118.2070	05/25/1982	134430.3	13.7	4.10	0.007	II	37.8(60.8)
MGI	33.8000	117.9000	05/22/1902	740 0.0	0.0	4.30	0.008	II	37.8(60.9)
DMG	34.5190	118.1980	08/23/1952	10 9 7.1	13.1	5.00	0.014	IV	38.0(61.2)
DMG	33.6540	117.9940	10/20/1961	194950.5	4.6	4.30	0.008	II	38.9(62.6)

EARTHQUAKE SEARCH RESULTS

Page 8

FILE	LAT.	LONG.	DATE	TIME (UTC)	DEPTH	QUAKE	SITE ACC.	SITE MM	APPROX. DISTANCE

CODE	NORTH	WEST		H M Sec	(km)	MAG.	g	INT.	mi [km]
PAS	34.3780	119.0350	04/03/1985	4 449.8	27.9	4.00	0.006	II	38.9(62.6)
PAS	33.9060	119.1660	05/23/1978	91650.8	6.0	4.00	0.006	II	39.0(62.8)
DMG	34.5860	118.6130	02/07/1956	31638.6	2.6	4.60	0.010	III	39.0(62.8)
DMG	33.6650	117.9790	10/20/1961	214240.7	7.2	4.00	0.006	II	39.0(62.8)
DMG	33.6170	118.0330	05/21/1938	944 0.0	0.0	4.00	0.006	II	39.1(62.9)
DMG	33.5000	118.2500	06/18/1920	10 8 0.0	0.0	4.50	0.009	III	39.2(63.1)
DMG	33.6590	117.9810	10/20/1961	20 714.5	6.1	4.00	0.006	II	39.2(63.1)
GSP	33.6920	119.0580	05/30/2012	051400.8	16.0	4.00	0.006	II	39.5(63.6)
DMG	33.6170	118.0170	03/14/1933	19 150.0	0.0	5.10	0.014	IV	39.7(63.9)
DMG	33.6170	118.0170	03/15/1933	111332.0	0.0	4.90	0.012	III	39.7(63.9)
DMG	33.6170	118.0170	10/02/1933	1326 1.0	0.0	4.00	0.006	II	39.7(63.9)
DMG	34.1000	117.8000	03/31/1931	2033 0.0	0.0	4.00	0.006	II	40.4(65.0)
PAS	33.6300	119.0200	10/23/1981	172816.9	12.0	4.60	0.009	III	40.5(65.2)
DMG	33.6000	118.0170	12/25/1935	1715 0.0	0.0	4.50	0.008	III	40.5(65.2)
DMG	33.5610	118.0580	01/15/1937	183547.0	10.0	4.00	0.006	II	41.1(66.1)
DMG	33.6000	118.0000	03/11/1933	231 0.0	0.0	4.40	0.008	II	41.2(66.3)
DMG	33.6000	118.0000	03/11/1933	217 0.0	0.0	4.50	0.008	III	41.2(66.3)
MGI	33.7000	117.9000	07/08/1902	945 0.0	0.0	4.00	0.005	II	41.2(66.3)
GSP	34.6173	118.6302	01/04/2015	031809.5	8.8	4.25	0.007	II	41.3(66.5)
GSP	33.9090	117.7920	06/14/2012	031715.7	9.0	4.00	0.005	II	41.4(66.6)
GSP	33.9050	117.7920	08/08/2012	062334.1	10.0	4.50	0.008	III	41.5(66.7)
GSP	33.9040	117.7910	08/08/2012	163322.1	10.0	4.50	0.008	III	41.5(66.8)
DMG	34.1180	119.2200	03/18/1957	185628.0	13.8	4.70	0.010	III	41.6(66.9)
GSP	33.9070	117.7880	08/29/2012	203100.3	9.0	4.10	0.006	II	41.7(67.0)
MGI	34.2000	119.2000	06/16/1914	1052 0.0	0.0	4.60	0.009	III	41.7(67.1)
DMG	33.6170	117.9670	03/11/1933	154 7.8	0.0	6.30	0.035	V	41.7(67.2)
DMG	34.4830	118.9830	09/04/1942	63433.0	0.0	4.50	0.008	III	41.8(67.2)
DMG	34.4830	118.9830	09/03/1942	14 6 1.0	0.0	4.50	0.008	III	41.8(67.2)
PAS	33.6370	119.0560	10/23/1981	191552.5	6.3	4.60	0.009	III	41.8(67.2)
DMG	33.5170	118.1000	03/22/1941	82240.0	0.0	4.00	0.005	II	42.1(67.8)
GSP	33.9170	117.7760	09/03/2002	070851.9	12.0	4.80	0.010	III	42.2(67.9)
GSG	33.9530	117.7610	07/29/2008	184215.7	14.0	5.30	0.015	IV	42.7(68.6)
PAS	33.6710	119.1110	09/04/1981	155050.3	5.0	5.30	0.015	IV	42.8(68.9)
MGI	33.8000	117.8000	11/04/1926	2238 0.0	0.0	4.60	0.008	III	43.1(69.4)
MGI	33.8000	117.8000	11/10/1926	1723 0.0	0.0	4.60	0.008	III	43.1(69.4)
MGI	33.8000	117.8000	11/09/1926	1535 0.0	0.0	4.60	0.008	III	43.1(69.4)
MGI	33.8000	117.8000	05/19/1917	719 0.0	0.0	4.00	0.005	II	43.1(69.4)
MGI	33.8000	117.8000	05/20/1917	945 0.0	0.0	4.00	0.005	II	43.1(69.4)
MGI	33.8000	117.8000	05/19/1917	635 0.0	0.0	4.00	0.005	II	43.1(69.4)
MGI	33.8000	117.8000	11/07/1926	1948 0.0	0.0	4.60	0.008	III	43.1(69.4)
DMG	33.7670	117.8170	08/22/1936	521 0.0	0.0	4.00	0.005	II	43.1(69.4)
DMG	33.5750	117.9830	03/11/1933	518 4.0	0.0	5.20	0.014	III	43.1(69.4)
DMG	34.5650	118.1130	02/28/1969	45612.4	5.3	4.30	0.007	II	43.1(69.4)
GSP	33.9550	117.7460	12/14/2001	120135.5	13.0	4.00	0.005	II	43.5(70.0)
DMG	33.5670	117.9830	04/17/1934	1833 0.0	0.0	4.00	0.005	II	43.5(70.1)
DMG	33.5670	117.9830	07/07/1937	1112 0.0	0.0	4.00	0.005	II	43.5(70.1)
PAS	33.5080	118.0710	11/20/1988	53928.7	6.0	4.50	0.008	II	43.6(70.1)
PAS	34.0060	117.7390	02/18/1989	717 4.8	3.3	4.30	0.006	II	43.6(70.2)

GSP	33.6200	117.9000	04/07/1989	200730.2	13.0	4.50	0.007	II	44.5(71.6)
DMG	33.8540	117.7520	10/04/1961	22131.6	4.3	4.10	0.005	II	44.5(71.7)
GSP	34.1100	117.7200	04/17/1990	223227.2	4.0	4.60	0.008	II	45.0(72.4)
PAS	34.5410	118.9890	06/12/1984	02752.4	11.7	4.10	0.005	II	45.0(72.5)
DMG	33.6040	119.1050	03/25/1956	332 2.3	8.2	4.20	0.006	II	45.4(73.0)

EARTHQUAKE SEARCH RESULTS

Page 9

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.1500	117.7200	03/01/1990	032303.0	11.0	4.70	0.008	III	45.4(73.1)
DMG	34.6000	118.9000	05/18/1940	91512.0	0.0	4.00	0.005	II	45.6(73.3)
GSP	33.9510	117.7090	01/05/1998	181406.5	11.0	4.30	0.006	II	45.6(73.4)
MGI	34.0000	117.7000	12/03/1929	9 5 0.0	0.0	4.00	0.005	II	45.9(73.8)
PAS	34.1360	117.7090	06/26/1988	15 458.5	7.9	4.60	0.008	II	45.9(73.8)
PAS	33.4710	118.0610	02/27/1984	101815.0	6.0	4.00	0.005	II	46.0(74.0)
GSP	34.1300	117.7000	03/01/1990	003457.1	4.0	4.00	0.005	II	46.3(74.5)
GSP	34.1400	117.7000	02/28/1990	234336.6	5.0	5.20	0.012	III	46.4(74.7)
GSP	33.5150	119.0330	08/24/2010	054216.9	16.0	4.00	0.005	II	46.8(75.3)
GSP	34.1400	117.6900	03/02/1990	172625.4	6.0	4.60	0.007	II	47.0(75.6)
DMG	34.1000	117.6830	01/09/1934	1410 0.0	0.0	4.50	0.007	II	47.0(75.7)
DMG	34.1000	117.6830	01/18/1934	214 0.0	0.0	4.00	0.005	II	47.0(75.7)
GSP	34.5217	119.0748	03/12/2016	084240.3	19.3	4.13	0.005	II	47.3(76.1)
DMG	34.4000	117.8000	02/24/1946	6 752.0	0.0	4.10	0.005	II	47.5(76.5)
GSP	33.8060	117.7150	03/07/2000	002028.2	11.0	4.00	0.004	I	47.6(76.5)
DMG	34.5000	119.1170	11/17/1954	23 351.0	0.0	4.40	0.006	II	47.9(77.1)
DMG	34.6670	118.8330	01/24/1950	215659.0	0.0	4.00	0.004	I	48.0(77.2)
GSP	34.4400	119.1830	05/08/2009	202714.0	7.0	4.10	0.005	II	48.2(77.6)
DMG	34.1500	119.3500	08/22/1950	224758.0	0.0	4.20	0.005	II	49.3(79.3)
MGI	34.3000	119.3000	05/15/1927	1120 0.0	0.0	4.00	0.004	I	49.4(79.4)
MGI	34.3000	119.3000	09/28/1926	1749 0.0	0.0	4.00	0.004	I	49.4(79.4)
MGI	34.3000	119.3000	05/01/1904	1830 0.0	0.0	4.60	0.007	II	49.4(79.4)
DMG	33.5830	119.1830	02/10/1952	135055.0	0.0	4.00	0.004	I	49.8(80.1)
DMG	33.3670	118.1500	04/16/1942	72833.0	0.0	4.00	0.004	I	49.9(80.3)
DMG	34.1000	119.4000	05/19/1893	035 0.0	0.0	5.50	0.013	III	51.7(83.2)
DMG	33.5450	117.8070	10/27/1969	1316 2.3	6.5	4.50	0.006	II	51.9(83.6)
MGI	34.4000	119.3000	08/12/1925	1845 0.0	0.0	4.00	0.004	I	52.4(84.3)
DMG	34.6170	119.0830	02/26/1950	0 622.0	0.0	4.70	0.007	II	52.5(84.5)
DMG	33.9500	117.5830	04/11/1941	12024.0	0.0	4.00	0.004	I	52.8(85.0)
DMG	34.6830	119.0000	04/06/1943	223624.0	0.0	4.00	0.004	I	53.4(86.0)
DMG	34.1830	117.5830	10/03/1948	24628.0	0.0	4.00	0.004	I	53.5(86.1)

DMG	33.4300	119.0960	10/31/1969	103929.0	7.3	4.80	0.007	II	53.6(86.3)
GSP	33.6660	119.3300	03/16/2002	213323.8	7.0	4.60	0.006	II	53.7(86.5)
DMG	33.8000	117.6000	09/16/1903	1210 0.0	0.0	4.00	0.004	I	54.0(86.8)
MGI	33.8000	117.6000	04/22/1918	2115 0.0	0.0	5.00	0.008	III	54.0(86.8)
DMG	34.3700	117.6500	12/08/1812	15 0 0.0	0.0	7.00	0.042	VI	54.0(86.9)
GSP	34.3740	117.6490	08/20/1998	234958.4	9.0	4.40	0.005	II	54.2(87.2)
DMG	34.7000	119.0000	10/23/1916	254 0.0	0.0	5.50	0.012	III	54.4(87.6)
DMG	34.7170	118.9670	06/11/1935	1810 0.0	0.0	4.00	0.004	I	54.5(87.7)
DMG	34.3000	117.6000	07/30/1894	512 0.0	0.0	6.00	0.018	IV	54.8(88.1)
GSP	34.3850	117.6350	10/16/2007	085344.1	8.0	4.20	0.004	I	55.2(88.9)
DMG	34.1830	117.5480	09/01/1937	163533.5	10.0	4.50	0.005	II	55.5(89.3)
DMG	33.9860	119.4750	08/06/1973	232917.0	16.9	5.00	0.008	III	55.8(89.9)
DMG	34.1670	117.5330	03/01/1948	81213.0	0.0	4.70	0.006	II	56.1(90.3)
DMG	34.1270	117.5210	12/27/1938	10 928.6	10.0	4.00	0.004	I	56.4(90.8)
DMG	34.3040	117.5700	05/05/1969	16 2 9.6	8.8	4.40	0.005	II	56.5(90.9)
DMG	34.1400	117.5150	01/01/1965	8 418.0	5.9	4.40	0.005	II	56.9(91.5)
DMG	34.2110	117.5300	09/01/1937	1348 8.2	10.0	4.50	0.005	II	56.9(91.6)
PAS	34.2110	117.5300	10/19/1979	122237.8	4.9	4.10	0.004	I	56.9(91.6)
DMG	34.2810	117.5520	09/13/1970	44748.6	8.0	4.40	0.005	II	56.9(91.6)
DMG	34.7840	118.9020	07/27/1972	03117.4	8.0	4.40	0.005	II	57.0(91.7)
T-A	34.8300	118.7500	11/27/1852	0 0 0.0	0.0	7.00	0.039	V	57.1(92.0)
MGI	34.0000	119.5000	05/03/1926	1353 0.0	0.0	4.30	0.004	I	57.2(92.1)

EARTHQUAKE SEARCH RESULTS

Page 10

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	34.0000	119.5000	02/18/1926	1818 0.0	0.0	5.00	0.008	II	57.2(92.1)
DMG	34.0000	119.5000	03/19/1905	440 0.0	0.0	4.00	0.003	I	57.2(92.1)
DMG	34.0000	117.5000	07/03/1908	1255 0.0	0.0	4.00	0.003	I	57.3(92.2)
MGI	34.0000	117.5000	12/16/1858	10 0 0.0	0.0	7.00	0.038	V	57.3(92.2)
DMG	34.2700	117.5400	09/12/1970	143053.0	8.0	5.40	0.011	III	57.4(92.3)
DMG	33.9170	119.5000	08/26/1954	1348 3.0	0.0	4.80	0.006	II	57.7(92.9)
GSP	34.4810	119.3530	10/23/1996	220929.4	14.0	4.20	0.004	I	57.8(93.0)
DMG	34.2000	117.5000	06/14/1892	1325 0.0	0.0	4.90	0.007	II	58.4(94.0)
DMG	34.2670	117.5180	09/12/1970	141011.2	8.0	4.10	0.004	I	58.5(94.2)
GSP	34.3810	119.4350	07/24/2004	125519.9	3.0	4.30	0.004	I	58.6(94.4)
DMG	34.1240	117.4800	05/15/1955	17 326.0	7.6	4.00	0.003	I	58.7(94.5)
DMG	33.3390	119.1040	10/24/1969	202642.5	-1.8	4.70	0.006	II	58.9(94.7)
DMG	34.1160	117.4750	06/28/1960	20 048.0	12.0	4.10	0.004	I	59.0(94.9)
DMG	34.2500	119.5000	04/13/1917	359 0.0	0.0	4.50	0.005	II	59.1(95.1)

DMG	34.2500	119.5000	04/21/1917	659 0.0	0.0	4.00	0.003	I	59.1(95.1)
DMG	33.6820	117.5530	07/05/1938	18 655.7	10.0	4.50	0.005	II	59.4(95.5)
GSP	34.1390	117.4650	03/09/2008	092232.1	3.0	4.00	0.003	I	59.7(96.1)
DMG	34.3000	117.5000	07/22/1899	2032 0.0	0.0	6.50	0.024	V	60.2(96.8)
DMG	33.7170	117.5170	06/19/1935	1117 0.0	0.0	4.00	0.003	I	60.3(97.1)
DMG	34.2670	119.5170	04/12/1944	153310.0	0.0	4.00	0.003	I	60.4(97.1)
DMG	34.2170	117.4670	03/25/1941	234341.0	0.0	4.00	0.003	I	60.5(97.4)
PAS	34.1350	117.4480	01/08/1983	71930.4	4.6	4.10	0.003	I	60.6(97.6)
DMG	34.3490	119.4920	07/14/1958	52555.3	16.0	4.70	0.006	II	60.8(97.8)
DMG	33.7170	117.5070	08/06/1938	22 056.0	10.0	4.00	0.003	I	60.9(98.0)
GSP	34.1430	117.4425	01/15/2014	093518.9	2.9	4.43	0.004	I	61.0(98.2)
DMG	33.6990	117.5110	05/31/1938	83455.4	10.0	5.50	0.011	III	61.1(98.4)
GSP	34.1250	117.4380	01/06/2005	143527.7	4.0	4.40	0.004	I	61.1(98.4)
DMG	33.7250	117.4980	01/03/1956	02548.9	13.7	4.70	0.006	II	61.2(98.4)
USG	34.4180	119.4680	09/07/1984	11 345.2	9.5	4.00	0.003	I	61.4(98.9)
DMG	34.8670	118.8670	07/22/1952	74455.0	0.0	4.10	0.003	I	61.5(99.0)
DMG	33.7480	117.4790	06/22/1971	104119.0	8.0	4.20	0.004	I	61.7(99.2)
DMG	34.1120	117.4260	03/19/1937	12338.4	10.0	4.00	0.003	I	61.7(99.3)
DMG	34.1320	117.4260	04/15/1965	20 833.3	5.5	4.50	0.005	II	61.9(99.6)
T-A	34.0000	117.4200	04/12/1888	1315 0.0	0.0	4.30	0.004	I	61.9(99.6)
T-A	34.0000	117.4200	09/10/1920	1415 0.0	0.0	4.30	0.004	I	61.9(99.6)
DMG	34.8350	118.9880	11/29/1936	55445.3	10.0	4.00	0.003	I	62.2(100.1)
DMG	33.6670	119.5000	11/30/1939	64251.0	0.0	4.00	0.003	I	62.5(100.6)
DMG	33.7330	117.4670	10/26/1954	162226.0	0.0	4.10	0.003	I	62.7(100.8)
GSP	33.7330	117.4660	09/02/2007	172914.0	2.0	4.70	0.005	II	62.7(100.9)
DMG	34.8670	118.9330	09/21/1941	1953 7.2	0.0	5.20	0.008	III	62.9(101.3)
MGI	34.0000	117.4000	05/22/1907	652 0.0	0.0	4.60	0.005	II	63.0(101.4)
DMG	34.2670	119.5670	06/29/1968	191357.0	10.0	4.40	0.004	I	63.1(101.6)
GSP	34.1910	117.4132	12/30/2015	014857.3	7.0	4.40	0.004	I	63.2(101.7)
DMG	34.8000	119.1000	09/05/1883	1230 0.0	0.0	6.00	0.015	IV	63.3(101.8)
DMG	34.8430	119.0260	03/07/1939	195331.8	10.0	4.00	0.003	I	63.7(102.5)
DMG	34.2450	119.5880	06/29/1968	203633.6	1.8	4.00	0.003	I	63.9(102.9)
DMG	34.2000	117.4000	07/22/1899	046 0.0	0.0	5.50	0.010	III	64.0(103.0)
USG	34.1390	117.3860	02/21/1987	231530.1	2.6	4.07	0.003	I	64.2(103.3)
DMG	34.9000	118.9000	10/23/1916	244 0.0	0.0	6.00	0.015	IV	64.3(103.5)
GSP	34.1900	117.3900	12/28/1989	094108.1	15.0	4.50	0.004	I	64.5(103.7)
DMG	33.8330	117.4000	06/05/1940	82727.0	0.0	4.00	0.003	I	64.5(103.8)
DMG	33.2910	119.1930	10/24/1969	82912.1	10.0	5.10	0.007	II	64.6(104.0)
PAS	34.9430	118.7430	06/10/1988	23 643.0	6.8	5.40	0.009	III	64.6(104.0)

EARTHQUAKE SEARCH RESULTS

				TIME			SITE	SITE	APPROX.

FILE CODE	LAT. NORTH	LONG. WEST	DATE	(UTC) H M Sec	DEPTH (km)	QUAKE MAG.	ACC. g	MM INT.	DISTANCE mi [km]
DMG	34.8670	119.0170	07/21/1952	2153 9.0	0.0	4.30	0.004	I	64.9(104.5)
DMG	33.9330	117.3670	10/24/1943	02921.0	0.0	4.00	0.003	I	65.2(105.0)
DMG	34.3330	119.5830	07/01/1941	848 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	819 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	09/08/1941	31423.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/12/1941	1618 0.0	0.0	4.50	0.004	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	2354 0.0	0.0	4.50	0.004	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	830 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	09/25/1941	51256.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	09/14/1941	14518.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	09/08/1941	31245.0	0.0	4.50	0.004	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	1025 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	858 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/03/1941	1926 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	945 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/02/1941	2219 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	821 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	11/21/1941	1656 3.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	09/15/1941	137 2.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	10/02/1938	1845 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	9 5 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	07/01/1941	1820 0.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.3330	119.5830	11/18/1941	18 810.0	0.0	4.00	0.003	I	65.3(105.1)
DMG	34.9000	118.9500	08/01/1952	13 430.0	0.0	5.10	0.007	II	65.4(105.2)
DMG	34.2550	119.6140	07/31/1968	224445.3	15.0	4.00	0.003	I	65.5(105.4)
DMG	34.5000	119.5000	06/29/1926	2321 0.0	0.0	5.50	0.010	III	65.7(105.7)
DMG	34.5000	119.5000	08/05/1930	1125 0.0	0.0	5.00	0.006	II	65.7(105.7)
DMG	34.5000	119.5000	12/05/1920	1158 0.0	0.0	4.50	0.004	I	65.7(105.7)
DMG	34.8850	119.0020	02/23/1939	91846.7	10.0	4.50	0.004	I	65.7(105.7)
DMG	34.0330	117.3500	04/18/1940	184343.9	0.0	4.40	0.004	I	65.8(105.9)
PAS	34.2510	119.6220	03/23/1988	84247.0	16.4	4.00	0.003	I	65.9(106.0)
T-A	34.9200	118.9200	08/29/1857	0 0 0.0	0.0	4.30	0.004	I	66.0(106.3)
T-A	34.9200	118.9200	01/20/1857	0 0 0.0	0.0	5.00	0.006	II	66.0(106.3)
T-A	34.9200	118.9200	05/23/1857	0 0 0.0	0.0	5.00	0.006	II	66.0(106.3)
DMG	34.3670	119.5830	07/01/1941	75054.8	0.0	5.90	0.013	III	66.1(106.3)
DMG	34.2540	119.6280	07/08/1968	91837.2	15.7	4.00	0.003	I	66.3(106.7)
DMG	34.8830	119.0330	08/20/1952	84747.0	0.0	4.20	0.003	I	66.3(106.8)
DMG	34.1830	119.6460	06/29/1968	63320.9	8.4	4.00	0.003	I	66.3(106.8)
DMG	34.1180	117.3410	09/22/1951	82239.1	11.9	4.30	0.004	I	66.6(107.2)
DMG	34.9110	118.9730	02/23/1939	84551.7	10.0	4.50	0.004	I	66.6(107.2)
DMG	34.1270	117.3380	02/23/1936	222042.7	10.0	4.50	0.004	I	66.8(107.6)
DMG	34.1400	117.3390	02/26/1936	93327.6	10.0	4.00	0.003	I	66.9(107.6)
DMG	34.9500	118.8670	07/21/1952	121936.0	0.0	5.30	0.008	II	67.0(107.8)
DMG	33.7000	117.4000	05/15/1910	1547 0.0	0.0	6.00	0.014	IV	67.0(107.9)
DMG	33.7000	117.4000	05/13/1910	620 0.0	0.0	5.00	0.006	II	67.0(107.9)
DMG	33.7000	117.4000	04/11/1910	757 0.0	0.0	5.00	0.006	II	67.0(107.9)
GSP	34.1680	117.3370	06/28/1997	214525.1	9.0	4.20	0.003	I	67.2(108.2)

DMG	33.4000	119.4000	07/24/1947	1654 2.0	0.0	4.30	0.003	I	67.5(108.5)
DMG	34.9280	118.9700	01/15/1955	1 3 6.7	9.1	4.30	0.003	I	67.6(108.8)
DMG	34.2500	119.6540	06/29/1968	153242.8	14.6	4.10	0.003	I	67.7(108.9)
DMG	34.9030	119.0380	05/08/1939	248 5.3	10.0	4.50	0.004	I	67.7(108.9)
DMG	34.0330	117.3170	09/03/1935	647 0.0	0.0	4.50	0.004	I	67.7(109.0)
DMG	34.9000	119.0500	07/22/1952	143018.0	0.0	4.30	0.003	I	67.8(109.1)

EARTHQUAKE SEARCH RESULTS

Page 12

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	34.9320	118.9760	03/01/1963	02557.9	13.9	5.00	0.006	II	68.0(109.4)
GSP	34.9180	119.0200	12/24/2000	010421.9	14.0	4.40	0.004	I	68.2(109.7)
T-A	34.1700	117.3200	12/02/1859	2210 0.0	0.0	4.30	0.003	I	68.2(109.8)
DMG	35.0000	118.7330	08/23/1952	6 3 3.0	0.0	4.30	0.003	I	68.4(110.0)
DMG	35.0000	118.7330	04/29/1953	124745.0	0.0	4.70	0.005	II	68.4(110.0)
DMG	34.9500	118.9500	10/16/1952	1222 7.0	0.0	4.30	0.003	I	68.6(110.4)
GSP	34.1070	117.3040	01/09/2009	034946.3	14.0	4.50	0.004	I	68.7(110.5)
DMG	34.9450	118.9680	03/04/1963	201042.3	8.5	4.00	0.003	I	68.7(110.5)
DMG	34.9410	118.9870	11/15/1961	53855.5	10.7	5.00	0.006	II	68.8(110.8)
DMG	34.1000	117.3000	02/16/1931	1327 0.0	0.0	4.00	0.003	I	68.8(110.8)
MGI	34.1000	117.3000	12/27/1901	11 0 0.0	0.0	4.60	0.004	I	68.8(110.8)
MGI	34.1000	117.3000	07/15/1905	2041 0.0	0.0	5.30	0.008	II	68.8(110.8)
MGI	34.1000	117.3000	11/22/1911	257 0.0	0.0	4.00	0.003	I	68.8(110.8)
DMG	34.1180	119.7020	07/05/1968	04517.2	5.9	5.20	0.007	II	69.0(111.0)
DMG	34.2120	119.6910	06/26/1968	181111.2	13.9	4.00	0.003	I	69.2(111.4)
MGI	34.2000	117.3000	04/13/1913	1045 0.0	0.0	4.00	0.003	-	69.6(112.1)
DMG	34.9670	118.9500	11/27/1952	153641.0	0.0	4.00	0.003	-	69.7(112.1)
DMG	34.9670	118.9500	07/30/1952	11 255.0	0.0	4.10	0.003	I	69.7(112.1)
DMG	33.0380	118.7340	09/13/1937	221439.5	10.0	4.00	0.003	-	69.7(112.1)
DMG	35.0000	118.8330	07/23/1952	75319.0	0.0	5.40	0.008	III	69.7(112.2)
DMG	35.0000	118.8330	07/23/1952	181351.0	0.0	5.20	0.007	II	69.7(112.2)
DMG	35.0000	118.8330	12/01/1952	52610.0	0.0	4.40	0.004	I	69.7(112.2)
DMG	34.0000	117.2830	11/07/1939	1852 8.4	0.0	4.70	0.005	II	69.7(112.2)
DMG	34.9830	118.9000	07/24/1952	95032.0	0.0	4.30	0.003	I	69.7(112.2)
DMG	34.9830	118.9000	03/23/1953	17 637.0	0.0	4.00	0.003	-	69.7(112.2)
DMG	34.0720	119.7230	07/05/1968	23614.1	4.3	4.00	0.003	-	70.0(112.6)
DMG	34.9500	119.0170	11/11/1952	181225.0	0.0	4.10	0.003	I	70.1(112.8)
DMG	34.8410	119.2400	01/11/1958	23 847.4	10.8	4.00	0.003	-	70.1(112.9)
DMG	34.2530	119.6980	06/29/1968	191221.3	9.5	4.20	0.003	I	70.2(112.9)
DMG	34.9330	119.0670	02/10/1954	235838.0	0.0	4.50	0.004	I	70.3(113.1)

DMG	33.9960	117.2700	02/17/1952	123658.3	16.0	4.50	0.004	I	70.5(113.4)
DMG	34.9220	119.1030	01/09/1963	6 4 3.8	8.7	4.00	0.003	-	70.6(113.6)
DMG	34.9670	119.0000	09/02/1952	204556.0	0.0	4.70	0.004	I	70.8(113.9)
GSP	34.0470	117.2550	02/21/2000	134943.1	15.0	4.50	0.004	I	71.3(114.7)
DMG	34.1920	119.7330	07/05/1968	036 6.4	15.6	4.00	0.003	-	71.3(114.8)
DMG	34.3170	119.7000	10/21/1953	16 238.0	0.0	4.00	0.003	-	71.4(114.8)
DMG	34.9830	118.9830	05/23/1954	235243.0	0.0	5.10	0.006	II	71.4(114.9)
GSP	33.8375	119.7258	04/05/2018	192916.5	9.9	5.31	0.007	II	71.4(114.9)
DMG	35.0630	118.4230	08/26/1952	205640.6	-0.8	4.40	0.003	I	71.6(115.2)
DMG	34.0000	117.2500	07/23/1923	73026.0	0.0	6.25	0.015	IV	71.6(115.2)
DMG	34.0000	117.2500	11/01/1932	445 0.0	0.0	4.00	0.002	-	71.6(115.2)
T-A	34.0800	117.2500	10/07/1869	0 0 0.0	0.0	4.30	0.003	I	71.6(115.3)
PAS	34.3470	119.6960	08/13/1978	225453.4	12.8	5.10	0.006	II	71.7(115.4)
PAS	34.0230	117.2450	10/02/1985	234412.4	15.2	4.80	0.005	II	71.8(115.6)
DMG	35.0670	118.6170	07/23/1952	235136.0	0.0	4.00	0.002	-	72.0(115.9)
DMG	35.0330	118.8500	10/07/1953	145921.0	0.0	4.90	0.005	II	72.2(116.1)
DMG	34.1760	119.7540	07/07/1968	143330.8	12.8	4.50	0.004	I	72.4(116.5)
DMG	34.9830	119.0330	07/21/1952	235328.0	0.0	4.50	0.004	I	72.5(116.7)
GSP	34.0240	117.2300	03/11/1998	121851.8	14.0	4.50	0.004	I	72.7(117.0)
DMG	34.0430	117.2280	04/03/1939	25044.7	10.0	4.00	0.002	-	72.8(117.2)
DMG	35.0000	119.0000	07/21/1952	1212 0.0	0.0	4.60	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1210 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/23/1952	043 8.0	0.0	4.40	0.003	I	72.9(117.2)

EARTHQUAKE SEARCH RESULTS

Page 13

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	35.0000	119.0000	07/21/1952	1451 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1336 0.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	12 531.0	0.0	6.40	0.017	IV	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1317 0.0	0.0	4.00	0.002	-	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1359 0.0	0.0	4.60	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1313 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1417 0.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	01/25/1919	2229 0.0	0.0	4.00	0.002	-	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	12 7 0.0	0.0	4.70	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	08/10/1952	194424.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1218 0.0	0.0	4.40	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/22/1952	191024.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/22/1952	175236.0	0.0	4.10	0.003	I	72.9(117.2)

DMG	35.0000	119.0000	03/13/1929	228 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1638 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/25/1952	0 3 0.0	0.0	4.00	0.002	-	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1442 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1240 0.0	0.0	4.90	0.005	II	72.9(117.2)
DMG	35.0000	119.0000	02/16/1919	1557 0.0	0.0	5.00	0.005	II	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	12 6 0.0	0.0	4.80	0.005	II	72.9(117.2)
DMG	35.0000	119.0000	07/22/1952	133143.0	0.0	4.80	0.005	II	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1228 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1542 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	18 0 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1617 0.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1553 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	132512.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	13 8 0.0	0.0	4.50	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1239 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1225 0.0	0.0	4.70	0.004	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1259 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1536 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/22/1952	82122.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	14 6 0.0	0.0	4.20	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1415 0.0	0.0	4.40	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1311 0.0	0.0	4.10	0.003	I	72.9(117.2)
DMG	35.0000	119.0000	07/21/1952	1222 0.0	0.0	4.90	0.005	II	72.9(117.2)
DMG	35.0830	118.5830	07/22/1952	81624.0	0.0	4.40	0.003	I	73.0(117.4)
DMG	35.0830	118.5830	08/04/1952	535 0.0	0.0	4.00	0.002	-	73.0(117.4)
MGI	34.4000	119.7000	08/09/1926	412 0.0	0.0	4.00	0.002	-	73.1(117.7)
MGI	34.4000	119.7000	03/25/1806	8 0 0.0	0.0	5.00	0.005	II	73.1(117.7)
MGI	34.4000	119.7000	07/06/1926	1745 0.0	0.0	4.00	0.002	-	73.1(117.7)
MGI	34.4000	119.7000	06/24/1926	1530 0.0	0.0	4.00	0.002	-	73.1(117.7)
MGI	34.4000	119.7000	08/26/1927	1240 0.0	0.0	4.00	0.002	-	73.1(117.7)
DMG	35.0000	119.0170	01/12/1954	233349.0	0.0	5.90	0.011	III	73.2(117.9)
DMG	35.0000	119.0170	05/25/1953	324 1.0	0.0	4.80	0.005	II	73.2(117.9)
DMG	35.0000	119.0170	07/21/1952	115214.0	0.0	7.70	0.047	VI	73.2(117.9)
DMG	35.0670	118.7670	07/22/1952	21 211.0	0.0	4.20	0.003	I	73.3(118.0)
DMG	35.0330	118.9170	07/23/1952	211658.0	0.0	4.10	0.003	-	73.3(118.0)
DMG	35.0170	118.9830	08/17/1952	9 9 7.0	0.0	4.10	0.003	-	73.6(118.4)
DMG	35.0330	118.9330	07/22/1952	223133.0	0.0	4.70	0.004	I	73.6(118.4)
DMG	35.0000	119.0330	07/21/1952	1158 0.0	0.0	4.60	0.004	I	73.6(118.5)
DMG	35.0000	119.0330	07/21/1952	1159 0.0	0.0	4.50	0.004	I	73.6(118.5)

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	35.0000	119.0330	07/21/1952	1157 0.0	0.0	4.50	0.004	I	73.6(118.5)
DMG	35.0000	119.0330	07/21/1952	1155 0.0	0.0	4.50	0.004	I	73.6(118.5)
DMG	35.0000	119.0330	07/21/1952	12 2 0.0	0.0	5.60	0.009	III	73.6(118.5)
DMG	35.0000	119.0330	07/21/1952	1154 0.0	0.0	4.50	0.004	I	73.6(118.5)
PAS	35.0950	118.5190	06/22/1981	45747.3	5.0	4.00	0.002	-	73.7(118.5)
DMG	35.0000	119.0500	09/12/1952	103525.0	0.0	4.50	0.004	I	74.0(119.1)
DMG	35.0500	118.9000	09/25/1952	162136.0	0.0	4.10	0.003	-	74.1(119.3)
DMG	35.0830	118.7500	07/26/1952	18 244.0	0.0	4.00	0.002	-	74.2(119.4)
DMG	35.0830	118.7500	07/26/1952	15 831.0	0.0	4.40	0.003	I	74.2(119.4)
DMG	35.0830	118.7500	07/22/1952	84734.0	0.0	4.70	0.004	I	74.2(119.4)
T-A	34.5000	119.6700	06/25/1855	22 0 0.0	0.0	4.30	0.003	I	74.2(119.5)
T-A	34.5000	119.6700	05/31/1854	1250 0.0	0.0	4.30	0.003	I	74.2(119.5)
T-A	34.5000	119.6700	03/14/1857	23 0 0.0	0.0	4.30	0.003	I	74.2(119.5)
T-A	34.5000	119.6700	07/09/1885	0 0 0.0	0.0	4.30	0.003	I	74.2(119.5)
T-A	34.5000	119.6700	02/09/1902	15 0 0.0	0.0	4.30	0.003	I	74.2(119.5)
T-A	34.5000	119.6700	06/01/1893	12 0 0.0	0.0	5.00	0.005	II	74.2(119.5)
DMG	35.1000	118.6170	09/26/1952	202120.0	0.0	4.00	0.002	-	74.3(119.5)
MGI	34.1000	117.2000	04/23/1923	2113 0.0	0.0	4.00	0.002	-	74.6(120.0)
GSP	32.9750	118.7910	03/04/1992	190627.0	6.0	4.20	0.003	I	74.6(120.1)
GSP	35.0980	118.3060	12/31/1995	214823.1	7.0	4.00	0.002	-	74.7(120.2)
DMG	35.0000	119.0830	11/07/1952	85535.0	0.0	4.60	0.004	I	74.8(120.4)
DMG	34.3250	119.7610	08/09/1956	0 849.2	4.0	4.00	0.002	-	74.8(120.5)
DMG	35.0670	118.8830	08/17/1952	21 442.0	0.0	4.30	0.003	I	74.9(120.6)
DMG	35.0670	118.8830	08/14/1952	114146.0	0.0	4.20	0.003	I	74.9(120.6)
DMG	35.0330	119.0000	07/22/1952	101939.0	0.0	4.10	0.003	-	75.0(120.6)
DMG	33.9000	117.2000	12/19/1880	0 0 0.0	0.0	6.00	0.012	III	75.0(120.7)
DMG	35.0500	118.9500	11/14/1952	2334 1.4	0.0	4.00	0.002	-	75.0(120.7)
DMG	35.0500	118.9500	08/17/1952	614 4.0	0.0	4.00	0.002	-	75.0(120.7)
DMG	34.4900	119.6910	09/16/1962	181235.2	13.3	4.00	0.002	-	75.0(120.8)
DMG	35.0170	119.0500	08/05/1953	122059.0	0.0	4.30	0.003	I	75.1(120.8)
DMG	35.1170	118.4810	05/01/1953	64820.9	2.4	4.10	0.003	-	75.2(121.0)
DMG	34.2000	119.8000	12/21/1812	19 0 0.0	0.0	7.00	0.026	V	75.2(121.0)
GSP	33.1660	119.3020	11/15/2009	224527.1	6.0	4.30	0.003	I	75.3(121.2)
PAS	35.0000	119.1030	05/13/1975	02135.6	19.1	4.50	0.003	I	75.3(121.2)
GSP	34.0050	117.1800	02/13/2010	213906.6	8.0	4.10	0.003	-	75.6(121.6)
DMG	34.3500	119.7670	11/10/1940	102510.0	0.0	4.00	0.002	-	75.7(121.8)
DMG	33.2670	119.4500	11/18/1947	2159 3.0	0.0	5.00	0.005	II	75.8(121.9)
MGI	34.5000	119.7000	07/29/1925	14 0 0.0	0.0	4.00	0.002	-	75.8(122.0)
MGI	34.5000	119.7000	08/26/1919	1212 0.0	0.0	4.00	0.002	-	75.8(122.0)
MGI	34.5000	119.7000	08/26/1919	1457 0.0	0.0	4.00	0.002	-	75.8(122.0)
PAS	35.0460	119.0010	06/05/1975	144645.3	9.0	4.10	0.002	-	75.8(122.0)
DMG	35.0450	119.0040	03/23/1956	212327.1	12.1	4.30	0.003	I	75.8(122.0)
DMG	35.0670	118.9330	07/23/1952	223220.0	0.0	4.10	0.002	-	75.8(122.0)
PAS	33.0330	117.9440	02/22/1983	21830.4	10.0	4.30	0.003	I	75.8(122.0)
GSP	35.0430	119.0130	09/22/2005	202448.6	11.0	4.70	0.004	I	75.9(122.1)
DMG	35.0330	119.0500	07/27/1952	71611.0	0.0	4.10	0.002	-	76.1(122.4)

DMG	35.0330	119.0500	08/18/1952	44010.0	0.0	4.70	0.004	I	76.1(122.4)
DMG	35.0330	119.0500	08/07/1952	163151.0	0.0	4.90	0.005	II	76.1(122.4)
GSP	33.6740	119.7600	07/24/2005	125942.9	6.0	4.10	0.002	-	76.2(122.7)
DMG	35.1330	118.5170	07/22/1952	141 2.0	0.0	4.50	0.003	I	76.3(122.7)
DMG	35.1330	118.5170	07/28/1952	54554.0	0.0	4.20	0.003	I	76.3(122.7)
DMG	35.1330	118.5170	07/23/1952	152524.0	0.0	4.00	0.002	-	76.3(122.7)
DMG	35.1330	118.5170	08/14/1952	72822.0	0.0	4.10	0.002	-	76.3(122.7)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
MGI	34.3000	119.8000	07/03/1925	1638 0.0	0.0	5.30	0.006	II	76.6(123.2)
MGI	34.3000	119.8000	07/03/1925	1821 0.0	0.0	5.30	0.006	II	76.6(123.2)
DMG	34.3000	119.8000	06/29/1925	144216.0	0.0	6.25	0.014	IV	76.6(123.2)
DMG	35.0670	118.9830	08/04/1952	194750.0	0.0	4.00	0.002	-	76.8(123.6)
DMG	35.1330	118.7000	09/02/1952	124132.0	0.0	4.60	0.004	I	77.1(124.1)
DMG	35.0330	119.1000	01/13/1954	14531.0	0.0	4.40	0.003	I	77.3(124.4)
DMG	35.0330	119.1000	09/02/1953	152756.0	0.0	4.00	0.002	-	77.3(124.4)
DMG	35.0330	119.1000	02/07/1954	0 953.0	0.0	4.40	0.003	I	77.3(124.4)
DMG	35.0330	119.1000	01/12/1954	234037.0	0.0	4.10	0.002	-	77.3(124.4)
PAS	35.0180	119.1410	11/10/1981	223435.5	3.1	4.50	0.003	I	77.4(124.6)
DMG	35.1330	118.7670	07/21/1952	194122.0	0.0	5.50	0.007	II	77.8(125.1)
DMG	35.1330	118.7670	07/25/1952	143442.0	0.0	4.40	0.003	I	77.8(125.1)
DMG	35.1500	118.6330	01/27/1954	141948.0	0.0	5.00	0.005	II	77.8(125.2)
DMG	35.0670	119.0330	07/23/1952	175329.0	0.0	4.10	0.002	-	77.8(125.3)
DMG	35.0670	119.0330	07/27/1952	113438.0	0.0	4.10	0.002	-	77.8(125.3)
DMG	33.7380	117.1870	04/27/1962	91232.1	5.7	4.10	0.002	-	77.9(125.4)
DMG	34.4710	119.7570	11/16/1958	934 6.1	15.2	4.00	0.002	-	77.9(125.4)
PAS	35.0120	119.1790	11/10/1981	2237 5.0	9.4	4.20	0.003	-	78.1(125.7)
DMG	35.1500	118.6830	08/13/1952	173925.0	0.0	4.70	0.004	I	78.1(125.7)
DMG	35.0660	119.0490	01/24/1974	5 2 0.8	6.4	4.30	0.003	I	78.1(125.7)
PAS	35.0350	119.1370	06/16/1978	42131.6	1.8	4.30	0.003	I	78.4(126.1)
GSB	35.0380	119.1300	02/14/2004	124311.4	12.0	4.60	0.004	I	78.4(126.1)
MGI	34.4000	119.8000	09/09/1929	515 0.0	0.0	4.60	0.004	I	78.5(126.3)
DMG	35.1000	118.9670	08/25/1952	62026.0	0.0	4.70	0.004	I	78.6(126.5)
DMG	35.0670	119.0670	02/24/1954	223022.0	0.0	4.50	0.003	I	78.6(126.5)
PAS	34.4020	119.8020	03/10/1986	153316.3	18.0	4.10	0.002	-	78.7(126.6)
DMG	34.3330	119.8330	06/26/1933	62752.0	0.0	4.30	0.003	I	79.0(127.1)
DMG	34.3330	119.8330	06/26/1933	62542.0	0.0	4.30	0.003	I	79.0(127.1)
GSB	35.0270	119.1780	04/16/2005	191813.0	10.0	4.60	0.004	I	79.0(127.1)

DMG	35.0500	119.1330	05/23/1953	75255.0	0.0	4.20	0.003	-	79.2(127.4)
DMG	35.0500	119.1330	08/06/1953	1120 4.0	0.0	4.40	0.003	I	79.2(127.4)
DMG	35.1000	119.0000	07/22/1952	14 511.0	0.0	4.30	0.003	I	79.3(127.5)
DMG	35.1000	119.0000	07/24/1952	311 7.0	0.0	4.10	0.002	-	79.3(127.5)
GSP	33.1950	119.4490	01/03/2012	141856.1	18.0	4.10	0.002	-	79.3(127.6)
GSP	35.0310	119.1800	05/06/2005	022909.5	11.0	4.10	0.002	-	79.3(127.6)
DMG	35.1830	118.6000	07/26/1952	2241 3.0	0.0	4.60	0.003	I	79.9(128.6)
DMG	35.1830	118.6000	07/29/1952	154950.0	0.0	4.90	0.004	I	79.9(128.6)
DMG	35.1830	118.6000	07/26/1952	63850.0	0.0	4.00	0.002	-	79.9(128.6)
T-A	34.4200	119.8200	00/00/1862	0 0 0.0	0.0	5.70	0.008	III	80.0(128.8)
DMG	35.0500	119.1670	12/14/1950	135623.0	0.0	4.40	0.003	I	80.1(128.9)
USG	33.0170	117.8170	07/14/1986	11112.6	10.0	4.12	0.002	-	80.1(129.0)
USG	33.0170	117.8170	07/16/1986	1247 3.7	10.0	4.11	0.002	-	80.1(129.0)
DMG	35.1830	118.6500	07/21/1952	151358.0	0.0	5.10	0.005	II	80.2(129.0)
DMG	35.1940	118.4650	07/22/1952	19 858.2	3.7	4.30	0.003	I	80.5(129.6)
GSP	32.8667	118.6535	11/10/2014	084242.9	5.1	4.11	0.002	-	80.7(129.8)
DMG	35.1990	118.5310	09/01/1961	165148.9	4.5	4.00	0.002	-	80.8(130.1)
GSP	35.0220	119.2530	05/08/2010	192306.6	15.0	4.30	0.003	I	80.9(130.1)
PAS	32.9900	117.8490	07/13/1986	14 133.0	12.0	4.60	0.003	I	80.9(130.2)
DMG	34.2000	117.1000	09/20/1907	154 0.0	0.0	6.00	0.011	III	80.9(130.2)
DMG	35.1000	119.0830	07/24/1946	019 8.0	0.0	4.00	0.002	-	81.1(130.5)
DMG	35.1000	119.0830	12/06/1934	743 0.0	0.0	4.00	0.002	-	81.1(130.5)
GSP	34.1920	117.0950	04/06/1994	190104.1	7.0	4.80	0.004	I	81.1(130.6)
DMG	35.2000	118.6330	07/22/1952	321 5.0	0.0	4.40	0.003	I	81.2(130.7)

EARTHQUAKE SEARCH RESULTS

Page 16

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
PAS	32.9860	117.8440	10/01/1986	201218.6	6.0	4.00	0.002	-	81.3(130.8)
DMG	32.8670	118.2500	02/13/1952	151337.0	0.0	4.70	0.004	I	81.5(131.1)
PAS	32.9710	117.8700	07/13/1986	1347 8.2	6.0	5.30	0.006	II	81.5(131.2)
DMG	33.1500	119.4500	06/17/1934	243 0.0	0.0	4.00	0.002	-	81.6(131.3)
DMG	33.1500	119.4500	01/05/1940	62052.0	0.0	4.00	0.002	-	81.6(131.3)
GSP	33.9530	117.0760	09/14/2011	144451.0	16.0	4.10	0.002	-	81.7(131.5)
DMG	35.0500	119.2330	08/19/1952	191226.0	0.0	4.50	0.003	I	81.9(131.8)
GSP	32.9850	117.8180	06/21/1995	211736.2	6.0	4.30	0.003	-	82.1(132.0)
DMG	35.2170	118.6670	09/14/1952	204324.0	0.0	4.10	0.002	-	82.6(132.9)
DMG	35.2290	118.5130	06/28/1957	1132 0.8	1.6	4.10	0.002	-	82.9(133.4)
GSP	32.9000	118.0070	06/20/2009	010030.6	14.0	4.10	0.002	-	82.9(133.4)
DMG	34.0170	117.0500	02/19/1940	12 655.7	0.0	4.60	0.003	I	83.0(133.6)

GSP	32.9700	117.8100	04/04/1990	085439.3	6.0	4.00	0.002	-	83.2(133.9)
DMG	35.2330	118.5330	03/17/1953	161517.0	0.0	4.00	0.002	-	83.2(133.9)
DMG	35.2330	118.5330	07/24/1952	1735 6.0	0.0	4.20	0.002	-	83.2(133.9)
DMG	35.2330	118.5330	07/30/1952	144650.0	0.0	4.10	0.002	-	83.2(133.9)
DMG	35.2330	118.5330	07/21/1952	174244.0	0.0	5.10	0.005	II	83.2(133.9)
DMG	35.2330	118.5330	07/29/1952	173643.0	0.0	4.40	0.003	I	83.2(133.9)
DMG	35.2330	118.5330	07/22/1952	15 314.0	0.0	4.20	0.002	-	83.2(133.9)
DMG	35.2350	118.5480	03/03/1973	181449.5	8.0	4.00	0.002	-	83.4(134.1)
DMG	35.2330	118.6000	07/22/1952	91025.0	0.0	4.50	0.003	I	83.4(134.2)
DMG	35.2330	118.6000	01/10/1953	221738.0	0.0	4.00	0.002	-	83.4(134.2)
PAS	32.9700	117.8030	07/14/1986	03246.2	10.0	4.00	0.002	-	83.4(134.2)
DMG	33.7000	117.1000	06/11/1902	245 0.0	0.0	4.50	0.003	I	83.4(134.3)
DMG	35.1500	119.0500	11/11/1952	1722 8.0	0.0	4.20	0.002	-	83.5(134.4)
DMG	35.2390	118.5180	07/21/1952	2021 5.1	-2.0	4.20	0.002	-	83.6(134.5)
DMG	35.2410	118.5600	07/21/1952	1912 7.4	5.8	4.30	0.003	-	83.8(134.8)
DMG	35.0830	119.2330	03/03/1956	62412.0	0.0	4.20	0.002	-	83.9(135.0)
DMG	35.2170	118.8170	07/23/1952	1317 5.0	0.0	5.70	0.008	II	84.0(135.2)
DMG	35.2170	118.8170	12/15/1953	124436.0	0.0	4.60	0.003	I	84.0(135.2)
DMG	32.8170	118.3500	12/26/1951	04654.0	0.0	5.90	0.009	III	84.1(135.3)
PAS	32.9450	117.8310	07/29/1986	81741.8	10.0	4.10	0.002	-	84.1(135.4)
GSP	34.0540	117.0300	06/27/2005	221733.6	12.0	4.00	0.002	-	84.2(135.4)
DMG	35.2500	118.4830	07/23/1952	1330 4.0	0.0	4.40	0.003	I	84.4(135.7)
DMG	35.2500	118.4830	07/23/1952	93842.0	0.0	4.20	0.002	-	84.4(135.7)
PAS	32.9330	117.8410	07/29/1986	81741.6	10.0	4.30	0.003	-	84.6(136.2)
GSP	35.1490	119.1040	05/28/1993	044740.6	21.0	5.20	0.005	II	84.6(136.2)
PAS	32.9450	117.8060	09/07/1984	11 313.4	6.0	4.30	0.002	-	84.8(136.5)
GSP	33.9320	117.0230	01/16/2010	120325.7	13.0	4.30	0.002	-	84.9(136.6)
GSP	34.4062	119.9198	05/29/2013	143803.4	7.1	4.80	0.004	I	85.1(137.0)
GSP	35.2100	118.0660	07/11/1992	181416.2	10.0	5.70	0.008	II	85.2(137.2)
GSP	34.1800	117.0200	12/04/1991	081703.5	11.0	4.00	0.002	-	85.3(137.3)
GSP	34.0580	117.0100	06/16/2005	205326.0	11.0	4.90	0.004	I	85.3(137.3)
DMG	35.2670	118.4500	07/21/1952	191619.0	0.0	4.30	0.002	-	85.6(137.7)
DMG	34.0000	117.0000	06/30/1923	022 0.0	0.0	4.50	0.003	I	85.9(138.2)
GSP	34.2823	117.0267	07/05/2014	165934.1	7.3	4.58	0.003	I	86.0(138.4)
GSP	34.1200	116.9980	06/29/1992	144126.0	4.0	4.40	0.003	I	86.2(138.7)
GSP	34.0970	116.9960	12/05/1997	170438.9	4.0	4.10	0.002	-	86.2(138.7)
GSP	34.0850	116.9890	06/30/1992	214900.3	3.0	4.40	0.003	I	86.6(139.3)
PAS	32.9470	117.7360	01/15/1989	153955.2	6.0	4.20	0.002	-	86.7(139.5)
DMG	35.2830	118.5500	08/01/1952	31611.6	0.0	4.50	0.003	I	86.7(139.5)
DMG	35.2830	118.5500	07/23/1952	34928.0	0.0	4.70	0.003	I	86.7(139.5)
DMG	35.2830	118.5500	07/26/1952	922 6.0	0.0	4.30	0.002	-	86.7(139.5)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	35.2830	118.5500	07/22/1952	15151.0	0.0	4.40	0.003	I	86.7(139.5)
DMG	35.2830	118.5500	07/31/1952	41022.0	0.0	4.20	0.002	-	86.7(139.5)
DMG	35.2830	118.5500	07/23/1952	737 0.0	0.0	4.80	0.004	I	86.7(139.5)
DMG	35.1840	119.0990	07/01/1959	234923.4	9.0	4.70	0.003	I	86.7(139.6)
DMG	35.2830	118.5830	07/31/1952	1719 8.0	0.0	4.50	0.003	I	86.8(139.6)
DMG	34.0000	120.0170	04/01/1945	234342.0	0.0	5.40	0.006	II	86.8(139.7)
DMG	35.2890	118.4600	07/26/1952	1 221.3	10.8	4.20	0.002	-	87.1(140.1)
DMG	35.2900	118.4700	07/24/1952	12 757.6	14.1	4.10	0.002	-	87.1(140.2)
DMG	35.2890	118.4110	08/10/1952	122318.0	4.0	4.60	0.003	I	87.2(140.3)
DMG	34.1670	116.9830	10/16/1951	1241 5.0	0.0	4.00	0.002	-	87.3(140.5)
USG	32.7700	118.3340	06/16/1985	1027 0.7	5.0	4.14	0.002	-	87.4(140.7)
DMG	33.8000	117.0000	12/25/1899	1225 0.0	0.0	6.40	0.013	III	87.4(140.7)
DMG	35.2940	118.4010	08/13/1952	42940.6	14.5	4.60	0.003	I	87.6(140.9)
GSP	34.1570	116.9760	12/19/2007	121409.0	7.0	4.00	0.002	-	87.6(141.0)
GSP	34.0840	116.9680	10/02/2008	094149.3	12.0	4.10	0.002	-	87.7(141.2)
DMG	35.3000	118.5000	02/19/1953	812 6.0	0.0	4.40	0.003	-	87.8(141.3)
DMG	35.2990	118.4350	07/25/1952	20 6 6.1	-1.4	4.80	0.004	I	87.8(141.3)
PAS	34.1510	116.9720	11/20/1978	655 9.5	6.1	4.30	0.002	-	87.8(141.3)
DMG	35.3000	118.5330	09/02/1952	1638 9.0	0.0	4.00	0.002	-	87.8(141.3)
DMG	35.3000	118.5330	07/21/1952	182628.0	0.0	4.10	0.002	-	87.8(141.3)
DMG	35.3000	118.5330	07/30/1952	95929.0	0.0	4.00	0.002	-	87.8(141.3)
DMG	35.3000	118.5330	07/21/1952	182338.0	0.0	4.50	0.003	I	87.8(141.3)
DMG	35.3000	118.4320	07/23/1952	61045.9	14.5	4.20	0.002	-	87.9(141.4)
DMG	35.3030	118.4810	09/04/1952	18 649.1	5.8	4.40	0.003	-	88.0(141.6)
DMG	35.3030	118.4730	08/01/1952	213522.4	4.2	4.00	0.002	-	88.0(141.7)
DMG	33.7500	117.0000	06/06/1918	2232 0.0	0.0	5.00	0.004	I	88.1(141.8)
DMG	33.7500	117.0000	04/21/1918	223225.0	0.0	6.80	0.018	IV	88.1(141.8)
DMG	35.3050	118.5070	08/09/1952	10 732.1	-2.0	4.20	0.002	-	88.1(141.9)
DMG	34.3330	117.0000	02/27/1942	1 853.0	0.0	4.00	0.002	-	88.3(142.0)
DMG	35.3000	118.6670	08/13/1952	212548.0	0.0	4.10	0.002	-	88.3(142.1)
DMG	35.3080	118.5160	07/31/1952	19 515.4	7.3	4.00	0.002	-	88.4(142.2)
GSP	32.7600	118.2880	08/16/2001	180433.8	6.0	4.40	0.003	-	88.4(142.3)
DMG	35.1830	119.1740	06/04/1956	83319.3	14.3	4.00	0.002	-	88.4(142.3)
DMG	35.3110	118.4990	07/25/1952	1313 8.2	2.8	5.00	0.004	I	88.6(142.5)
DMG	35.3130	118.4890	10/20/1952	181443.6	14.0	4.30	0.002	-	88.7(142.7)
DMG	35.3140	118.4820	08/30/1952	45559.8	5.5	4.70	0.003	I	88.8(142.9)
DMG	35.3140	118.5300	07/26/1952	225856.1	6.8	4.30	0.002	-	88.8(142.9)
DMG	35.3150	118.5160	07/25/1952	194323.7	11.2	5.70	0.007	II	88.8(143.0)
PAS	34.1980	116.9590	04/01/1978	105227.4	8.0	4.00	0.002	-	88.9(143.1)
DMG	35.3160	118.5140	07/24/1952	14 525.9	5.4	4.30	0.002	-	88.9(143.1)
DMG	35.3160	118.4870	09/15/1952	44013.2	4.2	4.90	0.004	I	88.9(143.1)
DMG	34.1330	116.9500	06/10/1938	1440 0.0	0.0	4.00	0.002	-	89.0(143.2)
DMG	35.3170	118.4940	07/25/1952	19 944.6	5.5	5.70	0.007	II	89.0(143.2)
DMG	34.2670	116.9670	08/29/1943	35754.0	0.0	4.00	0.002	-	89.2(143.5)
DMG	34.2670	116.9670	08/29/1943	34513.0	0.0	5.50	0.006	II	89.2(143.5)

DMG	34.2670	116.9670	08/29/1943	51630.0	0.0	4.00	0.002	-	89.2(143.5)
DMG	35.3200	118.5180	07/27/1952	0 915.6	6.5	4.20	0.002	-	89.2(143.5)
DMG	35.3210	118.4940	02/11/1955	194431.5	14.7	4.50	0.003	I	89.3(143.6)
DMG	35.3210	118.5400	07/24/1952	141012.2	9.5	4.00	0.002	-	89.3(143.7)
DMG	35.3000	118.8000	12/23/1905	2223 0.0	0.0	5.00	0.004	I	89.4(143.9)
DMG	35.3240	118.4860	01/20/1953	81322.8	7.2	4.00	0.002	-	89.5(144.0)
GSP	35.3180	118.6540	01/25/2003	091610.2	5.0	4.50	0.003	I	89.5(144.0)
T-A	33.5000	117.0700	12/29/1880	7 0 0.0	0.0	4.30	0.002	-	89.8(144.6)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.4192	120.0022	05/17/2017	044225.3	2.3	4.06	0.002	-	89.9(144.6)
DMG	35.3300	118.5070	05/29/1968	22938.7	3.1	4.00	0.002	-	89.9(144.6)
GSP	32.7340	118.3340	08/16/2001	220628.1	25.0	4.20	0.002	-	89.9(144.6)
DMG	32.7500	118.2000	06/25/1939	149 0.0	0.0	4.50	0.003	I	89.9(144.7)
DMG	35.3330	118.5330	08/01/1952	103556.0	0.0	4.00	0.002	-	90.1(145.0)
DMG	35.3330	118.5670	08/08/1952	51718.0	0.0	4.00	0.002	-	90.2(145.1)
GSP	34.1210	116.9280	08/16/1998	133440.2	6.0	4.70	0.003	I	90.2(145.1)
DMG	35.3350	118.4740	07/23/1952	172224.0	6.6	4.50	0.003	I	90.2(145.2)
DMG	35.3330	118.6000	08/10/1952	6 118.0	0.0	4.00	0.002	-	90.3(145.2)
DMG	35.3330	118.6000	07/31/1952	12 9 9.0	0.0	5.80	0.008	II	90.3(145.2)
DMG	35.3330	118.6000	09/16/1952	142454.0	0.0	4.00	0.002	-	90.3(145.2)
DMG	35.3330	118.6000	07/23/1952	161838.0	0.0	4.50	0.003	I	90.3(145.2)
DMG	35.3330	118.6000	07/23/1952	164853.0	0.0	4.50	0.003	I	90.3(145.2)
DMG	35.3360	118.4720	07/23/1952	105413.5	19.7	4.10	0.002	-	90.3(145.3)
DMG	35.3370	118.5370	08/30/1952	45954.8	3.5	4.00	0.002	-	90.4(145.4)
DMG	35.3380	118.5230	08/06/1952	34624.2	12.6	4.30	0.002	-	90.4(145.5)
GSP	34.3950	120.0220	05/09/2004	085717.3	4.0	4.40	0.002	-	90.5(145.6)
DMG	35.3400	118.4730	07/24/1952	5 249.6	2.1	4.50	0.003	I	90.6(145.8)
GSP	34.1120	116.9200	10/01/1998	181816.0	4.0	4.70	0.003	I	90.6(145.8)
GSP	34.2900	116.9460	02/10/2001	210505.8	9.0	5.10	0.004	I	90.6(145.9)
GSP	34.2870	116.9420	02/11/2001	003916.0	8.0	4.20	0.002	-	90.8(146.2)
GSP	34.1780	116.9220	06/28/1992	170131.9	13.0	4.70	0.003	I	90.8(146.2)
DMG	35.3450	118.5070	07/23/1952	18 328.3	10.4	4.00	0.002	-	90.9(146.3)
DMG	34.1800	116.9200	01/16/1930	034 3.6	0.0	5.10	0.004	I	91.0(146.4)
DMG	34.1800	116.9200	01/16/1930	02433.9	0.0	5.20	0.005	II	91.0(146.4)
DMG	35.3460	118.4650	12/25/1952	55633.0	4.6	4.10	0.002	-	91.0(146.4)
DMG	34.4330	116.9830	04/18/1945	458 2.0	0.0	4.30	0.002	-	91.0(146.5)
DMG	35.3330	118.7330	08/05/1952	65010.0	0.0	4.40	0.002	-	91.0(146.5)

GSP	32.7280	118.2230	01/29/2009	084159.0	0.0	4.20	0.002	-	91.2(146.8)
DMG	35.3510	118.5270	08/11/1952	132149.2	-2.0	4.40	0.002	-	91.3(147.0)
GSP	33.6570	120.0330	04/21/2005	063619.0	6.0	4.00	0.002	-	91.5(147.3)
DMG	35.3560	118.5380	07/19/1955	2 425.5	6.4	4.10	0.002	-	91.7(147.6)
DMG	35.3600	118.4380	08/03/1952	15156.1	7.0	4.10	0.002	-	92.0(148.1)
DMG	35.3580	118.6160	08/24/1955	17 540.9	7.2	4.00	0.002	-	92.0(148.1)
GSP	34.2560	116.9120	06/28/1992	170557.5	8.0	4.60	0.003	I	92.1(148.3)
DMG	34.3200	116.9250	04/18/1968	174213.4	4.7	4.00	0.002	-	92.2(148.4)
MGI	34.2000	116.9000	10/10/1915	5 6 0.0	0.0	4.00	0.002	-	92.3(148.5)
MGI	35.3000	119.0000	09/04/1908	0 0 0.0	0.0	4.60	0.003	I	92.3(148.5)
MGI	35.3000	119.0000	01/08/1903	030 0.0	0.0	4.60	0.003	I	92.3(148.5)
GSP	33.9585	116.8883	01/06/2016	144234.9	16.7	4.39	0.002	-	92.4(148.7)
DMG	35.3670	118.5000	06/20/1953	231852.0	0.0	4.40	0.002	-	92.4(148.7)
DMG	32.7180	118.1720	04/28/1938	6 728.0	10.0	4.50	0.003	-	92.4(148.7)
DMG	35.3670	118.5330	07/23/1952	195134.0	0.0	4.20	0.002	-	92.4(148.8)
DMG	35.3670	118.5830	07/23/1952	65342.0	0.0	4.20	0.002	-	92.5(148.9)
DMG	35.3670	118.5830	07/23/1952	62628.0	0.0	4.00	0.002	-	92.5(148.9)
DMG	35.3670	118.5830	07/23/1952	03832.0	0.0	6.10	0.009	III	92.5(148.9)
DMG	35.3670	118.5830	07/23/1952	4 140.0	0.0	4.70	0.003	I	92.5(148.9)
DMG	35.3670	118.5830	07/23/1952	31923.0	0.0	5.00	0.004	I	92.5(148.9)
DMG	35.3670	118.5830	07/23/1952	04738.0	0.0	4.60	0.003	I	92.5(148.9)
DMG	35.3670	118.5830	07/27/1952	73539.0	0.0	4.20	0.002	-	92.5(148.9)
DMG	35.3670	118.5830	07/28/1952	154120.0	0.0	4.00	0.002	-	92.5(148.9)
DMG	35.3670	118.5830	09/16/1952	1521 8.0	0.0	4.30	0.002	-	92.5(148.9)
DMG	35.3170	118.9500	09/01/1952	1039 0.0	0.0	4.10	0.002	-	92.6(149.0)

EARTHQUAKE SEARCH RESULTS

Page 19

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
PAS	34.2460	116.9010	06/29/1979	55320.5	5.7	4.60	0.003	I	92.6(149.1)
DMG	34.1000	116.8830	10/24/1935	1451 0.0	0.0	4.50	0.003	-	92.7(149.1)
DMG	34.1000	116.8830	10/24/1935	1452 0.0	0.0	4.50	0.003	-	92.7(149.1)
DMG	34.1000	116.8830	10/24/1935	1527 0.0	0.0	4.00	0.002	-	92.7(149.1)
PAS	32.7560	117.9880	01/12/1975	212214.8	15.3	4.80	0.003	I	92.7(149.1)
PAS	34.2490	116.9000	06/30/1979	7 353.0	5.6	4.50	0.003	-	92.7(149.2)
DMG	33.9680	116.8820	06/27/1959	162211.1	13.8	4.00	0.002	-	92.7(149.2)
PAS	34.2430	116.8960	06/30/1979	03411.6	5.8	4.90	0.004	I	92.9(149.5)
DMG	33.7100	116.9250	09/23/1963	144152.6	16.5	5.00	0.004	I	93.0(149.6)
GSP	34.3620	116.9230	12/07/1992	033331.5	1.0	4.00	0.002	-	93.0(149.6)
MGI	33.8000	116.9000	12/18/1920	1726 0.0	0.0	4.00	0.002	-	93.1(149.7)

MGI	33.8000	116.9000	04/29/1918	2 0 0.0	0.0	4.00	0.002	-	93.1(149.7)
MGI	33.8000	116.9000	06/14/1918	1024 0.0	0.0	4.00	0.002	-	93.1(149.7)
MGI	33.8000	116.9000	04/23/1918	1415 0.0	0.0	4.00	0.002	-	93.1(149.7)
GSP	33.9660	116.8760	01/12/2010	023608.4	10.0	4.30	0.002	-	93.1(149.8)
DMG	32.8000	117.8330	01/24/1942	214148.0	0.0	4.00	0.002	-	93.1(149.9)
DMG	35.3330	118.9170	07/31/1952	195314.0	0.0	4.50	0.003	-	93.1(149.9)
DMG	35.3330	118.9170	08/22/1952	224124.0	0.0	5.80	0.007	II	93.1(149.9)
DMG	35.3330	118.9170	07/29/1952	195132.0	0.0	4.50	0.003	-	93.1(149.9)
DMG	35.3330	118.9170	08/07/1952	1919 7.0	0.0	4.20	0.002	-	93.1(149.9)
GSP	32.7260	118.0680	12/27/2000	002714.1	6.0	4.10	0.002	-	93.3(150.2)
MGI	34.3000	116.9000	12/01/1915	14 5 0.0	0.0	4.00	0.002	-	93.3(150.2)
DMG	34.3370	116.9090	11/30/1962	2351 5.5	7.0	4.30	0.002	-	93.4(150.3)
GSP	34.3770	116.9180	12/04/1992	052511.2	2.0	4.80	0.003	I	93.5(150.5)
GSP	34.3610	116.9130	12/04/1992	125942.1	0.0	4.20	0.002	-	93.5(150.5)
DMG	33.5000	117.0000	08/08/1925	1013 0.0	0.0	4.50	0.003	-	93.5(150.5)
DMG	35.3830	118.5670	07/23/1952	546 3.0	0.0	4.70	0.003	I	93.6(150.6)
DMG	35.3830	118.6000	09/05/1953	192436.0	0.0	4.10	0.002	-	93.7(150.8)
DMG	35.3790	118.6680	11/21/1955	205527.6	5.3	4.30	0.002	-	93.7(150.9)
GSP	34.3400	116.9000	11/27/1992	160057.5	1.0	5.30	0.005	II	93.9(151.1)
DMG	34.4000	116.9170	02/01/1942	16 334.0	0.0	4.50	0.003	-	94.0(151.2)
DMG	34.4000	116.9170	01/25/1942	215133.0	0.0	4.00	0.002	-	94.0(151.2)
DMG	34.4000	116.9170	02/01/1942	151828.0	0.0	4.50	0.003	-	94.0(151.2)
DMG	34.4000	116.9170	02/01/1942	151555.0	0.0	4.00	0.002	-	94.0(151.2)
PAS	35.3720	118.7740	12/15/1987	182346.1	3.2	4.10	0.002	-	94.1(151.4)
GSP	34.3640	116.9040	11/27/1992	183225.0	1.0	4.10	0.002	-	94.1(151.4)
PAS	32.7590	117.9060	10/18/1976	172753.1	13.8	4.20	0.002	-	94.1(151.4)
GSP	34.1372	116.8580	09/16/2015	161047.3	9.6	4.00	0.002	-	94.2(151.6)
T-A	35.3300	119.0000	01/04/1870	7 0 0.0	0.0	4.30	0.002	-	94.2(151.7)
GSP	35.3900	118.6230	09/29/2004	225454.2	3.0	5.00	0.004	I	94.3(151.7)
GSP	34.1410	116.8570	09/19/1997	223714.5	10.0	4.10	0.002	-	94.3(151.8)
DMG	35.3670	118.8330	03/17/1935	2026 0.0	0.0	4.00	0.002	-	94.3(151.8)
GSP	34.1950	116.8620	08/17/1992	204152.1	11.0	5.30	0.005	II	94.4(151.9)
GSP	34.1980	116.8620	08/18/1992	094640.7	12.0	4.20	0.002	-	94.4(151.9)
DMG	34.3240	116.8850	12/01/1962	03548.8	9.6	4.30	0.002	-	94.5(152.1)
GSP	34.1630	116.8550	06/28/1992	144321.0	6.0	5.30	0.005	II	94.5(152.1)
GSP	34.3690	116.8970	12/04/1992	020857.5	3.0	5.30	0.005	II	94.5(152.1)
DMG	35.3950	118.6200	08/08/1955	32150.5	4.1	4.70	0.003	I	94.6(152.2)
PAS	34.6610	119.9730	05/07/1984	193232.8	9.9	4.20	0.002	-	94.6(152.3)
DMG	33.9500	116.8500	09/28/1946	719 9.0	0.0	5.00	0.004	I	94.6(152.3)
DMG	34.3120	116.8790	01/31/1972	155 4.2	8.0	4.00	0.002	-	94.7(152.4)
GSP	35.3700	118.8500	12/18/1990	165643.0	6.0	4.20	0.002	-	94.7(152.5)
DMG	34.3330	116.8830	10/14/1943	142844.0	0.0	4.50	0.003	-	94.8(152.5)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	35.4000	118.5830	07/24/1952	114756.0	0.0	4.40	0.002	-	94.8(152.6)
DMG	35.4000	118.5830	07/25/1952	7 351.0	0.0	4.10	0.002	-	94.8(152.6)
DMG	35.3670	118.8830	09/12/1953	64116.0	0.0	4.10	0.002	-	94.9(152.8)
DMG	35.4000	118.6330	10/02/1952	231021.0	0.0	4.20	0.002	-	95.0(152.9)
DMG	35.3500	118.9670	02/04/1954	204841.0	0.0	4.00	0.002	-	95.0(152.9)
GSP	32.6850	118.1380	06/20/1997	053855.0	6.0	4.20	0.002	-	95.1(153.0)
DMG	34.3250	116.8750	12/02/1962	04138.4	6.7	4.40	0.002	-	95.1(153.0)
PAS	33.5350	120.0490	01/12/1983	1719 0.6	5.0	4.20	0.002	-	95.2(153.1)
GSP	34.3700	116.8800	11/29/1992	142120.5	3.0	4.00	0.002	-	95.5(153.7)
GSP	34.2320	116.8460	07/10/1992	012940.0	0.0	4.20	0.002	-	95.6(153.8)
DMG	35.3830	118.8500	07/29/1952	7 347.0	0.0	6.10	0.009	III	95.6(153.9)
DMG	35.3830	118.8500	10/13/1952	222035.0	0.0	4.00	0.002	-	95.6(153.9)
DMG	34.3250	116.8650	10/29/1962	24253.9	8.6	4.80	0.003	I	95.6(153.9)
GSP	34.2250	116.8440	07/09/1992	023435.0	0.0	4.10	0.002	-	95.6(153.9)
GSP	32.6810	118.1090	06/20/1997	043540.5	6.0	4.70	0.003	I	95.7(154.0)
DMG	34.3500	116.8670	10/15/1943	1650 1.0	0.0	4.50	0.002	-	95.9(154.3)
GSP	34.3240	116.8580	02/22/2003	141608.4	4.0	4.10	0.002	-	96.0(154.5)
GSP	34.3260	116.8570	02/22/2003	122513.6	9.0	4.00	0.002	-	96.1(154.7)
GSP	34.1630	116.8270	06/28/1992	150451.5	12.0	4.40	0.002	-	96.1(154.7)
GSP	34.2390	116.8370	07/09/1992	014357.6	0.0	5.30	0.005	II	96.2(154.8)
GSP	34.3110	116.8510	02/22/2003	122133.1	4.0	4.30	0.002	-	96.2(154.9)
DMG	32.6800	118.0770	10/28/1973	22 0 2.7	8.0	4.50	0.002	-	96.2(154.9)
GSP	34.3100	116.8500	02/22/2003	193345.8	3.0	4.50	0.002	-	96.3(154.9)
PAS	35.2250	117.6290	05/02/1975	18 323.1	10.0	4.20	0.002	-	96.3(155.0)
GSG	34.3100	116.8480	02/22/2003	121910.6	1.0	5.20	0.004	I	96.4(155.1)
DMG	35.4000	118.8170	07/29/1952	8 146.0	0.0	5.10	0.004	I	96.4(155.1)
GSP	34.3200	116.8500	10/27/1998	154017.1	4.0	4.10	0.002	-	96.4(155.2)
GSN	34.2030	116.8270	06/28/1992	150530.7	5.0	6.70	0.014	IV	96.4(155.2)
GSP	34.3110	116.8470	02/22/2003	122015.6	4.0	4.00	0.002	-	96.5(155.2)
GSP	34.3040	116.8430	02/27/2003	050021.7	4.0	4.00	0.002	-	96.6(155.4)
GSP	34.3220	116.8460	09/20/1999	070249.2	2.0	4.20	0.002	-	96.7(155.6)
GSP	34.3150	116.8440	02/25/2003	040304.8	2.0	4.60	0.003	I	96.7(155.6)
GSP	34.3230	116.8440	10/27/1998	010840.7	5.0	4.90	0.003	I	96.8(155.8)
PAS	32.7140	117.9100	10/18/1976	172652.6	15.1	4.20	0.002	-	96.9(156.0)
DMG	34.3070	116.8350	08/28/1950	194526.4	11.7	4.20	0.002	-	97.1(156.2)
DMG	34.7000	117.0000	07/16/1916	1230 0.0	0.0	4.00	0.002	-	97.3(156.6)
DMG	34.7000	117.0000	07/16/1916	1150 0.0	0.0	4.50	0.002	-	97.3(156.6)
GSP	34.3540	116.8430	11/13/2004	173916.9	9.0	4.20	0.002	-	97.3(156.6)
DMG	35.4320	118.6640	09/30/1964	175125.8	7.4	4.00	0.002	-	97.4(156.7)
DMG	34.1000	116.8000	10/24/1935	1448 7.6	0.0	5.10	0.004	I	97.4(156.7)
DMG	33.9670	116.8000	09/07/1945	153424.0	0.0	4.30	0.002	-	97.4(156.8)
GSP	34.3290	116.8320	12/03/2005	074934.6	5.0	4.10	0.002	-	97.5(157.0)
GSP	34.2370	116.8110	06/28/1992	125730.8	10.0	4.00	0.002	-	97.6(157.1)
DMG	35.4330	118.7000	05/01/1954	22 439.0	0.0	4.20	0.002	-	97.6(157.1)

GSP	34.1830	116.8020	06/28/1992	192637.6	1.0	4.00	0.002	-	97.7(157.2)
DMG	35.4400	118.3470	01/02/1964	194841.0	6.3	4.20	0.002	-	97.9(157.5)
DMG	33.5000	116.9170	11/04/1935	355 0.0	0.0	4.50	0.002	-	97.9(157.6)
DMG	34.4170	116.8500	02/11/1932	231120.0	0.0	4.00	0.002	-	98.0(157.7)
PAS	33.7010	116.8370	08/22/1979	2 136.3	5.0	4.10	0.002	-	98.0(157.7)
DMG	34.0290	116.7870	04/30/1954	03623.9	11.1	4.20	0.002	-	98.1(157.8)
DMG	32.7170	117.8330	11/06/1950	205546.0	0.0	4.40	0.002	-	98.4(158.3)
PAS	34.3220	116.8150	08/29/1985	759 8.7	6.1	4.10	0.002	-	98.4(158.3)
DMG	35.4540	118.4760	11/23/1953	2039 0.9	5.9	4.40	0.002	-	98.4(158.4)

EARTHQUAKE SEARCH RESULTS

Page 21

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	35.4530	118.4310	05/06/1997	191253.8	6.0	4.50	0.002	-	98.4(158.4)
DMG	34.2290	116.7950	05/11/1956	163050.5	13.3	4.70	0.003	I	98.5(158.4)
GSP	34.0160	116.7798	05/08/2018	114934.0	12.9	4.49	0.002	-	98.5(158.5)
DMG	35.4540	118.6050	02/07/1964	22 750.3	-2.0	4.40	0.002	-	98.6(158.7)
GSP	34.2980	116.8040	07/05/1992	200303.1	3.0	4.00	0.002	-	98.7(158.8)
GSP	34.0140	116.7750	10/18/2005	040841.5	16.0	4.10	0.002	-	98.8(158.9)
GSP	34.0120	116.7750	10/18/2005	073103.5	18.0	4.40	0.002	-	98.8(158.9)
DMG	33.9760	116.7750	10/17/1965	94519.0	17.0	4.90	0.003	I	98.8(159.1)
DMG	35.2000	119.5000	06/09/1928	822 0.0	0.0	4.00	0.002	-	98.8(159.1)
MGI	35.2000	119.5000	12/01/1920	130 0.0	0.0	4.60	0.003	-	98.8(159.1)
GSP	32.6260	118.1510	06/20/1997	080413.6	6.0	4.60	0.003	-	98.9(159.2)
DMG	34.0140	116.7710	06/10/1944	111150.5	10.0	4.50	0.002	-	99.0(159.3)
DMG	33.0000	117.3000	11/22/1800	2130 0.0	0.0	6.50	0.012	III	99.1(159.4)
DMG	35.3530	117.8260	07/03/1944	53823.5	-2.0	4.70	0.003	I	99.2(159.6)
DMG	34.3170	116.8000	08/12/1950	21717.0	0.0	4.30	0.002	-	99.2(159.6)
DMG	33.9730	116.7690	06/10/1944	111531.9	10.0	4.00	0.002	-	99.2(159.6)
DMG	34.4360	116.8340	07/14/1973	8 020.1	8.0	4.80	0.003	I	99.2(159.7)
DMG	35.1060	117.3460	10/11/1966	165912.9	6.5	4.40	0.002	-	99.2(159.7)
GSP	35.4663	118.5210	04/19/2014	121513.0	-0.8	4.24	0.002	-	99.3(159.8)
DMG	35.3330	119.2500	01/20/1941	135816.0	0.0	4.00	0.002	-	99.6(160.3)
DMG	35.4650	118.6680	02/07/1964	221052.0	-0.5	4.20	0.002	-	99.6(160.4)
GSP	34.2190	116.7710	07/21/1992	211029.0	1.0	4.10	0.002	-	99.7(160.5)
DMG	34.2990	116.7840	03/18/1956	24217.3	6.3	4.40	0.002	-	99.8(160.7)
GSP	35.4730	118.4250	05/01/2008	081143.2	6.0	4.40	0.002	-	99.8(160.7)
PAS	35.2700	119.4020	09/26/1980	131841.1	5.0	4.10	0.002	-	99.9(160.7)
PAS	35.2970	119.3460	05/06/1985	231433.0	24.4	4.40	0.002	-	99.9(160.7)
GSP	34.2670	116.7750	12/02/2000	082807.4	3.0	4.10	0.002	-	100.0(160.9)

****

-END OF SEARCH- 1087 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2018

LENGTH OF SEARCH TIME: 219 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 1.9 MILES (3.1 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.7

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.231 g

COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:

a-value= 3.941
b-value= 0.817
beta-value= 1.882

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	1087	4.98624
4.5	407	1.86697
5.0	146	0.66972
5.5	54	0.24771
6.0	27	0.12385
6.5	11	0.05046
7.0	6	0.02752
7.5	1	0.00459