Appendix F Geotechnical Engineering/Geologic Hazards Investigation Report

Appendix

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GEOTECHNICAL ENGINEERING/GEOLOGIC HAZARDS INVESTIGATION
PROPOSED HOPE ELEMENTARY SCHOOL NEW MULTI-USE GYMNASIUM BUILDING
613 W. TEAPOT DOME AVENUE PORTERVILLE, TULARE COUNTY, CALIFORNIA

PROJECT NO. 012-23205
NOVEMBER 16, 2023

Prepared for:

MS. MELANIE MATTA
HOPE ELEMENTARY SCHOOL DISTRICT
613 W. TEAPOT DOME AVENUE
PORTERVILLE, CALIFORNIA 93257

Prepared by:

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November 16, 2023 KA Project No. 012-23205

Ms. Melanie Matta
Hope Elementary School District
613 W. Teapot Dome Avenue
Porterville, California 93257

RE: Geotechnical Engineering/Geologic Hazards Investigation
Proposed Hope Elementary School
New Multi-Use Gymnasium Building
613 W. Teapot Dome Avenue
Porterville, Tulare County, California

Dear Ms. Matta:

In accordance with your request, we have completed a Geotechnical Engineering/Geologic Hazards Investigation for the above-referenced site. The results of our investigation are presented in the attached report.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (559) 348-2200.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

REGISTERED PROFESSIONAL ENGINEER
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NEW MULTI-USE GYMNASIUM BUILDING
613 W. TEAPOT DOME AVENUE
PORTERVILLE, TULARE COUNTY, CALIFORNIA

INTRODUCTION

This report presents the results of our Geotechnical Engineering/Geologic Hazards Investigation for the proposed Hope Elementary School new multi-use gymnasium building located at 613 W. Teapot Dome Avenue in Porterville, Tulare County, California. Discussions regarding site conditions are presented herein, together with conclusions and recommendations pertaining to site preparation, Engineered Fill, utility trench backfill, drainage and landscaping, foundations, concrete floor slabs and exterior flatwork, retaining walls and soil-cement reactivity.

A site plan showing the approximate boring locations is presented following the text of this report. A description of the field investigation, boring logs, and the boring log legend are presented in Appendix A. Appendix A contains a description of the laboratory testing phase of this study, along with the laboratory test results. Appendices B and C contain guides to earthwork and pavement specifications. When conflicts in the text of the report occur with the general specifications in the appendices, the recommendations in the text of the report have precedence.

PURPOSE AND SCOPE

This investigation was conducted to evaluate the soil and groundwater conditions at the site, to make geotechnical engineering recommendations for use in design of specific construction elements, and to provide criteria for site preparation and Engineered Fill construction.

Our scope of services was outlined in our proposal dated September 20, 2023 and included the following:

- A site reconnaissance by a member of our engineering staff to evaluate the surface conditions at the project site.
- A review of available data for evaluation of subsurface conditions at the project site. This included review of a Soils Investigation prepared by Consolidated Testing Laboratories, Inc dated July 28, 2020 (Project No. E2774-20).
- Aerial photograph interpretation.

- A search of geologic and seismologic literature pertaining to the area of the site.
- Evaluation of potential geologic hazards.
- A field investigation consisting of drilling 3 borings to depths ranging from approximately 10 to 50 feet for evaluation of the subsurface conditions at the project site.
- Performing laboratory tests on representative soil samples obtained from the borings to evaluate the physical and index properties of the subsurface soils.
- Evaluation of the data obtained from the investigation and an engineering analysis to provide recommendations for use in the project design and preparation of construction specifications.
- Preparation of this report summarizing the results, conclusions, recommendations, and findings of our investigation.

PROPOSED CONSTRUCTION

We understand that design of the proposed development is currently underway. Some of the final details pertaining to the structures are unavailable. The proposed project will include a new multi-use gymnasium building. It is understood the new multi-use gymnasium building at Hope Elementary School is in the design stages. It is anticipated the gymnasium building will be a single- or two-story structure utilizing conventional shallow foundations. Foundation loads are anticipated to be moderate. On-site landscaping and gravel parking areas are also planned to be associated with the project.

In the event these structural or grading details are inconsistent with the final design criteria, the Soils Engineer should be notified so that we may update this writing as applicable.

SITE LOCATION, SITE HISTORY AND SITE DESCRIPTION

The proposed Hope Elementary School new multi-use gymnasium building and gravel parking area is located approximately ¼ mile west of Road 238 on the south side of W. Teapot Dome Avenue just east of the existing school site. The site address is 613 W. Teapot Dome Avenue in Porterville, Tulare County, California (see Vicinity Map, Figure 1). The school site encompasses approximately 5 acres and is comprised of four permanent classroom buildings, six portable class room buildings, a shop building, a portion of a citrus orchard, water tank and well, lawn and asphaltic play areas, solar arrays, and both asphaltic concrete and decomposed granite parking areas. The proposed project area is bound to the north by W. Teapot Dome Avenue, over-head electric lines, citrus orchards, and a rural residence; to the west by a over-head electric line, chain linked fence, school and shop buildings, water tank and well, and asphaltic concrete and lawn play areas; and to the south and east by a citrus orchard. The central portion of the existing school site has a longitude 119.031613° West and latitude 36.021748° North. The USGS "Porterville" topographic quadrangle map, dated 1993 indicates that surface elevations in the vicinity of the site are on the order of 475 feet above mean sea level. A major water course identified as the Tule River is located approximately 2.4 miles north of the subject site. Other

water courses in the area are the Poplar Ditch, located approximately 1.5 miles to the north; Deer Creek, located approximately 2.1 miles south of the site; and the Kern-Friant Canal, located approximately 3.7 miles west of the site.

Site history was obtained by reviewing historical aerial photographs taken in 1934, 1937, 1952, 1969, 1977, 1984, 1969, 1977, 1984, 1994, 2006, 2009, 2012, 2016, and 2020. Review of the 1934 aerial photograph indicates that the project site was a vacant field. W. Teapot Dome Avenue and an over-head electric line was located to the north of the site. The surrounding land was utilized as grazing land or dry farming.

Review of the 1937 aerial photograph indicates that the project site conditions appeared to be relatively similar to that noted in the 1934 aerial photograph.

Review of the 1952 aerial photograph indicates that a school yard with approximately four to six structures appeared on the eastern portion of the school property. Approximately 20 to 30 trees were located along the perimeter of the site. A rural residence appeared to the west of the site and a wheat crop appeared in the project area east of the school.

Review of the 1969 aerial photograph indicates that the previous school structures were removed and four larger school structures appeared mainly on the east ½ of the site. An orchard or vineyard appeared in the site vicinity east of the school and an additional play field appeared south of the original play field. An asphaltic concrete play surface was located in the central portion of the site. Another rural residence appeared west of the site.

Review of the 1977 aerial photograph indicates that the project site conditions appeared to be relatively similar to that noted in the 1969 aerial photograph with a rural residence appearing to the north of the site.

Review of the 1984 aerial photograph indicates that the project site conditions appeared to be relatively similar to that noted in the 1977 aerial photograph.

Review of the 1994 aerial photograph indicates that the site conditions appeared to be relatively similar to that noted in the 1984 aerial photograph with a citrus crop replacing the prior orchard or vineyard.

Review of the 2006 aerial photograph indicates that a classroom building appeared in the north/central area and a concrete parking lot appeared on the northern portion of the site. An enlarged asphaltic concrete play area was also located in the central portion of the school campus.

Review of the 2009 aerial photograph indicates that the project site conditions appeared to be relatively similar to that noted in the 2006 aerial photograph.

Review of the 2012 aerial photograph indicates that the classroom building in the north/central area of the school was expanded to the west and three portable classroom buildings appeared on the west side of the campus. In the project vicinity on the east side of the school, five rows of citrus trees were removed and a parking area appeared.

Review of the 2016 aerial photograph indicates that the site conditions appeared to be relatively similar to that noted in the 2012 aerial photograph with three more portable classrooms appearing on the west side. A water tank also appeared on the east side of the campus.

Review of the 2020 aerial photograph indicates that the site conditions appeared to be relatively similar to that noted in the 2016 aerial photograph with solar arrays appearing on the south side of the play field.

Presently, the site consists of a decomposed granite parking area and a citrus orchard. A new kindergarten building was built to the northwest of the project area since the 2020 aerial photograph was taken. The existing Hope Elementary School site is located just to the west of the project area and is comprised of eleven permanent or temporary structures; lawn and asphaltic play areas; a water well and tank; and asphaltic concrete and decomposed granite parking lots. The multi-use gymnasium building is planned to be located approximately 100 feet southeast of the existing kindergarten building. The proposed gravel parking area is planned to be located on the north side of the multi-use gymnasium building. Buried utility lines are located along the edges of the site and may extend into the project site.

The proposed eastern and southern portions of the project areas are covered by a citrus orchard. A decomposed granite parking area covers the northwestern portion of the project area. A small concrete debris pile and an end dump pile is located in the southeast area of the decomposed granite parking lot. Repeated disking activities had been performed within the existing and prior citrus orchard and the surface soils have a loose consistency. The site is relatively level with no major changes in grade. Approximately two to three feet of relief exist across the site.

No evidence of surface faulting was observed on the property during our reconnaissance. No evidence of slope failures or instabilities were observed on the subject property or adjoining properties.

GEOLOGIC SETTING

General

The subject property is located within the San Joaquin Valley portion of the Great Valley Geomorphic Province of California. The Great Valley is bordered to the north by the Cascade and Klamath Ranges, to the west by the Coast Ranges, to the east by the Sierra Nevada, and the south by the Transverse Ranges. The valley formed by tilting of the Sierran Block with the western side dropping to form the valley and eastern side being uplifted to form the Sierra Nevada. The valley is characterized by a thick sequence of sediments derived from erosion of the adjacent Sierra Nevada to the east and the Coast Ranges to the west. These sedimentary rocks are mainly Cretaceous in age. The depth of the sediments varies from a thin veneer at the edges of the valley to depths in excess of 30,000 feet in the south and 50,000 feet in the north along the western edge of the valley. The subject site is approximately 2.4 miles south of the Tule River.

A Regional Geologic Map and Local Geologic Map are presented on Figures 4 and 5, respectively.

Lithology

According to the Geologic Map of California, Fresno Sheet, (Olaf P. Jenkins Edition, Compilation by Matthews and Burnett, 1965) the surface deposits in the vicinity of the subject site are recognized as Pleistocene nonmarine deposits derived from the western slopes of the Sierra Nevada and deposited mainly by Deer Creek and the Tule River. Geologic materials in the vicinity of the site include Quaternary deposits consisting of unweathered gravels, sands, silts, and clays deposited by the present-day stream, creek, and river systems along with Quaternary fan deposits.

The subsurface information obtained in conjunction with the soil borings performed during previous Geotechnical Engineering Investigations indicate that the surface and near-surface deposits at the subject site consist predominately of silty sands, sandy clays, and clayey sands. These observed deposits are consistent with those mapped in the area, and are further described in soil profile section within this report.

Structure and Faults

The general area of the subject site is underlain by a momoclinal series of Cenozoic deposits dipping gently to the southwest towards the center of the San Joaquin Valley. The contact between the Cenozoic and basement rocks dips nearly 8 degrees southwest, or at a slightly greater inclination than does the on-lapping homoclinal Cenozoic sequence. No active faults are mapped within the Porterville area, and based on mapping and historical seismicity, the seismicity of the Porterville area is considered low by the scientific community.

Adjacent to the San Joaquin Valley, the Sierra Nevada and Coast Ranges are geologically young mountain ranges that possess active and potentially active fault zones. Major active faults and fault zones occur at some distance to the east and west of the project site (see the Fault Map, Figure 6). Table I is a listing of significant active faults within 100 miles of the site.

Numerous active faults are present within the central Coast Ranges west of the site including the San Andreas Fault located approximately 67 miles west of the subject site.

The San Andreas Fault is considered active and is of primary concern in evaluating seismic hazards throughout California. The 684-mile-long San Andreas Fault zone is the principal element of the San Andreas Fault system, a network of faults with predominately dextral strike-slip displacement that collectively accommodates the majority of relative north-south motion between North American and Pacific plates. The San Andreas Fault zone is considered to be the Holocene and historically active dextral strike-slip fault that extends along most of coastal California from its complex junction with the Mendocino fault zone on the north, southeast to the northern Transverse Range and inland to the Salton Sea, where a well-defined zone of seismicity transfers the slip to the Imperial fault along a right-releasing step (USGS 2006).

Two major surface rupturing earthquakes have occurred on the San Andreas Fault in historic time: the 1857 Fort Tejon and 1906 San Francisco earthquakes. Additional historic surface rupturing earthquakes include the unnamed 1812 earthquake along the Mojave section and the northern part of the San

Bernardino Mountains section, and a large earthquake in the San Francisco Bay area that occurred in 1838 that was probably on the Peninsula section. Historic fault creep rates are as high as 32 millimeters per year for the 82-mile-long creeping section in central California with creep rates gradually tapering to zero at the northwestern and southeastern edge of the section.

One of the nearest seismotectonic sources is the Great Valley Fault Zone (Coast Ranges-Central Valley boundary zone), located approximately 50 miles west of the site. The Great Valley Fault zone is the geomorphic boundary of the Coast Ranges and the Central Valley and is underlain by a 300-mile long seismically active fold and thrust belt that has been the source of recent earthquakes, such as the 1983 magnitude 6.5 Coalinga and the 1985 magnitude 6.1 Kettleman Hills earthquakes. Nearly the entire thrust system is concealed or "blind". The basal detachment of this thrust system dips at a shallow angle to the west. East-directed thrusting over ramps in the detachment and west-directed thrusting on backthrusts are responsible for the uplift along the eastern range front of the Coast Ranges. Based on earthquake focal mechanisms, movement on the thrust zone is generally perpendicular to the strike of the geomorphic boundary and trend of the San Andreas Fault system. Shortening along the geomorphic boundary is driven by a component of the Pacific-North American Plate motion that is normal to the plate boundary. The Great Valley Fault zone is considered the dominant seismic feature with potential for affecting the subject site.

The White Wolf Fault is located approximately 54 miles south of the subject site. The White Wolf Fault is traceable in the southern San Joaquin Valley from Tehachapi Canyon southwestward along the base of the northwest face of Bear Mountain to a point where it is lost beneath the alluvium near Wheeler Ridge. A magnitude 7.7 earthquake occurred on this fault near Wheeler Ridge that affected Kern County and surrounding areas. The ground ruptured in a generally discontinuous trend along most of the length of the fault from Wheeler Ridge to Caliente. The maximum vertical displacement along the rupture measured at roughly three feet. Surface cracks and evidence of lurching were observed for several miles on each side of the fault as a result of this movement and numerous subsequent aftershocks.

Active and potentially active faults on the east side of the Sierra Nevada include the Sierra Nevada Fault (located 57.6 miles east), the Independence Fault (located 60.7 miles east), and the Owens Valley Fault (located 65.5 miles east). A number of other faults with related activity, including the Little Lake, Pleito, Birch Creek, Hunter Mountain, Fish Slough, Deep Springs, and Hilton Creek faults, are associated with potential volcanism in the Long Valley Caldera, the Mono Craters Caldera, and Inyo Craters. The Owens Valley Fault was responsible for generating the 8+ magnitude earthquake occurring in 1872.

The Pond-Posa Creek Fault is located approximately 28 miles southwest of the subject site. The Pond-Poso Creek Faults trends northwesterly for 35± miles from the eastern margin of the valley to near the center of the valley just southwest of Delano. Modern aseismic activity occurs on this fault along a 2.1-mile-long surface scarp a few miles southwest of Delano. The activity is restricted to an area of land subsidence caused by declines in groundwater levels. Although modern movement has been attributed by some geologist to local tectonics, measurements of fault movement and corresponding groundwater

level support a relation between modern faulting and groundwater withdrawal. From February 1977 to March 1979, the fault moved at monitored locations only during periods when the water table declined. During periods of water table recovery, fault movement ceased.

The eastern border of the southern San Joaquin Valley is cut by a series of en-eschelon range front faults. These faults are mainly northwest trending normal faults, down dropped to the west and with a near vertical dip. Three unnamed, northwest trending inferred faults are mapped approximately 1,500 feet east of the subject site, extending along the edge of the Foothills, from an area approximately 4 miles south of State Highway 190 to State Highway 201 near Dinuba. These faults are considered to be pre-Quaternary faults or faults without recognized Quaternary displacement. These faults are not necessarily inactive.

Further discussion relating to active faults in the region is presented in the Probabilistic Seismic Hazards Analysis section of this report.

GEOLOGIC HAZARDS

Fault Rupture Hazard Zones in California

The Alquist-Priolo Geologic Hazards Zones Act went into effect in March, 1973. Since that time, the act has been amended 10 times (Hart, 1994). The purpose of the Act, as provided in DMG Special Publication 42 (SP 42), is to prohibit the location of most structures for human occupancy across the traces of active faults and to mitigate thereby the hazard of fault-rupture." The act was renamed the Alquist-Priolo Earthquake Fault Zoning Act in 1994, and at that time, the originally designated "Special Studies Zones" was renamed the "Earthquake Fault Zones."

The subject site does not lie on a Fault Rupture Hazard Zones Map, and accordingly, the site is not within a Fault-Rupture Hazard Zone. The nearest zoned fault is a portion of the Great Valley Fault system located more than 49 miles west of the subject site.

Seismic Hazard Zones in California

In 1990, the California State Legislature passed the Seismic Hazard Mapping Act to protect public safety from the effects of strong shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes. The Act requires that the State Geologist delineate various seismic hazards zones on Seismic Hazards Zones Maps. Specifically, the maps identify areas where soil liquefaction and earthquake-induced landslides are most likely to occur. A site-specific geotechnical evaluation is required prior to permitting most urban developments within the mapped zones. The Act also requires sellers of real property within the zones to disclose this fact to potential buyers. The area of the subject site is not included on any of the maps released to date. It is not known whether the subject site will be within a seismic hazard zone on a future map.

Historic Seismicity/Earthquake Epicenter Distribution

The Porterville area has historically experienced a low to moderate degree of seismicity. A listing of historic earthquakes with magnitudes greater than 4.0 within approximately 50 miles (80 kilometers) of the subject site was obtained from the comprehensive California Geological Survey computerized earthquake catalog for the State of California, the Townley and Allen (1939) catalog and the U.S. Geological Survey Earthquake Data Base System. In addition, a listing was obtained for all historic earthquakes with magnitudes greater than 5.0 within approximately 100 miles of the site. The listings include the date, time, location, depth, magnitude, and intensity all recorded events within the search radius between 1800 and 2021. A review of the literature for pre-1900 earthquakes (Toppozada, 1991) does not reveal any significant recorded seismic events in the vicinity of the subject site prior to the period covered by the above listing.

The historic earthquake listings are included in Appendix D. A plot of epicenters associated with historic earthquakes in the region of the site with magnitudes greater than 5 is shown on Figure 8, Epicenter Map. The earthquake data indicates that 62 events with magnitudes greater than 4.0 occurred within 50 miles of the subject site between 1800 and 2021. The data indicates that 117 events exceeded magnitudes 5.0 within 100 miles of the subject site. The nearest listed magnitude 5.0 event occurred approximately 12.5 miles from the site in 1915 with a magnitude of 5.0. Four of the listed earthquakes with magnitudes greater than 4.0 occurred within 25 miles of the site. Numerous earthquakes are listed with magnitudes between 5.0 and 6.0 beyond about 50 miles of the site. Eighteen events were recorded with magnitudes greater than 6.0 within 100 miles of the site.

The geologic literature indicates that groundshaking of VII intensity (Modified Mercalli Scale) was felt in Porterville from the 1872 Owens Valley Earthquake. This is the largest known earthquake event to have affected the Porterville area. The most recent earthquake significant to the Porterville area, was the Coalinga seismic event which occurred on May 2, 1983 within the Coast Ranges-Sierran Block Boundary Seismotectonic structure. The Coalinga seismic event had a magnitude of Mw 6.5. The initial shock had a Modified Mercalli Intensity of V in the Porterville area. This earthquake and aftershocks had a substantial affect on the Porterville area but no damage, either architectural or structural, was reported in the area of the subject site.

Geologic Subgrade

Information obtained from the geologic literature, as well as data from the above-described site exploration, indicate the general soil profile at the site consists predominately of loose to very dense silty sands, clayey sands, sandy clays, sandy silts and sands. Some of these soils contained varying amounts of gravel. Some of these soils were weakly cemented. These younger soils are underlain at depth by very dense decomposed granite and granitic rock. Assuming that any loose surface soil and fill materials on the site are removed and recompacted as recommended in our Geotechnical Engineering Investigation, the geologic subgrade of the site can be conservatively approximated as "stiff soil". A Joyner-Boore Class C subgrade classification is considered appropriate for the soil profile and

corresponds with a National Earthquake Hazard Reduction Program (NEHRP) (BSSC, 1994) Site Class D. The site class definition from the 2022 California Building Code that is most consistent with the site conditions is Site Class D.

Soil Liquefaction

Soil liquefaction is a state of soil particles suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs in soils such as sand in which the strength is purely friction. However, liquefaction has occurred in soils other than clean sand. Liquefaction usually occurs under vibratory conditions such as those induced by seismic event.

To evaluate the liquefaction potential of the site, the following items were evaluated:

1) Groundwater depth;

2) Soil type;

3) Relative density;

4) Initial confining pressure;

5) Intensity and duration of groundshaking.

The soils encountered within a depth of 50 feet on the project site predominately consisted medium dense to very dense silty sand, clayey sand, sandy silt, silty sand/sandy silt, clayey sand/sandy clay, and silty sand/sand or very stiff to hard sandy clay were encountered. Some of the soils contained varying amounts of gravels between 37 and 40 feet. Groundwater was not encountered within a depth of 50 feet during our subsurface exploration. Available groundwater data was gathered from the California Department of Water Recourses and indicates that groundwater depth has been as shallow as 59.4 feet within approximately 1 mile of the project site vicinity. Well site code No. 360228N1190356W001 is located approximately ¼ miles to the northwest of the site and a reading on September 11, 1924 showed that ground surface elevation to water surface elevation was measured at 59.4 feet.

The potential for soil liquefaction during a seismic event was evaluated using the LIQUEFYPRO computer program (version 5.8h) developed by CivilTech Software. For the analysis, a maximum earthquake magnitude of 6.22 was used. A peak horizontal ground surface acceleration of 0.345g was considered conservative and appropriate for the liquefaction analysis. A groundwater depth of 50 feet was used for the analysis. The analysis indicates that the on-site soils are considered to be slightly liquefiable with the total and differential seismic induced settlement not anticipated to exceed a ⅓ inch and a ¼ inch, respectively. The differential settlement is estimated over a horizontal distance of 100 feet. Therefore, it is not anticipated that liquefaction will have a significant effect on the proposed development. Accordingly, the liquefaction potential at the site is considered low and measures to mitigate liquefaction potential are not recommended.

Seismic Settlement

One of the most common phenomena during seismic shaking accompanying any earthquake is the induced settlement of loose unconsolidated soils. Based on the nature of the subsurface materials, the plan to excavate and recompact the upper soils and any loose fill soils within the proposed building areas and the relatively low to moderate seismicity of the region, we would not expect seismic settlement or lateral spread to represent a significant geologic hazard to the site provided that the recommendations of our referenced Geotechnical Engineering Investigation are followed.

The estimated seismic settlement was determined at the site using the settlement analysis method by Tokimatsu/Seed and Modify Stark/Olsen (1987). The results of the settlement analysis are included as follows:

	Seismic Settlement (inches)				
Location	**Saturated Settlement**	**Unsaturated Settlement**	**Total Settlement**	**Range of Differential Settlement**	**Design for Differential Settlement**
B2	0.00	0.33	0.33	0.164 to 0.217	¼ Inch in 100 Feet

The above settlement values were determined at a specific boring location. The consolidated settlement (under static load of specific structures) and differential settlement (per specified length in building area) are indicated in the Foundations section of this report. However, the project's Structural Engineer should consider the estimated settlements when designing the foundations for the proposed structures.

The native soils within the project site are not conducive to hydrocollapse due to the relatively medium dense soil conditions, low void-ratio, and moderate to high penetration resistance measured. Any loose fill material at the site could be vulnerable to hydrocollapse. However, it is recommended the loose soils and fill material be moisture-conditioned and recompacted. Therefore, the structure will not be vulnerable to hydrocollapse. In addition, this hazard can be mitigated by following the design and construction recommendations of current and future Geotechnical Engineering Investigations (over-excavation and rework of any loose soils and/or uncertified fill materials).

The potential for lateral spreading was evaluated using the "Revised Multilinear Regression Equations for Predication of Lateral Spread Displacement" by Youd, Hansen, Corbett and Bartlett (2002). Based on a lack of shallow liquefiable soils within the subject site, distance of proposed structures from the Poplar Ditch, and a lack of saturated cohesionless sediments with $(N1)_{60}$ less than 15, the site is not likely subject to lateral spreading hazards.

Subsidence Due to Fluid Withdrawal

Portions of California, such as the San Joaquin Valley have been subject to land subsidence due to fluid withdrawal (groundwater and petroleum). However, the area of the subject site is not known to be subject to such subsidence hazards.

Expansive Soils

The surface and near-surface soils observed on the site surface consist of silty sands, clayey sands, sandy clays, and sandy silts. These materials are considered to have a low expansion potential. Recommendations are provided in the Site Preparation section of this report to mitigate expansive soils.

Inundation Hazards

A review of Federal Emergency Management Agency (FEMA) Flood Insurance Mapping for the area of the subject site (Community Panel Numbers 06107C1645E) indicates that the subject site is not located within a Special Flood Hazard Area Inundated by 100-year flood. In addition, current mapping for the area of the subject site indicates that the subject site is located within Zone X, areas determined to be outside the 0.2% annual chance flood plain (refer to Flood Map, Figure 11).

An inundation hazard of the site would be unlikely due to the fact that Schafer Dam (Lake Success) is located 6.7 miles northeast of the site on the Tule River. The elevation difference of the Tule River bottom near the site is approximately 24 feet below the site elevation. The site is located 2.4 miles south of the Tule River and approximately 0.4 miles outside of the inundation boundary (refer to Inundation Map, Figure 12).

Tsunamis and Seiches

A tsunami is a series of ocean waves generated in the ocean by an impulsive disturbance. Due to the inland location of the subject site, tsunamis are not considered a threat to the site. Seiches are standing waves in a body of water such as a lake or reservoir. Because such a body of water is not located near the site, seiches are not anticipated to affect the subject site.

Slope Stability and Potential for Slope Failure

Due to the generally flat-lying nature of the site and surrounding areas, problems from landslides are not anticipates to affect this site.

Volcanic Hazards

The subject site is not within an area known to be affected by volcanic hazards (Miller, 1989, USGS Bulletin, 1847).

County Seismic Safety Element

Documentation and mapping included in the Health and Safety Element of the City of Porterville County General Plan, dated 2021, were reviewed. The seismic information contained within the Safety Elements is somewhat dated and or generalized and is superseded by more recent information and analyses described herein. The referenced documents generally indicate that the site area is subject to relatively low to moderate seismicity and related hazards.

FIELD AND LABORATORY INVESTIGATIONS

Subsurface soil conditions were explored by drilling 3 borings to depths ranging from approximately 10 to 50 feet below existing site grade, using a truck-mounted drill rig. The approximate boring locations are shown on the Site Geologic Map, Figure No. 2. During drilling operations, penetration tests were performed at regular intervals to evaluate the soil consistency and to obtain information regarding the engineering properties of the subsoils. Soil samples were retained for laboratory testing. The soils encountered were continuously examined and visually classified in accordance with the Unified Soil Classification System.

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory testing program was formulated with emphasis on the evaluation of natural moisture, density, gradation, shear strength, consolidation potential, expansion potential, plasticity and moisture-density relationships of the materials encountered. Details of the laboratory test program and results of the laboratory tests are summarized in Appendix A. This information, along with the field observations, was used to prepare the final boring logs in Appendix A.

SOIL PROFILE AND SUBSURFACE CONDITIONS

Based on our findings, the subsurface conditions encountered appear typical of those found in the geologic region of the site. Approximately 1 foot of fill material was encountered within Boring No. B-3 located in the southeastern area of the proposed multi-use gymnasium building. The fill material consisted of a silty sand. The upper soils within the other two borings and beneath the silty sand fill within Boring No. B-3, consisted predominantly of approximately 12 inches of very loose silty sand with clay or clayey sand/sandy clay. The thickness and extent of fill material was determined based on limited test borings and visual observation. Thicker fill may be present at the site. Limited testing was performed on the fill soils during the time of our field and laboratory investigations. The limited testing indicates that the fill material had varying strength characteristics ranging from loosely placed to compacted.

Below the fill and loose surface soils, approximately 3 to 3½ feet of loose to very dense silty sand with clay, silty sand/sandy silt, and clayey sand/sandy clay were encountered. Field and laboratory tests suggest that these soils are moderately strong, slightly compressible, and have a very low to low expansion potential. Penetration resistance ranged from 9 to 68 blows per foot. Dry densities ranged from 105 to 113 pcf. A representative soil sample consolidated approximately 1 percent under a 2 ksf load when saturated. A representative soil sample had an angle of internal friction of 28 degrees. Representative samples of the clayey soils had expansion indices of 15 to 24.

Below 4 to 4½ feet, layers of predominately medium dense to very dense silty sand, clayey sand, sandy silt, silty sand/sandy silt, clayey silt, and silty sand/sand or very stiff to hard sandy clay were encountered. Some of these soils contained varying amounts of gravel. Some of these soils were weakly cemented. Field and laboratory tests suggest that these soils are moderately strong and slightly compressible. Penetration resistance ranged from 19 blows per foot to greater than 50 blows per six inches. Dry densities ranged from 102 to 124 pcf. A representative soil sample consolidated

approximately 3 percent under a 2 ksf load when saturated. A representative soil sample had an angle of internal friction of 41 degrees. These soils had similar strength characteristics as the upper soils and extended to the termination depth of our borings.

For additional information about the soils encountered, please refer to the logs of borings in Appendix A.

GROUNDWATER

Test boring locations were checked for the presence of groundwater during and immediately following the drilling operations. Free groundwater was not encountered within a depth of 50 feet below site grade. Review of the Department of Water Resources groundwater level readings from September 11, 1924 indicate that the historic high groundwater within the project site and vicinity was as shallow as 59.4 feet below site grade. Groundwater information was obtained from multiple groundwater wells located within approximately 1 mile of the subject site. Well Site Code: 360228N1190356W001 is located approximately ¼ of a mile to the northwest of the site and had the shallowest ground surface elevation to groundwater surface elevation of 59.4 feet.

Lenses of very dense, weakly cemented sandy silt and clayey silt, locally referred to as "hardpan", were encountered between 4 to 6 feet in some of the borings. This cementation retards the free percolation of the surface water into the soil stratum below the hardpan frequently resulting in a temporary perched water table condition at or near the ground surface.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use and climatic conditions, as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of our field and laboratory investigations, along with previous geotechnical experience in the project area, the following is a summary of our evaluations, conclusions, and recommendations.

Administrative Summary

In brief, the subject site and soil conditions with the exception of the loose surface soils, fill material, expansive potential of the clayey surface soils, and existing development, appear to be conducive to the development of the project. The surface soils are disturbed, have low strength characteristics, and are highly compressible when saturated. Accordingly, it is recommended that the surface soils be recompacted. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation.

Approximately 1 foot of fill material was encountered within portions of the site. The fill material predominately consisted of silty sand. The thickness and extent of fill material was determined based on limited test borings and visual observation. Thicker fill may be present at the site. Limited testing was performed on the fill soils during the time of our field and laboratory investigations. The limited testing indicates that the fill soils ranged from loosely placed to compacted. Fill soils that have not been properly compacted and certified should be excavated and stockpiled so that the native soils can be prepared properly. Prior to fill placement, Krazan & Associates, Inc. should inspect the bottom of the excavation to verify no additional removal will be required.

The site is located just east of an elementary school campus. The proposed project area presently consists of a decomposed granite parking lot and a citrus orchard. Associated with these developments may be buried structures, such as utility lines and irrigation lines that may extend into the project site. Any surface or buried structures, including irrigation lines, utilities or loosely backfilled excavations, encountered during construction should be properly removed and/or relocated. It is suspected demolition of the existing structures will disturb the upper soils. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill. Disturbed areas caused by demolition activities should be removed and/or recompacted.

Clayey soils were encountered within the site. These clayey soils appear to have a moderate shrink/swell potential. The estimated swell pressure of the clayey material may cause movement affecting slabs and brittle exterior finishes. To reduce the potential soil movement, it is recommended that the upper 12 inches of soil within slab-on-grade and exterior flatwork areas consist of non-expansive fill. The fill material should be a well-graded silty sand or sandy silt soil. A clean sand or very sandy soil is not acceptable for this purpose. A sandy soil will allow the surface water to drain into the expansive clayey soils below, which may result in swelling. The replacement soil and/or the upper 12 inches of Imported Fill soils should meet the specifications as described under the subheading Engineered Fill. The replacement soils should extend 5 feet beyond the perimeter of the building. The non-expansive replacement soil should be compacted to at least 90 percent relative compaction based on ASTM Test Method D1557. The exposed native soils in the excavation should not be allowed to dry out and should be kept continuously moist prior to backfilling. In addition, it is recommended that slabs-on-grade continuous footings and slabs be nominally reinforced to reduce cracking and vertical off-set.

As an alternative to the use of non-expansive soils, the upper 12 inches of soil supporting the slab areas can consist of lime-treated clayey soils. The lime-treated soils should be recompacted to a minimum of 90 percent of maximum density. Preliminary application rate of lime should be 5 percent by dry weight. The lime material should be calcium oxide, commonly known as quick-lime. The clayey soils should be above optimum moisture during the mixing operations.

Several trees are located mainly on the eastern and southern areas of the site associated with a citrus orchard. If not utilized for the proposed development, tree removal operations should include roots greater than 1 inch in diameter. The resulting excavations should be backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Sandy soil conditions were encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these sandy soils.

After completion of the recommended site preparation, the site should be suitable for shallow footing support. The proposed structure footings may be designed as conventional spread or continuous footings with an allowable bearing pressure of 3,000 psf for dead-plus-live loads. Conventional footings should have a minimum embedment of 18 inches.

Groundwater Influence on Structures/Construction

Groundwater was not encountered within 50 feet below the site surface. Based on our findings and historical records, it is not anticipated that groundwater will not rise within the zone of structural influence or affect the construction of foundations for the project. However, if earthwork is performed during or soon after periods of precipitation, the subgrade soils may become saturated, "pump," or not respond to densification techniques. Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material; or mixing the soil with an approved lime or cement product. Our firm should be consulted prior to implementing remedial measures to observe the unstable subgrade conditions and provide appropriate recommendations.

Some structures in the Porterville area that are founded on hardpan have experienced standing water for extended periods of time in crawl spaces below wooden floors or within sunken floor slab areas. The sources of the water were natural precipitation and landscape irrigation, and consequently, wood floor and sunken floor slab construction in hardpan soils are discouraged.

Site Preparation

General site clearing should include removal of vegetation; existing utilities; structures including foundations; basement walls and floors; existing stockpiled soil; trees and associated root systems; rubble; rubbish; and any loose and/or saturated materials. Site stripping should extend to a minimum depth of 2 to 4 inches or until all organics in excess of 3 percent by volume are removed. Deeper stripping may be required in localized areas. These materials will not be suitable for use as Engineered Fill. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas.

Approximately 1 foot of fill material was encountered within portions of the site. The fill material predominately consisted of silty sand. The thickness and extent of fill material was determined based on limited test borings and visual observation. Thicker fill may be present at the site. Limited testing was performed on the fill soils during the time of our field and laboratory investigations. The limited testing indicates that the fill soils ranged from loosely placed to compacted. Fill soils that have not been properly compacted and certified should be excavated and stockpiled so that the native soils can be prepared properly. Prior to fill placement, Krazan & Associates, Inc. should inspect the bottom of the excavation to verify no additional removal will be required.

The site is located on the east side of an elementary school campus. The proposed project area presently consists of a decomposed granite parking lot and a citrus orchard. Associated with these developments may be buried structures, such as utility lines and irrigation lines that may extend into the project site. Any surface or buried structures, including utilities or loosely backfilled excavations, encountered during construction should be properly removed and/or relocated. The resulting excavations should be cleaned to firm native ground and backfilled with Engineered Fill, compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Excavations, depressions, or soft and pliant areas extending below planned finish subgrade level should be cleaned to firm undisturbed soil, and backfilled with Engineered Fill. In general, any septic tanks, debris pits, cesspools, or similar structures should be entirely removed. Concrete footings should be removed to an equivalent depth of at least 3 feet below proposed footing elevations or as recommended by the Soils Engineer. Water wells should be abandoned according to county standards. Any other buried structures should be removed in accordance with the recommendations of the Soils Engineer. The resulting excavations should be backfilled with Engineered Fill.

Several trees are located mainly on the eastern and southern areas of the site associated with a citrus orchard. If not utilized for the proposed development, tree removal operations should include roots greater than 1 inch in diameter. The resulting excavations should be backfilled with Engineered Fill compacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557.

Following stripping, demolition activities and fill removal, the exposed subgrade within the proposed building areas should be excavated to a depth of at least 24 inches below existing subgrade or 12 inches below the bottom of footings, whichever is deeper, worked until uniform and free from large clods, moisture-conditioned to a minimum of 2 percent above optimum moisture content, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend a minimum of 5 feet beyond structural elements. Prior to fill placement, the exposed subgrade soils should be proofrolled and observed by Krazan & Associates, Inc. to verify stability. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation. Soft or pliant areas should be excavated to firm native ground.

Following stripping, fill removal, and demolition activities, the exposed subgrade within the proposed exterior flatwork and pavement areas should be excavated to a depth of at least 12 inches, worked until uniform and free from large clods, moisture-conditioned to a minimum of 2 percent above optimum moisture content, and recompacted to a minimum of 90 percent of maximum density based on ASTM Test Method D1557. Limits of recompaction should extend a minimum of 2 feet beyond flatwork and pavements. Prior to fill placement, the exposed subgrade soils should be proofrolled and observed by Krazan & Associates, Inc. to verify stability. This compaction effort should stabilize the surface soils and locate any unsuitable or pliant areas not found during our field investigation. Soft or pliant areas encountered should be excavated to firm native ground.

It is recommended that the upper 12 inches of soil within proposed conventional slab-on-grade and exterior flatwork areas consist of non-expansive Engineered Fill or lime-treated Engineered Fill. The intent is to support the slab-on-grade areas with 12 inches of non-expansive or lime-treated fill. The fill

placement serves two functions: 1) it provides a uniform amount of soil which will more evenly distribute the soil pressures and 2) it reduces moisture content fluctuation in the clayey material beneath the building area. The non-expansive fill material should be a well-graded silty sand or sandy silt soil. A clean sand or very sandy soil is not acceptable for this purpose. A sandy soil will allow the surface water to drain into the expansive clayey soil below, which may result in soil swelling. Imported Fill should be approved by the Soils Engineer prior to placement. The fill should be placed as specified as Engineered Fill.

As an alternative to the use of non-expansive soils, the upper 12 inches of soil supporting the slab areas can consist of lime-treated clayey soils. The lime-treated soils should be recompacted to a minimum of 90 percent of maximum density. Preliminary application rate of lime should be 5 percent by dry weight. The lime material should be calcium oxide, commonly known as quick-lime. The clayey soils should be above optimum moisture during the mixing operations.

The upper soils, during wet winter months, become very moist due to the absorptive characteristics of the soil. Earthwork operations performed during winter months may encounter very moist unstable soils which may require removal to grade a stable building foundation. Project site winterization consisting of placement of aggregate base and protecting exposed soils during the construction phase should be performed.

A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Soils Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section and the Engineered Fill section.

Engineered Fill

The on-site, upper native soils and fill material are predominately clayey sand/sandy clay, silty sand/sandy silt and silty sand with clay. These soils will be suitable for reuse as Engineered Fill, provided they are cleansed of excessive organics, debris and fragments greater than 4 inches in maximum dimension. Soils with an expansion index greater than 15 should not be used in the upper 12 inches of soil supporting slabs-on-grade or exterior flatwork.

The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since he has complete control of the project site at that time.

Imported Fill should consist of a well-graded, slightly cohesive, fine silty sand or sandy silt, with relatively impervious characteristics when compacted. This material should be approved by the Soils Engineer prior to use and should typically possess the following characteristics:

Percent Passing No. 200 Sieve	20 to 50
Plasticity Index	10 maximum
UBC Standard 29-2 Expansion Index	15 maximum

Fill soils should be placed in lifts approximately 6 inches thick, moisture-conditioned to a minimum of 2 percent above optimum moisture content, and compacted to achieve at least 90 percent of maximum density based on ASTM Test Method D1557. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

Drainage and Landscaping

The ground surface should slope away from building pad and pavement areas toward appropriate drop inlets or other surface drainage devices. In accordance with Section 1804 of the 2022 California Building Code, it is recommended that the ground surface adjacent to foundations be sloped a minimum of 5 percent for a minimum distance of 10 feet away from structures, or to an approved alternative means of drainage conveyance. Swales used for conveyance of drainage and located within 10 feet of foundations should be sloped a minimum of 2 percent. Impervious surfaces, such as pavement and exterior concrete flatwork, within 10 feet of building foundations should be sloped a minimum of 1 percent away from the structure. Drainage gradients should be maintained to carry all surface water to collection facilities and off-site. These grades should be maintained for the life of the project.

Slots or weep holes should be placed in drop inlets or other surface drainage devices in pavement areas to allow free drainage of adjoining base course materials. Cutoff walls should be installed at pavement edges adjacent to vehicular traffic areas; these walls should extend to a minimum depth of 12 inches below pavement subgrades to limit the amount of seepage water that can infiltrate the pavements. Where cutoff walls are undesirable, subgrade drains can be constructed to transport excess water away from planters to drainage interceptors. If cutoff walls can be successfully used at the site, construction of subgrade drains is considered unnecessary.

Utility Trench Backfill

Utility trenches should be excavated according to accepted engineering practices following OSHA (Occupational Safety and Health Administration) standards by a Contractor experienced in such work. The responsibility for the safety of open trenches should be borne by the Contractor. Traffic and vibration adjacent to trench walls should be reduced; cyclic wetting and drying of excavation side slopes should be avoided. Depending upon the location and depth of some utility trenches, groundwater flow into open excavations could be experienced; especially during or following periods of precipitation.

Sandy soil conditions were encountered at the site. These cohesionless soils have a tendency to cave in trench wall excavations. Shoring or sloping back trench sidewalls may be required within these sandy soils.

Utility trench backfill placed in or adjacent to buildings and exterior slabs should be compacted to at least 90 percent of maximum density based on ASTM Test Method D1557. Utility trench backfill placed in pavement areas should be compacted to at least 90 percent of maximum density based on ASTM Test Method D1557. Pipe bedding should be in accordance with pipe manufacturer's recommendations.

The Contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The Contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

Foundations - Conventional

The proposed structures may be supported on a shallow foundation system bearing on a minimum of 12 inches of Engineered Fill. Spread and continuous footings supported on a minimum of 12 inches of Engineered Fill can be designed for the following maximum allowable soil bearing pressures:

Load	Allowable Loading
Dead Load Only	2,250 psf
Dead-Plus-Live Load	3,000 psf
Total Load, including wind or seismic loads	4,000 psf

The footings should have a minimum depth of 18 inches below pad subgrade (soil grade) or adjacent exterior grade, whichever is lower. Footings should have a minimum width of 12 inches, regardless of load. Ultimate design of foundations and reinforcement should be performed by the project Structural Engineer.

The footing excavations should not be allowed to dry out any time prior to pouring concrete. It is recommended that footings be reinforced by at least one No. 4 reinforcing bar in both top and bottom.

The total static movement is not expected to exceed 1 inch. Differential movement should be less than ½ inch. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction movement may occur if the foundation soils are flooded or saturated.

The total seismic-induced settlement is not expected to exceed a ⅓ inch. Differential settlement caused by a seismic event should be less than a ¼ inch. The anticipated differential settlement is estimated over a horizontal distance of 100 feet.

Resistance to lateral footing displacement can be computed using an allowable friction factor of 0.30 acting between the base of foundations and the supporting subgrade. Lateral resistance for footings can alternatively be developed using an equivalent fluid passive pressure of 250 pounds per cubic foot acting

against the appropriate vertical footing faces. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance. A ⅓ increase in the above value may be used for short duration, wind, or seismic loads.

Excavation Stability

Temporary excavations planned for the construction of the building and other associated structures may be excavated according to the accepted engineering practices following Occupational Safety and Health Administration (OSHA) standards by a Contractor experienced in such work. Open, unbraced excavations in undisturbed soils should be made according to the table below.

Recommended Excavation Slopes	
Depth of Excavation (ft)	**Slope (Horizontal:Vertical)**
	Temporary
0-6	1:1
6-12	1½:1
12-18	1¾:1
18+	2:1

If, due to space limitation, excavation near existing structures or roads is performed in a vertical position, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavation and installation. A specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction. The lateral pressures provided below may be used in the design of a braced-type shoring system.

Recommended Lateral Earth Pressure for Braced Shoring	
Depth of Excavation Below Ground Surface (feet)	**Lateral Soil Pressure (psf)**
0	0
0.25 H	45 H
H	45 H
Where H is the total depth of the excavation in feet.	

The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given above.

Since the Contractor has the ultimate responsibility for excavation stability, he may design a different shoring system for the excavation.

The excavation/shoring recommendations provided herein are based on soil characteristics derived from limited test borings within the site. Variations in soil conditions will likely be encountered during the excavations. Krazan & Associates, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation.

Floor Slabs and Exterior Flatwork

In areas that will utilize moisture-sensitive floor coverings, concrete slab-on-grade floors should be underlain by a water vapor retarder. The water vapor retarder should be installed in accordance with accepted engineering practice. The water vapor retarder should consist of a vapor retarder sheeting underlain by a minimum of 3 inches of compacted, clean, gravel of ¾-inch maximum size. To aide in concrete curing, an optional 2 to 4 inches of granular fill may be placed on top of the vapor retarder. The granular fill should consist of damp clean sand with at least 10 to 30 percent of the sand passing the 100 sieve. The sand should be free of clay, silt, or organic material. Rock dust which is manufactured sand from rock crushing operations is typically suitable for the granular fill. This granular fill material should be compacted.

The floor slab should be reinforced at a minimum with #3 reinforcement bars at 18 inches on-center each way within the floor slab's middle-third. Thicker floor slabs with increased concrete strength and reinforcement should be designed wherever heavy concentrated loads, heavy equipment, or machinery is anticipated.

The exterior floors should be poured separately in order to act independently of the walls and foundation system. All fills required to bring the building pads to grade should be Engineered Fills.

Moisture within the structure may be derived from water vapors which were transformed from the moisture within the soils. This moisture vapor can travel through the vapor membrane and penetrate the slab-on-grade. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To reduce moisture vapor intrusion, it is recommended that a vapor retarder be installed. It is recommended that the utility trenches within the structure be compacted, as specified in our report, to reduce the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the building is recommended. Positive drainage should be established away from the structure and should be maintained throughout the life of the structure. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed. In addition, ventilation of the structure (i.e. ventilation fans) is recommended to reduce the accumulation of interior moisture.

Lateral Earth Pressures and Retaining Walls

Walls retaining horizontal backfill and capable of deflecting a minimum of 0.1 percent of its height at the top may be designed using an equivalent fluid active pressure of 45 pounds per square foot per foot of depth. Walls that are incapable of this deflection or walls that are fully constrained against deflection may be designed for an equivalent fluid at-rest pressure of 65 pounds per square foot per foot per depth. Expansive soils should not be used for backfill against walls. The wedge of non-expansive backfill

material should extend from the bottom of each retaining wall outward and upward at a slope of 2:1 (horizontal to vertical) or flatter. The stated lateral earth pressures do not include the effects of hydrostatic water pressures generated by infiltrating surface water that may accumulate behind the retaining walls; or loads imposed by construction equipment, foundations, or roadways.

Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic concrete or other suitable backfill to reduce surface drainage into the wall drain system. The aggregate should conform to Class 2 permeable materials graded in accordance with the CalTrans Standard Specifications (2018). Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The pipes should be placed no higher than 6 inches above the heel of the wall in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Collector pipes may be either slotted or perforated. Slots should be no wider than ⅛ inch in diameter, while perforations should be no more than ¼ inch in diameter. If retaining walls are less than 6 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 4-inch diameter holes (concrete walls) or unmortared head joints (masonry walls) and not be higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

Seismic Parameters – 2022 California Building Code

The Site Class per Section 1613A of the 2022 California Building Code (2022 CBC) and ASCE 7-16, Chapter 20 is based upon the site soil conditions. It is our opinion that a Site Class D is most consistent with the subject site soil conditions. For seismic design of the structures based on the seismic provisions of the 2022 CBC, we recommend the following parameters:

Seismic Item	Value	CBC Reference
Site Class	D	Section 1613A.2.2
Site Coefficient F_a	1.325	Table 1613A.2.3 (1)
S_s	0.594	Section 1613A.2.1
S_{MS}	0.787	Section 1613A.2.3
S_{DS}	0.525	Section 1613A.2.4
Site Coefficient F_v	2.142	Table 1613A.2.3 (2)
S_1	0.229	Section 1613A.2.1
S_{M1}	0.491	Section 1613A.2.3
S_{D1}	0.327	Section 1613A.2.4
T_S	0.623	Section 1613A.2

* Based on Equivalent Lateral Force (ELF) Design Procedure being used.

Soil Cement Reactivity

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete (or stucco) and the soil. HUD/FHA and UBC have developed criteria for evaluation of sulfate levels and how they relate to cement reactivity with soil and/or water.

Soil samples were obtained from the site and tested in accordance with State of California Materials Manual Test Designation 417. The sulfate concentrations detected from these soil samples were less than 150 ppm and are below the maximum allowable values established by HUD/FHA and UBC. Therefore, no special design requirements are necessary to compensate for sulfate reactivity with the cement.

Compacted Material Acceptance

Compaction specifications are not the only criteria for acceptance of the site grading or other such activities. However, the compaction test is the most universally recognized test method for assessing the performance of the Grading Contractor. The numerical test results from the compaction test cannot be used to predict the engineering performance of the compacted material. Therefore, the acceptance of compacted materials will also be dependent on the stability of that material. The Soils Engineer has the option of rejecting any compacted material regardless of the degree of compaction if that material is considered to be unstable or if future instability is suspected. A specific example of rejection of fill material passing the required percent compaction is a fill which has been compacted with an in-situ moisture content significantly less than optimum moisture. This type of dry fill (brittle fill) is susceptible to future settlement if it becomes saturated or flooded.

Testing and Inspection

A representative of Krazan & Associates, Inc., should be present at the site during the earthwork activities to confirm that actual subsurface conditions are consistent with the exploratory fieldwork. This activity is an integral part of our service, as acceptance of earthwork construction is dependent upon compaction testing and stability of the material. This representative can also verify that the intent of these recommendations is incorporated into the project design and construction. Krazan & Associates, Inc., will not be responsible for grades or staking, since this is the responsibility of the Prime Contractor.

LIMITATIONS

Soils Engineering is one of the newest divisions of Civil Engineering. This branch of Civil Engineering is constantly improving as new technologies and understanding of earth sciences advance. Although your site was analyzed using the most appropriate and most current techniques and methods, undoubtedly there will be substantial future improvements in this branch of engineering. In addition to advancements in the field of Soils Engineering, physical changes in the site, either due to excavation or fill placement, new agency regulations, or possible changes in the proposed structure after the soils report is completed may require the soils report to be professionally reviewed. In light of this, the Owner should be aware that there is a practical limit to the usefulness of this report without critical review. Although the time limit for this review is strictly arbitrary, it is suggested that 2 years be considered a reasonable time for the usefulness of this report.

Foundation and earthwork construction is characterized by the presence of a calculated risk that soil and groundwater conditions have been fully revealed by the original foundation investigation. This risk is derived from the practical necessity of basing interpretations and design conclusions on limited sampling of the earth. The recommendations made in this report are based on the assumption that soil conditions do not vary significantly from those disclosed during our field investigation. If any variations or undesirable conditions are encountered during construction, the Soils Engineer should be notified so that supplemental recommendations may be made.

The conclusions of this report are based on the information provided regarding the proposed construction. If the proposed construction is relocated or redesigned, the conclusions in this report may not be valid. The Soils Engineer should be notified of any changes so the recommendations may be reviewed and re-evaluated.

This report is a Geotechnical Engineering Investigation with the purpose of evaluating the soil conditions in terms of foundation design. The scope of our services did not include any Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands. Any statements, or absence of statements, in this report or on any boring log regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices and a degree of conservatism deemed proper for this project. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (559) 348-2200.

Respectfully submitted,
KRAZAN & ASSOCIATES, INC.

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CEG No. 2146

David R. Jarosz, II
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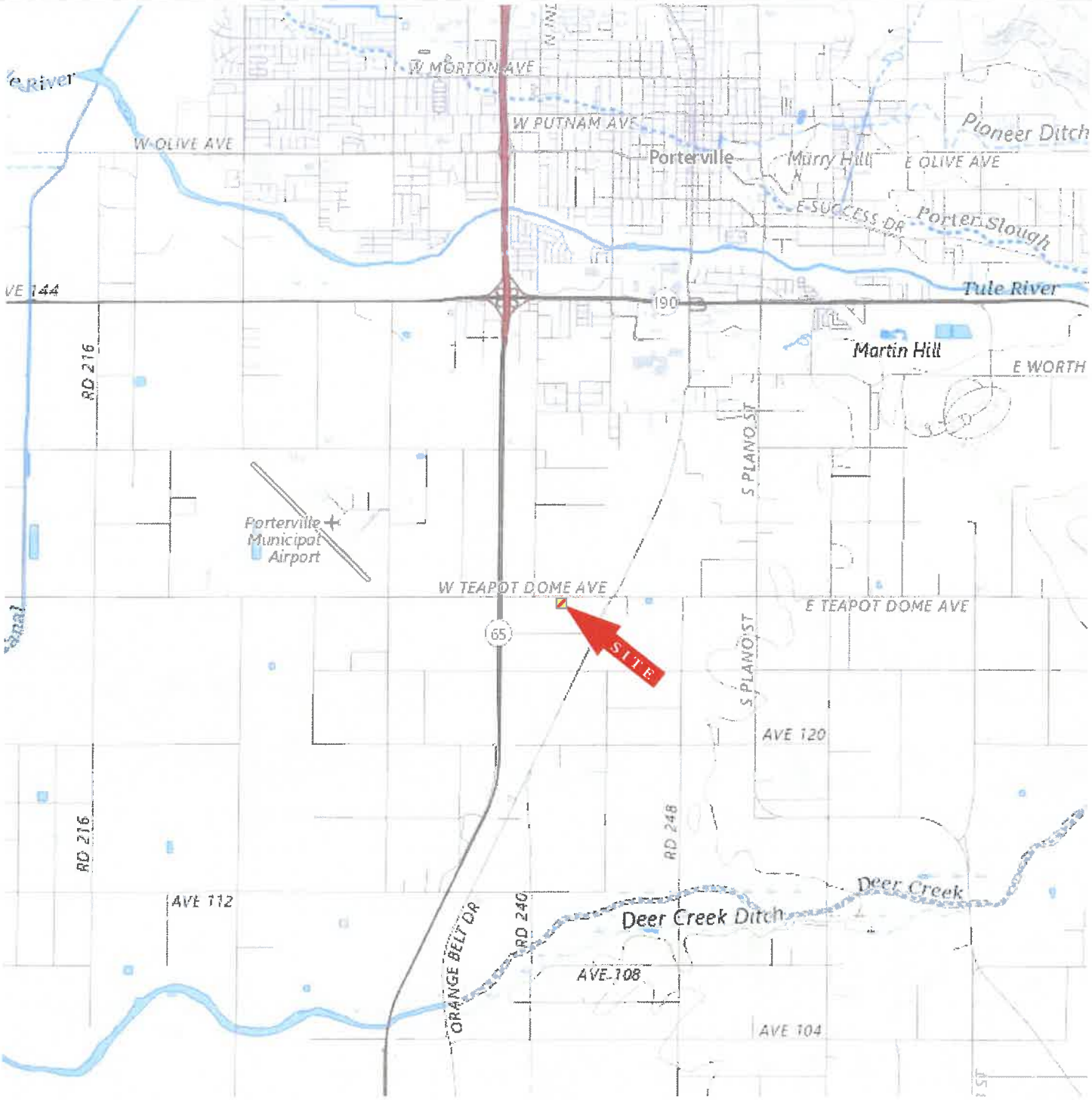
SJN/DRJ:wa



VICINITY MAP

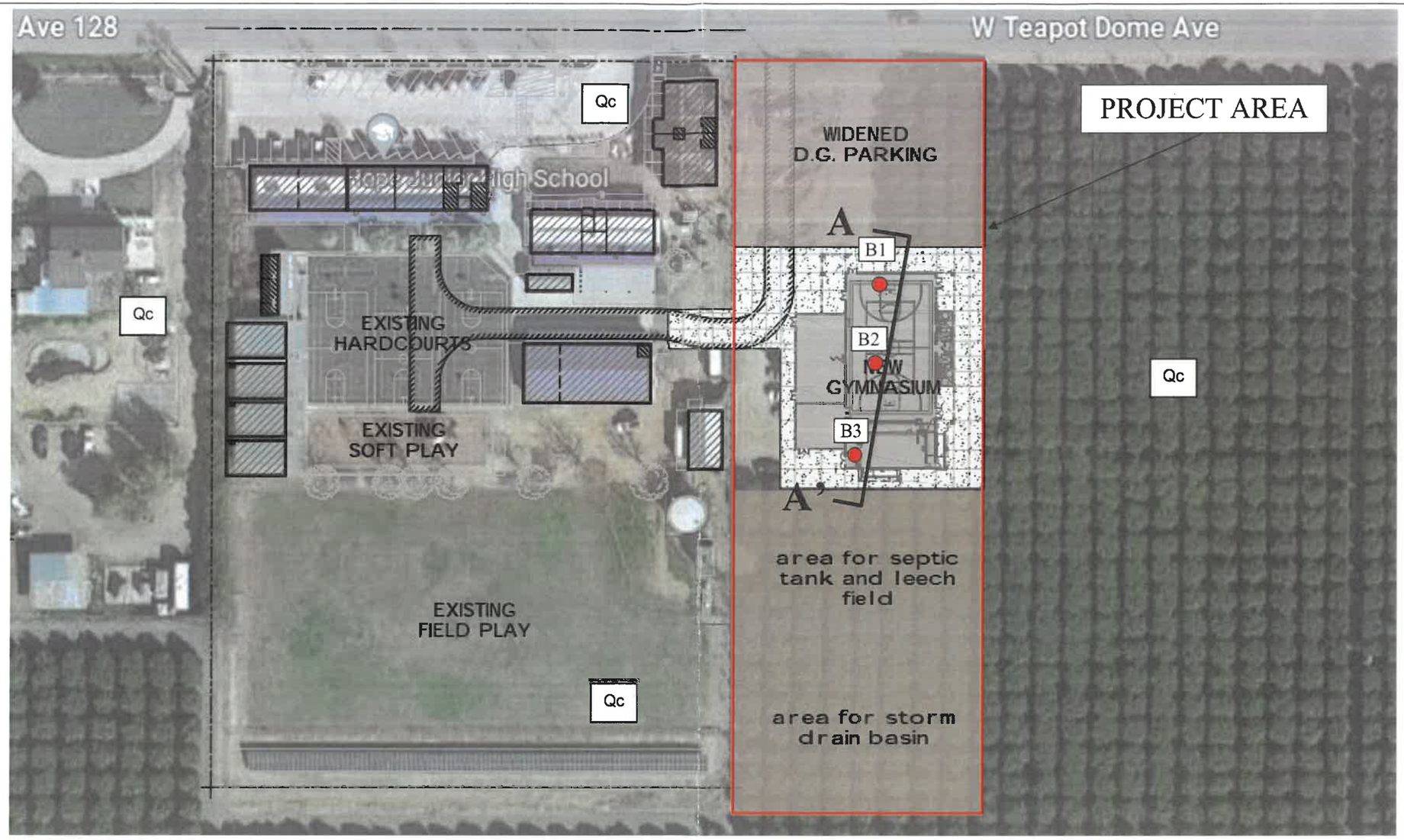
MAP SOURCE:
U.S.G.S. TOPOZONE, TULARE COUNY
PORTERVILLE AREA
HTTPS://WWW.TOPOZONE.COM

NORTH

0 1 2

SCALE IN MILES (±)

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 1	



BORING LOCATION

A A' CROSS-SECTION LOCATION (A-A')

Qc PLEISTOCENE NONMARINE

N W E S

0' 80'

MAP BY: MANGINI ASSOCIATES, INC

SITE GEOLOGIC MAP	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Drawn by:** WA	**Approved by:** DJ	
	Project No. 012-23205	**Figure No.** 2	

Qc -PLEISTOCENE NONMARINE

-PROJECT AREAS

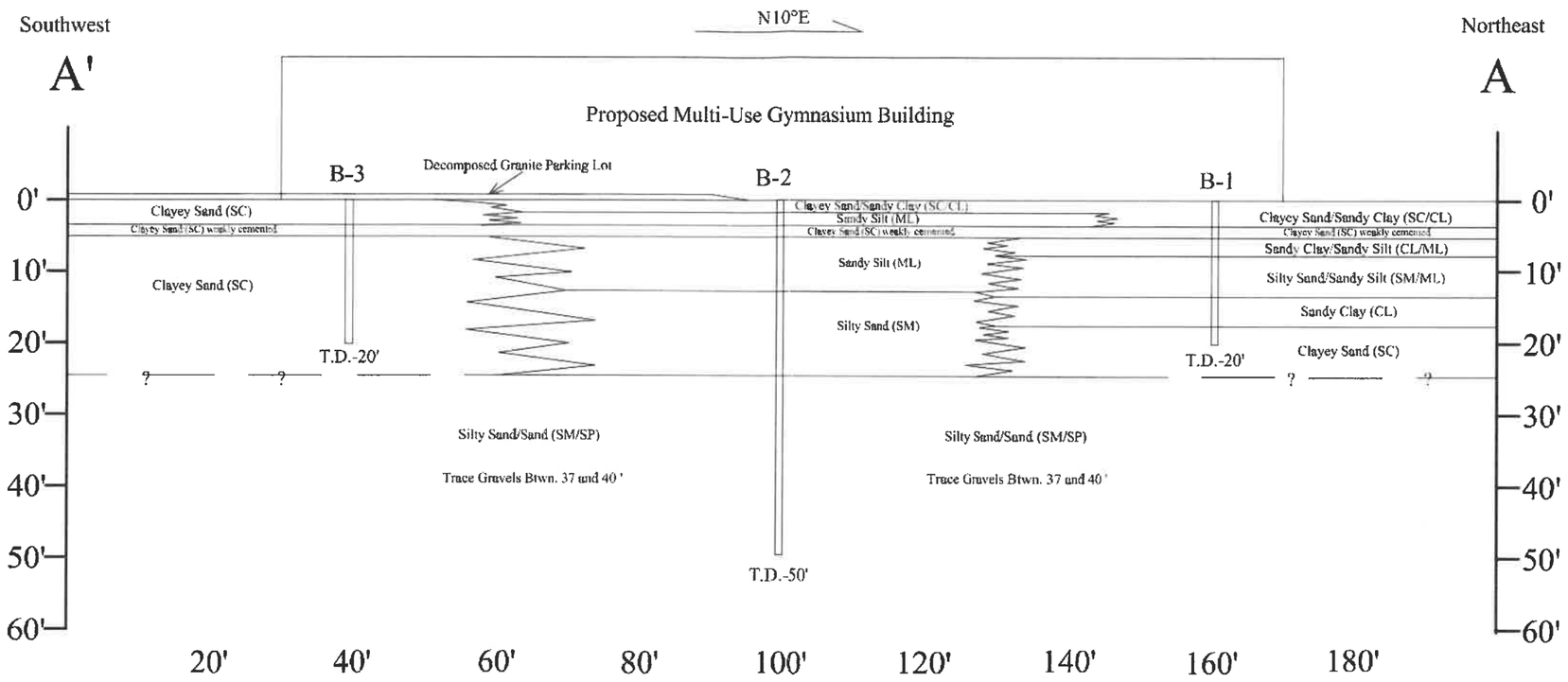
MAP BY: MANGINI ASSOCIATES, INC

0’ 100’

N
W E
S

SITE MAP	**Scale:** As Shown	**Date:** November 2023
GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Drawn by:** WA **Project No.** 012-23205	**Approved by:** DJ **Figure No.** 2.1

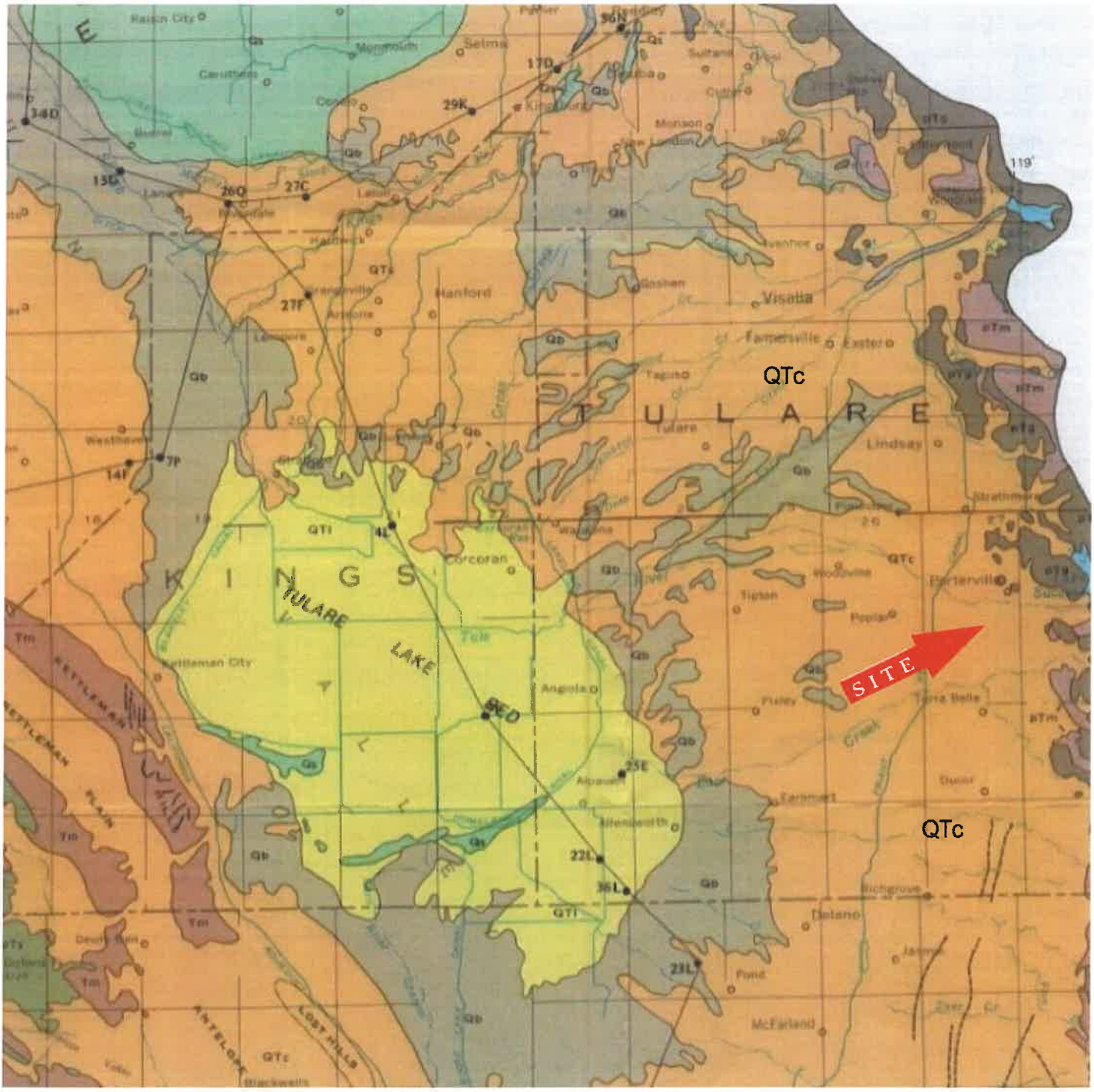
Krazan
GEOTECHNICAL ENGINEERING



SITE GEOLOGIC CROSS SECTION A-A'

0' 20'

GEOTECHNICAL ENGINEERING INVESTIGATION	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
HOPE ELEMENTARY SCHOOL 613 W. Teapot Dome Avenue Porterville, California	**Drawn by:** WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 3	



REGIONAL GEOLOGIC MAP

FROM:
GEOLOGIC MAP OF THE SAN JOAQUIN VALLEY,
TULARE, KINGS, KERN, AND FRESNO COUNTIES,
CALIFORNIA.
COMPILATION BY R.W. PAGE, 1985

NORTH

0 8 16

SCALE IN MILES (±)

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 4	

DESCRIPTION OF MAP UNITS

Qs **Sand dunes (Holocene)** Windblown sand and dune sand

Qb **Flood-basin deposits (Holocene)** Clay, silt, and some sand; near Stockton consist of muck, peat, and other organic soils. In places may include part of the Modesto Formation (Pleistocene)

Qr **River deposits (Holocene)** Gravel, sand, silt, and minor amounts of clay; deposited along channels, flood plains, and natural levees of main streams. In places may include part of Modesto Formation (Pleistocene)

QTl **Lacustrine and marsh deposits (Pliocene to Holocene)** Clay, silt, and some sand; in subsurface include three widespread clays: A clay (Pleistocene and Holocene?); C clay (Pleistocene); and modified E clay (Pleistocene), includes Corcoran Clay Member of Tulare and Turlock Lake Formations

QTc **Continental rocks and deposits (Miocene to Holocene)** Heterogeneous mix of generally poorly sorted clay, silt, sand, and gravel; some beds of claystone, siltstone, sandstone, and conglomerate. Include some informal units: younger alluvium (Holocene), older alluvium (Pleistocene and Holocene?) and continental deposits (Pliocene and Pleistocene); three formations of Pleistocene age: Modesto, Riverbank, and Turlock Lake; Tulare Formation (Pliocene and Pleistocene) on western side of valley, Laguna Formation (Pliocene) on eastern side, and Kern River Formation (Miocene to Pleistocene?) on southeastern part

Tvd **Volcanic rocks and deposits (Miocene and Pliocene)** Massive tuff with large fragments of vesicular basalt northwest of Tracy; tuff, and volcanic breccia at south end of valley

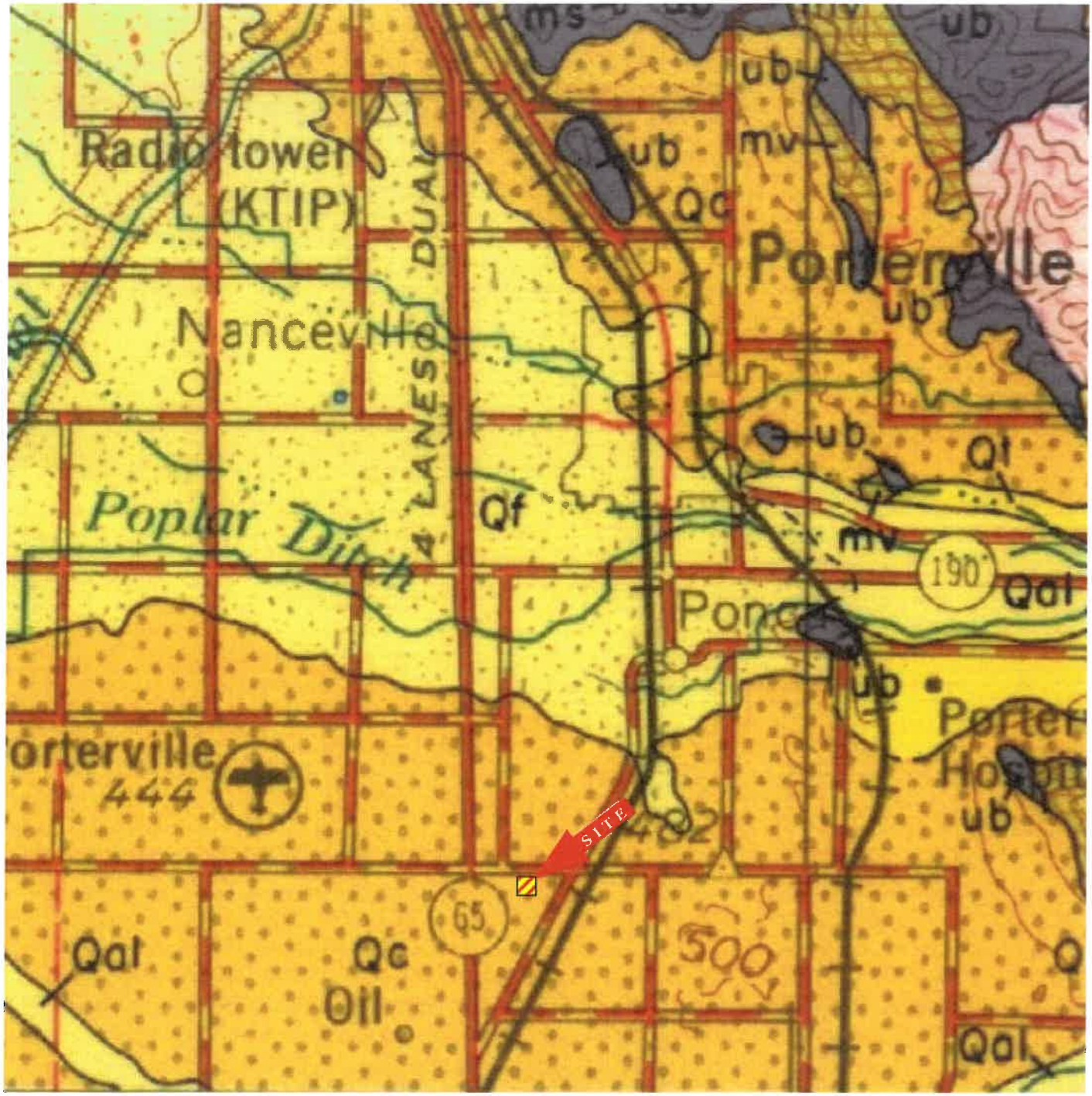
Tcpm **Continental rocks and deposits (Miocene and Pliocene)** Gravel, sand, silt, clay, conglomerate, sandstone, siltstone, and claystone, contain andesitic material. Principally Mehrten Formation (Miocene and Pliocene) on eastern side of valley; include continental equivalents of Etchegoin Formation (Miocene and Pliocene) on western side of valley, and Chanac Formation (Miocene) on southern part

Tcmd **Continental and marine rocks and deposits (Miocene and Pliocene)** Gravel, sand, silt, clay, silty sandstone, and siltstone. Include continental and marine equivalents of San Joaquin Formation (Pliocene) and Etchegoin Formation (Miocene and Pliocene)

REGIONAL GEOLOGIC MAP
EXPLANATION

FROM:
GEOLOGIC MAP OF THE SAN JOAQUIN VALLEY,
TULARE, KINGS, KERN, AND FRESNO COUNTIES,
CALIFORNIA.
COMPILATION BY R.W. PAGE, 1985

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23164	**Figure No.** 4a	



LOCAL GEOLOGIC MAP

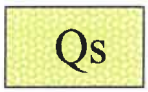
FROM:
GEOLOGIC MAP OF CALIFORNIA, FRESNO SHEET,
OLAF P. JENKINS EDITION
COMPILATION BY: ROBERT A. MATTHEWS AND
JOHN L. BURNETT, 1965

NORTH

0 1 2

SCALE IN MILES (±)

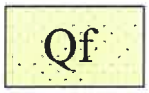
GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 5	



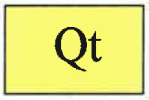
Sand Dunes (Holocene)

Alluvium (Holocene)

Stream Channel Deposits (Holocene)



Fan Deposits (Holocene)



Nonmarine Terrace Deposits (Quaternary)

Pleistocene Nonmarine (Pleistocene)

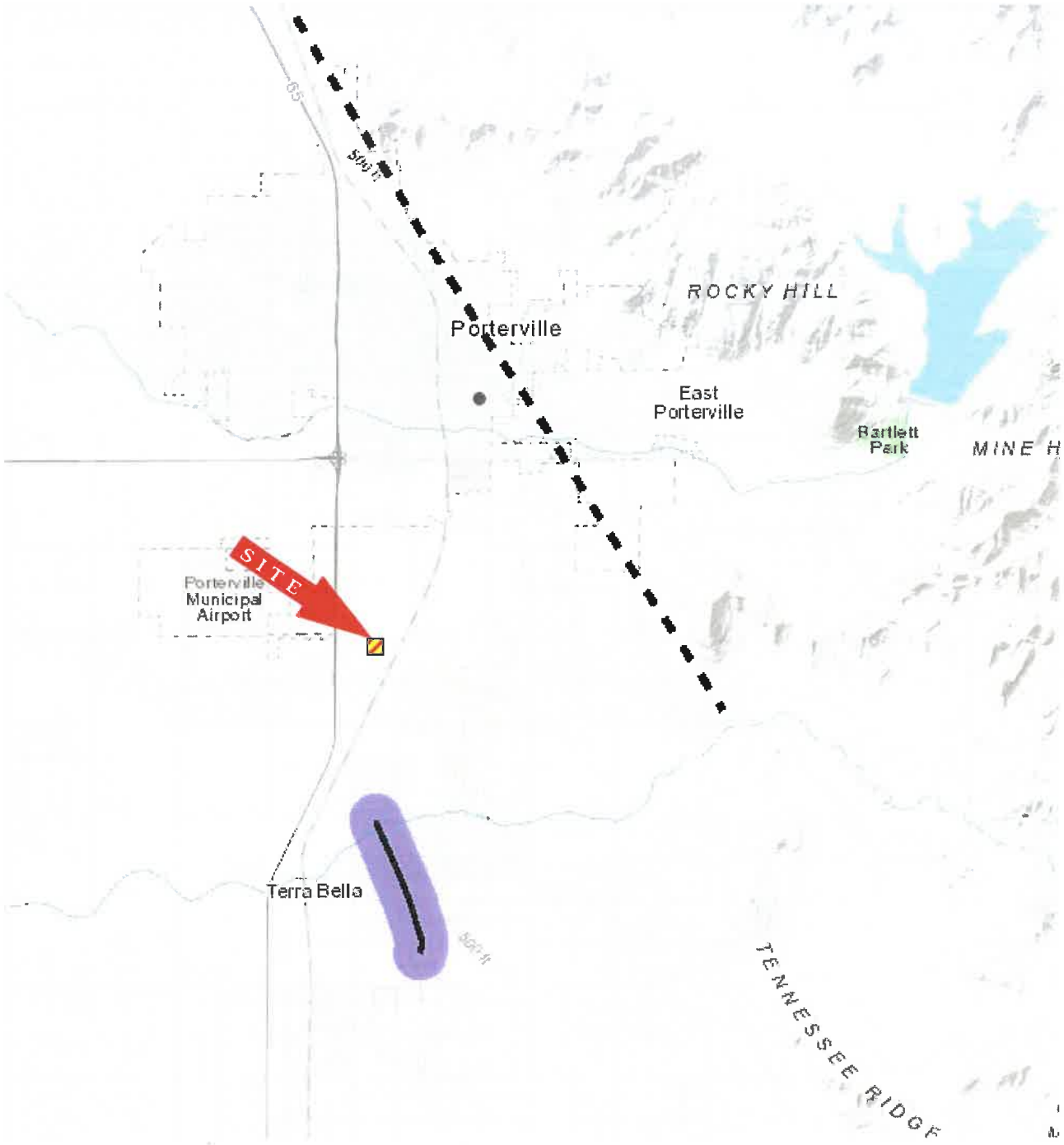
Ultrabasic Intrusive Rocks (Mesozoic)

Metavolcanic Rocks (Pre-Cretaceous)

LOCAL GEOLOGIC MAP EXPLANATION

FROM:
GEOLOGIC MAP OF CALIFORNIA, FRESNO SHEET,
OLAF P. JENKINS EDITION COMPILATION BY:
COMPILATION BY: ROBERT A. MATTHEWS AND
JOHN L. BURNETT, 1965

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 5a	



NOTES:

PREPARED FROM THE C.G.S. "FAULT ACTIVITIY MAP OF CALIFORNIA" JENNINGS AND BRYANT, 2010

FAULT TRACES ON LAND ARE INDICATED BY SOLID LINES WHERE WELL LOCATED, BY DASHED LINES WHERE CONCEALED BY YOUNGER ROCKS OR BY LAKES OR BAYS. FAULT TRACES ARE QUERIED WHERE CONTINUATION OR EXISTENCE IS UNCERTAIN.

FAULT ACTIVITY MAP

NORTH

0 2 4

SCALE IN MILES (±)

GEOTECHNICAL ENGINEERING INVESTIGATION
HOPE ELEMENTARY SCHOOL
613 W. Teapot Dome Avenue
Porterville, California

Scale: As Shown	**Date:** November 2023
Drawn by: WA	**Approved by:** SN
Project No. 012-23205	**Figure No.** 6

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Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.

(c) displaced survey lines.

A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

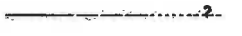
No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.



Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissnce nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

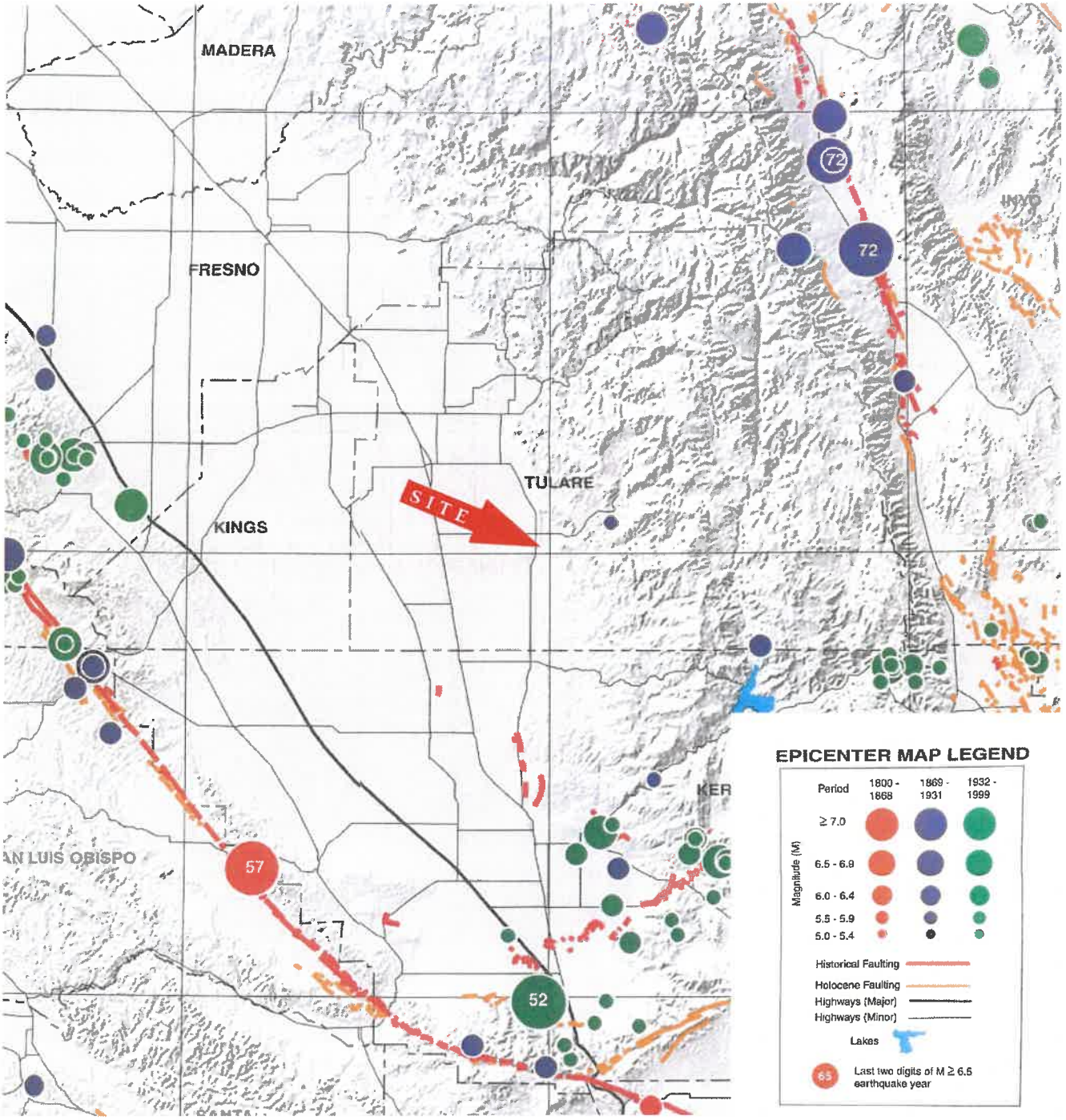
FAULT ACTIVITY MAP
EXPLANATION

NOTES:

PREPARED FROM THE C.G.S. "FAULT ACTIVITIY MAP OF CALIFORNIA" JENNINGS AND BRYANT, 2010

FAULT TRACES ON LAND ARE INDICATED BY SOLID LINES WHERE WELL LOCATED, BY DASHED LINES WHERE CONCEALED BY YOUNGER ROCKS OR BY LAKES OR BAYS. FAULT TRACES ARE QUERIED WHERE CONTINUATION OR EXISTENCE IS UNCERTAIN.

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 6a	



MAP SOURCE:
CGS MAP SHEET 49
EPICENTERS OF AND AREAS
DAMAGED BY M > 5 CALIFORNIA
EARTHQUAKES, 1800-1999
BY TOPPOZADA, BRANUM, PETERSEN,
HALLSTROM, CRAMER & REICHLE, 2000

EPICENTER MAP

NORTH

0 24 48

SCALE IN MILES (±)

GEOTECHNICAL ENGINEERING INVESTIGATION
HOPE ELEMENTARY SCHOOL
613 W. Teapot Dome Avenue
Porterville, California

Scale: As Shown	**Date:** November 2023
Drawn by: WA	**Approved by:** SN
Project No. 012-23205	**Figure No.** 7

Krazan
GEOTECHNICAL ENGINEERING

PROJECT AREA

GYMNASIUM AREA

AERIAL PHOTO

NORTH

0’ 100’ 200’

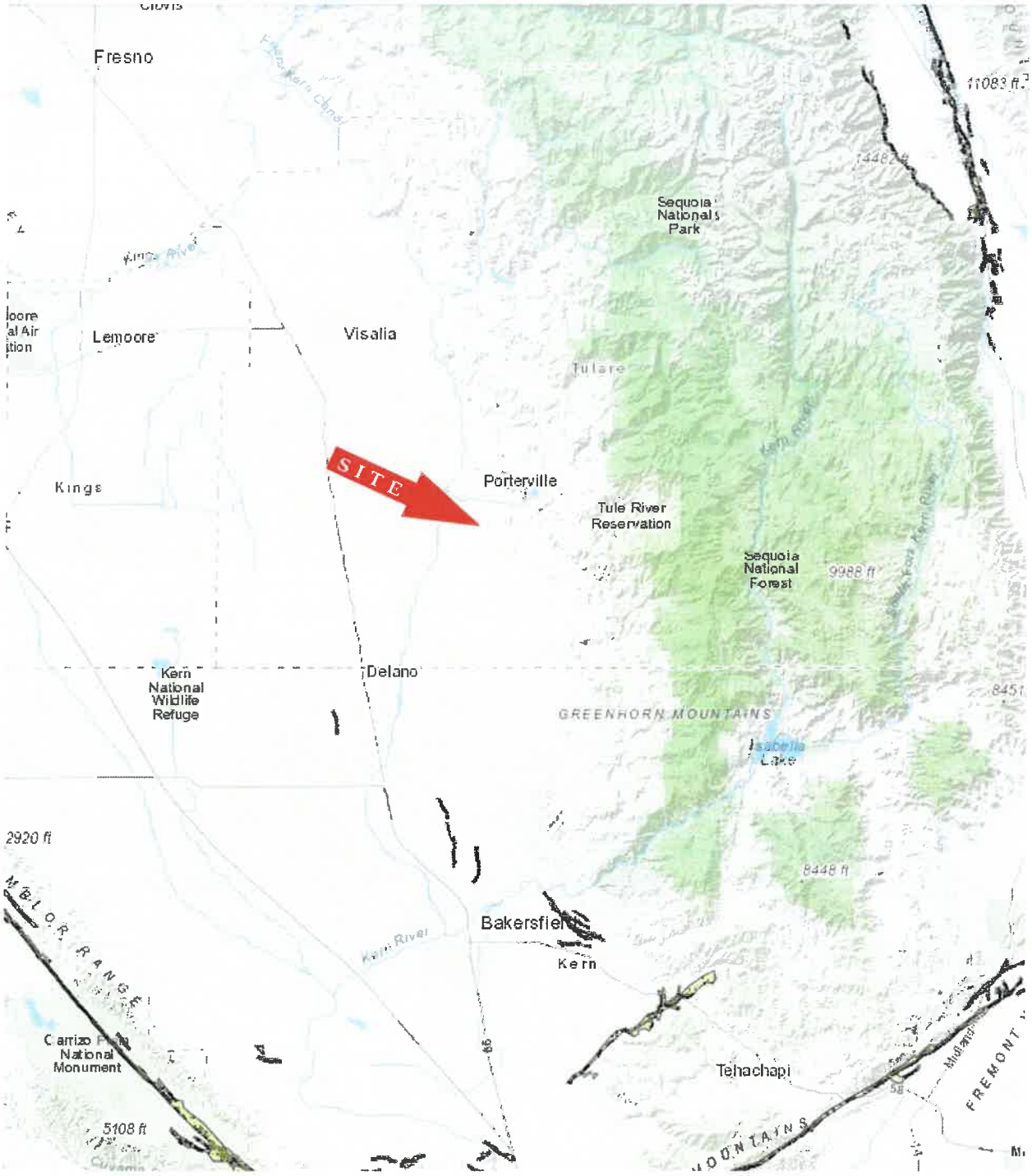
SCALE IN FEET (±)

FROM:
GOOGLE EARTH PRO, 2022

GEOTECHNICAL ENGINEERING INVESTIGATION
HOPE ELEMENTARY SCHOOL
613 W. Teapot Dome Avenue
Porterville, California

Scale: As Shown	**Date:** November 2023
Drawn by: WA	**Approved by:** SN
Project No. 012-23205	**Figure No.** 8

Krazan
GEOTECHNICAL ENGINEERING



EARTHQUAKE ZONES OF REQUIRED INVESTIGATION (FAULTS)

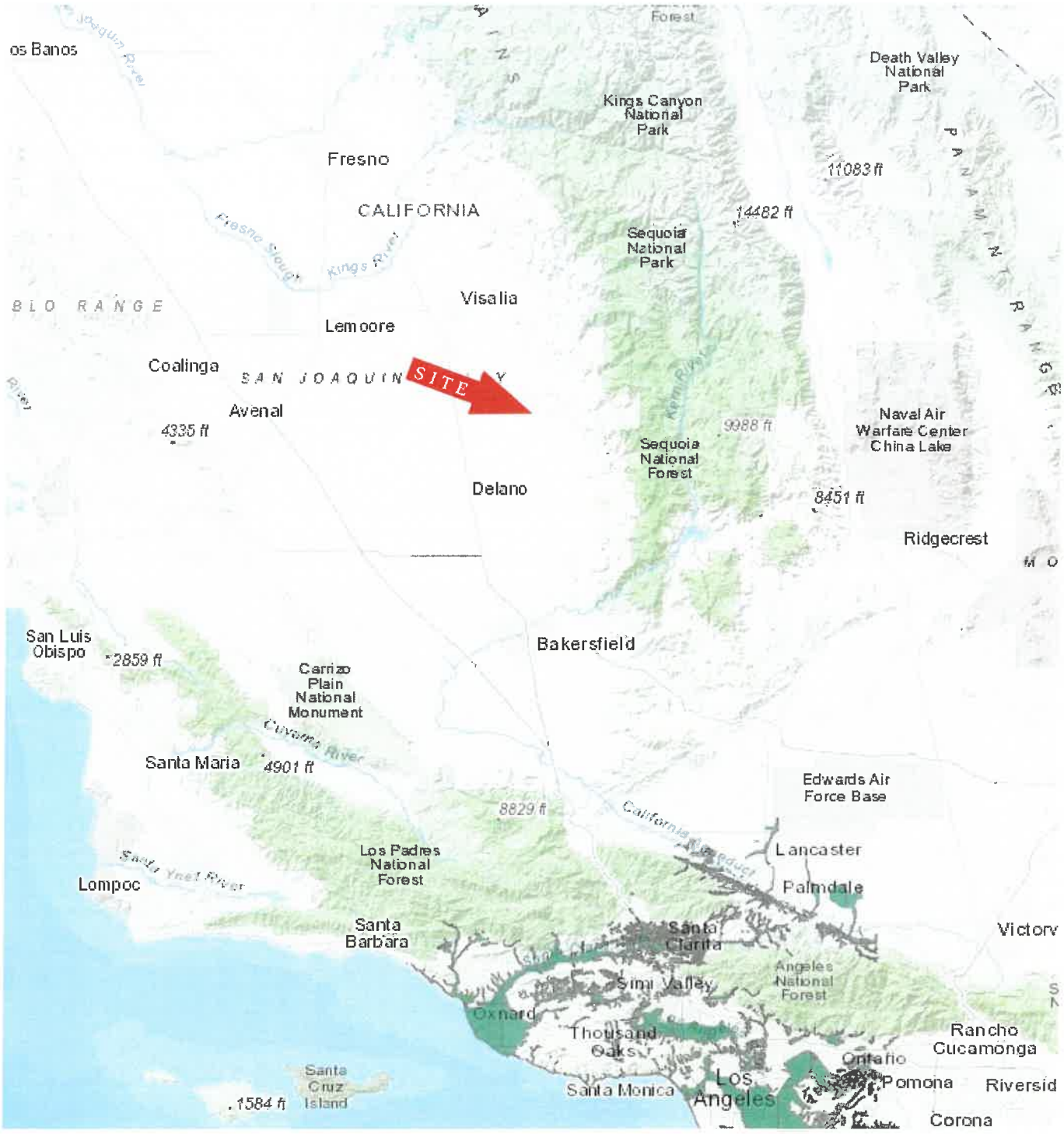
NORTH

0 15 30

SCALE IN MILES (±)

MAP SOURCE:
Earthquake Fault Zones and Seismic Hazard Zones.
By John Parrish, PhD., State Geologist, 2003

GEOTECHNICAL ENGINEERING INVESTIGATION HOPE ELEMENTARY SCHOOL 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 9	



EARTHQUAKE ZONES OF REQUIRED INVESTIGATION

(NO LIQUEFACTION MAPS AVAILABLE IN SITE VICINITY)

NORTH

0 30 60

SCALE IN MILES (±)

MAP SOURCE:

Earthquake Fault Zones and Seismic Hazard Zones.
By John Parrish, PHD., State Geologist, 2003

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown **Drawn by:** WA **Project No.** 012-23205	**Date:** November 2023 **Approved by:** SN **Figure No.** 10

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Earthquake Zones of Required Investigation

This Map Shows Both Alquist-Priolo Earthquake Fault Zones And Seismic Hazard Zones

This map shows the location of Alquist-Priolo (AP) Earthquake Fault Zones and Seismic Hazard Zones, collectively referred to here as Earthquake Zones of Required Investigation. The Geographic Information System (GIS) digital files of these regulatory zones released by the California Geological Survey (CGS) are the "Official Maps." GIS files are available at the CGS website http://maps.conservation.ca.gov/cgs/informationwarehouse/. These zones will assist cities and counties in fulfilling their responsibilities for protecting the public from the effects of surface fault rupture and earthquake-triggered ground failure as required by the AP Earthquake Fault Zoning Act (Public Resources Code Sections 2621-2630) and the Seismic Hazards Mapping Act (Public Resources Code Sections 2690-2699.6). For information regarding the general approach and recommended methods for preparing these zones, see CGS Special Publication 42, *Earthquake Fault Zones, a Guide for Government Agencies, Property Owners/Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California*, Appendix C, and CGS Special Publication 118, *Recommended Criteria for Delineating Seismic Hazard Zones in California*.

For information regarding the scope and recommended methods to be used in conducting required site investigations refer to CGS Special Publication 42, and CGS Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. For a general description of the AP and Seismic Hazards Mapping acts, the zonation programs, and related information, please refer to the website at www.conservation.ca.gov/cgs/

MAP EXPLANATION

EARTHQUAKE FAULT ZONES

Earthquake Fault Zones
Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Section 2621.5(a) would be required.

Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture: Solid Line in Black or Red where Accurately Located; Long Dash in Black or Solid Line in Purple where Approximately Located; Short Dash in Black or Solid Line in Orange where Inferred; Dotted Line in Black or Solid Line in Rose where Concealed; Query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or C for displacement caused by fault creep.

SEISMIC HAZARD ZONES

Liquefaction Zones
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones
Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

OVERLAPPING EARTHQUAKE FAULT AND SEISMIC HAZARD ZONES

Overlap of Earthquake Fault Zone and Liquefaction Zone
Areas that are covered by both Earthquake Fault Zone and Liquefaction Zone.

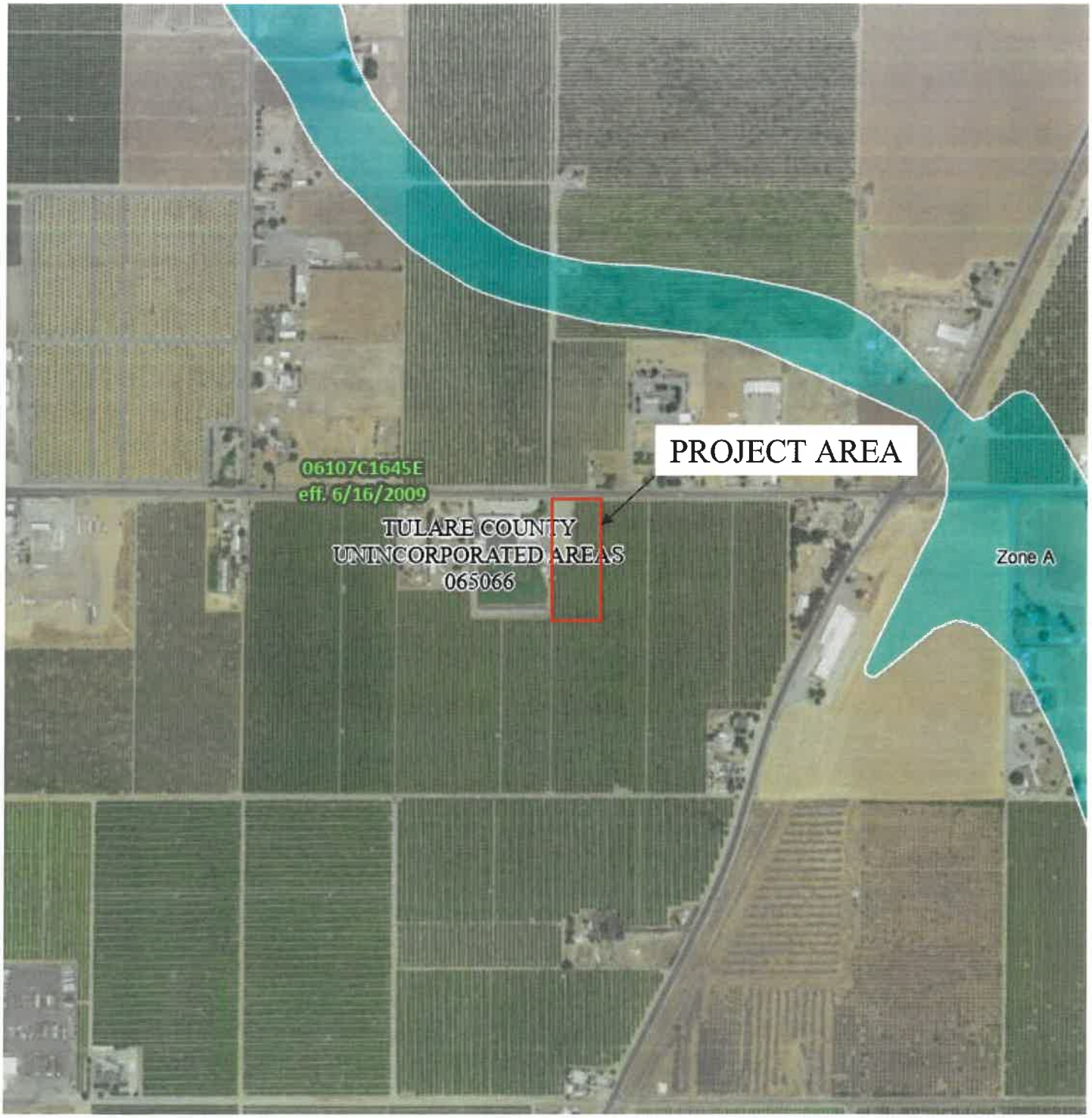
Overlap of Earthquake Fault Zone and Earthquake-Induced Landslide Zone
Areas that are covered by both Earthquake Fault Zone and Earthquake-Induced Landslide Zone.

Note: Mitigation methods differ for each zone –
AP Act only allows avoidance; Seismic Hazard Mapping Act allows mitigation by engineering/geotechnical design as well as avoidance.

EARTHQUAKE ZONES OF REQUIRED INVESTIGATION EXPLANATION

MAP SOURCE:
Earthquake Fault
Zones and Seismic Hazard Zones. Porterville Quadrangle
By John Parrish, PHD., State Geologist, 2003

GEOTECHNICAL ENGINEERING INVESTIGATION HOPE ELEMENTARY SCHOOL 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 10a	



FLOOD MAP

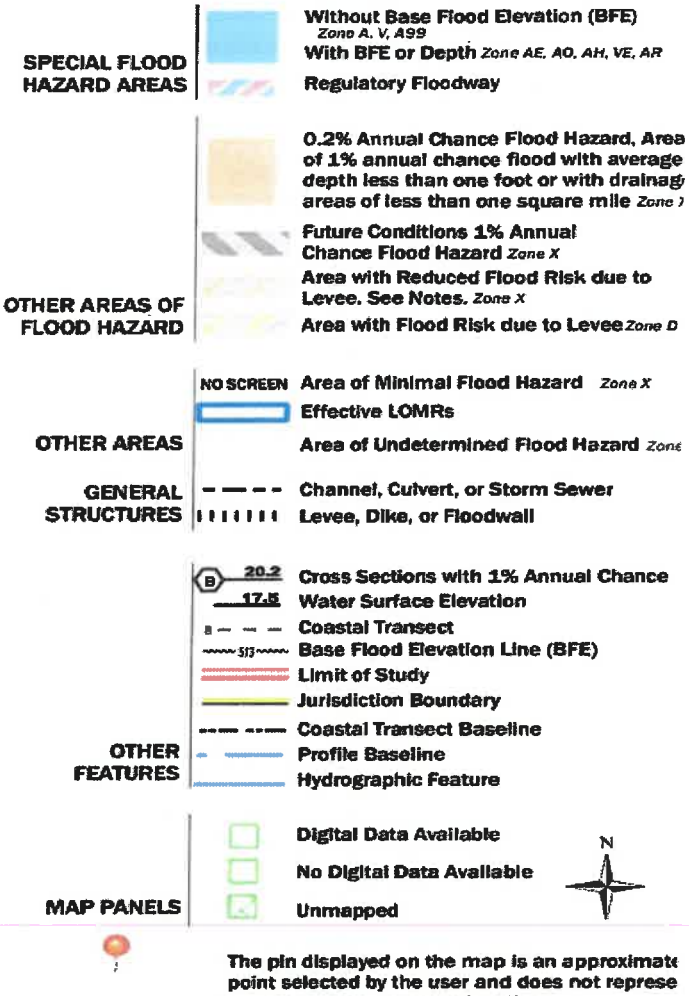
FEMA FLOOD INSURANCE MAP, 2019

NORTH

0' 600' 1,200'

SCALE IN FEET (±)

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 11	



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

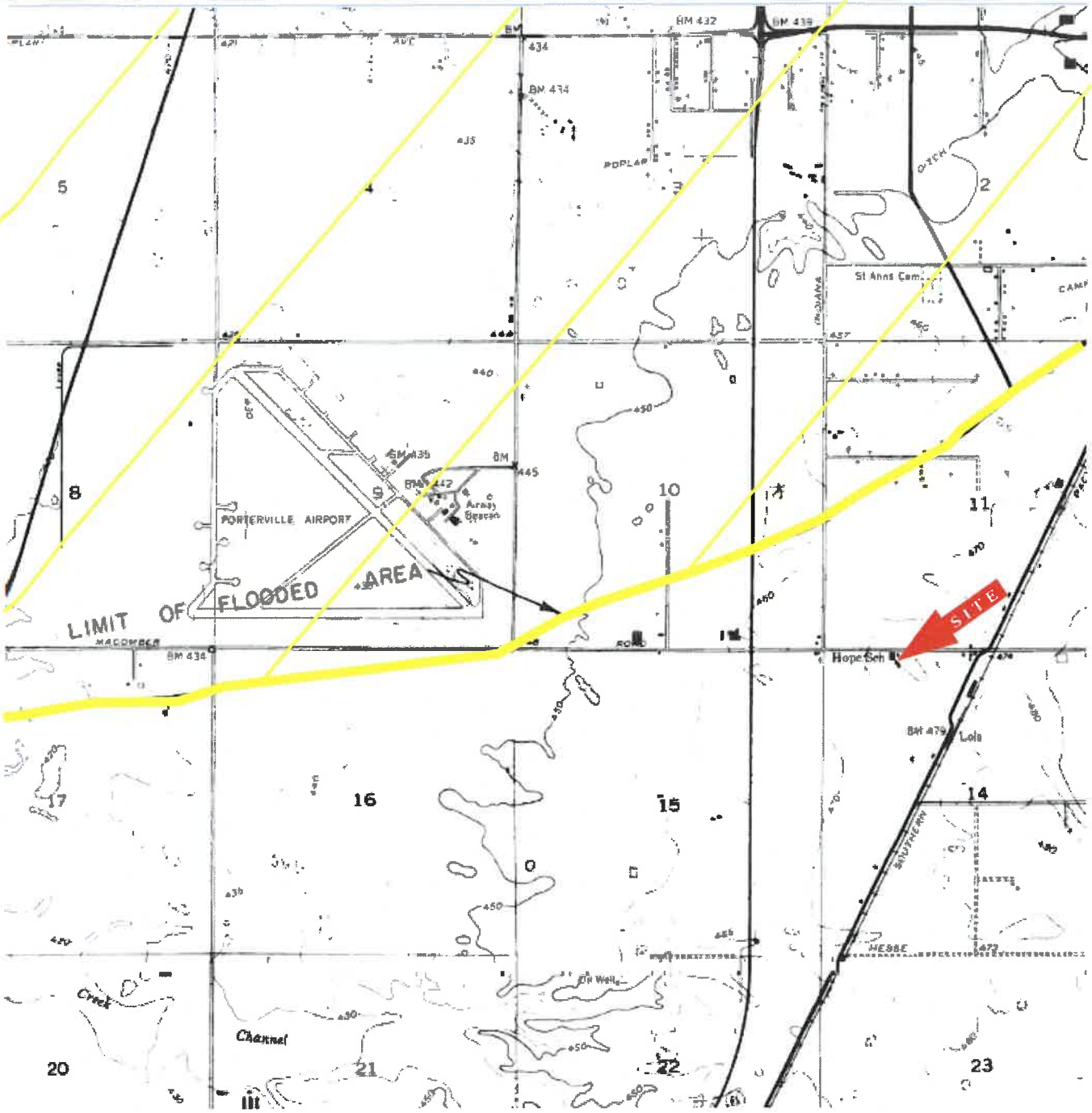
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/1/2021 at 1:53 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FLOOD MAP EXPLANATION

FEMA FLOOD INSURANCE MAP, 2019

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 11a	



INUNDATION LIMITS

FROM:
MAPPED, EDITED, AND PUBLISHED BY THE GEOLOGICAL SURVEY, CULTURE AND DRAINAGE COMPILED FROM AERIAL PHOTGRAPHS TAKEN 1952. TOPOGRAPHY BY PLANTABLE METHODS1954

DAM INUNDATION MAP
LAKE SUCCESS

NORTH

0 ½ 1

SCALE IN MILES (±)

GEOTECHNICAL ENGINEERING INVESTIGATION **HOPE ELEMENTARY SCHOOL** 613 W. Teapot Dome Avenue Porterville, California	**Scale:** As Shown	**Date:** November 2023	Krazan GEOTECHNICAL ENGINEERING
	Drawn by: WA	**Approved by:** SN	
	Project No. 012-23205	**Figure No.** 12	

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Distance in Miles	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
49.89	Great Valley 14 (Kettleman Hills)	CA	1.5	22	W	thrust	8.1	22	24
54.09	White Wolf	CA	2	75	S	reverse	0	14	63
57.63	So Sierra Nevada	CA	0.1	50	E	normal	0	14	112
60.74	Independence	CA	0.2	50	E	normal	0	15	48
61.27	Great Valley 13 (Coalinga)	CA	1.5	15	W	thrust	9.1	15	32
64.79	Little Lake	CA	0.7	90	V	strike slip	0	13	40
65.52	Owens Valley	CA	1.5	90	V	strike slip	0	14	86
67.40	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0.1	13	421
67.40	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0.1	13	377
67.40	S. San Andreas;PK+CH+CC+BB+NM+SM	CA	n/a	90	V	strike slip	0.1	13	342
67.40	S. San Andreas;CH+CC+BB	CA	n/a	90	V	strike slip	0	14	171
67.40	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	548
67.40	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0.1	13	479
67.40	S. San Andreas;PK+CH+CC+BB	CA	n/a	90	V	strike slip	0.1	12	208
67.40	S. San Andreas;PK+CH+CC	CA	n/a	90	V	strike slip	0.2	11	158
67.40	S. San Andreas;PK+CH	CA	n/a	90	V	strike slip	0.4	8	99
67.40	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0	14	442
67.40	S. San Andreas;CH+CC+BB+NM	CA	n/a	90	V	strike slip	0	14	208

67.40	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	14	384
67.40	S. San Andreas;CH+CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	341
67.40	S. San Andreas;PK+CH+CC+BB+NM	CA	n/a	90	V	strike slip	0.1	12	245
67.40	S. San Andreas;CH+CC	CA	n/a	90	V	strike slip	0	14	122
67.40	S. San Andreas;CH+CC+BB+NM+SM	CA	n/a	90	V	strike slip	0	14	306
67.40	S. San Andreas;CH	CA	34	90	V	strike slip	0	12	63
67.40	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
67.73	S. San Andreas;CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	85		strike slip	0	14	380
67.73	S. San Andreas;CC	CA	34	90	V	strike slip	0	15	59
67.73	S. San Andreas;CC+BB	CA	n/a	90	V	strike slip	0	15	109
67.73	S. San Andreas;CC+BB+NM	CA	n/a	90	V	strike slip	0	15	146
67.73	S. San Andreas;CC+BB+NM+SM	CA	n/a	90	V	strike slip	0	14	243
67.73	S. San Andreas;CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	279
67.73	S. San Andreas;CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	14	322
67.73	S. San Andreas;CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	449
69.93	Pleito	CA	2	46	S	reverse	0	14	44
73.60	S. San Andreas;PK	CA	34	90	V	strike slip	4	6	36
74.80	San Juan	CA	1	90	V	strike slip	0	13	68
75.97	Garlock;GW	CA	6	90	V	strike slip	0.7	14	98
75.97	Garlock;GC+GW	CA	n/a	90	V	strike slip	0.4	12	210

75.97	Garlock;GE+GC+GW	CA	n/a	90	V	strike slip	0.3	12	256
76.16	Garlock;GE+GC	CA	n/a	90	V	strike slip	0	12	156
76.16	Garlock;GC	CA	7	90	V	strike slip	0	12	111
76.32	Birch Creek	CA	0.7	50	E	normal	0	13	15
76.89	Great Valley 12	CA	1.5	15	W	thrust	7	10	17
77.20	S. San Andreas;BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	85		strike slip	0.1	13	390
77.20	S. San Andreas;BB	CA	34	90	V	strike slip	0	15	50
77.20	S. San Andreas;BB+NM	CA	n/a	90	V	strike slip	0	15	87
77.20	S. San Andreas;BB+NM+SM	CA	n/a	90	V	strike slip	0	14	184
77.20	S. San Andreas;BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	220
77.20	S. San Andreas;BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	14	263
77.20	S. San Andreas;BB+NM+SM+NSB+SSB+BG	CA	n/a	84		strike slip	0	14	321
80.54	Hunter Mountain Connected	CA	2.5	90	V	strike slip	0	13	186
84.07	S. San Andreas;NM	CA	27	90	V	strike slip	0	15	37
84.07	S. San Andreas;NM+SM	CA	n/a	90	V	strike slip	0	14	134
84.07	S. San Andreas;NM+SM+NSB	CA	n/a	90	V	strike slip	0	13	170
84.07	S. San Andreas;NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	13	213
84.07	S. San Andreas;NM+SM+NSB+SSB+BG	CA	n/a	83		strike slip	0	14	271
84.07	S. San Andreas;NM+SM+NSB+SSB+BG+CO	CA	n/a	84		strike slip	0.1	13	340
84.09	White Mountains	CA	1	90	V	strike slip	0	13	111
85.59	Great Valley 11	CA	1.5	15	W	thrust	7	10	24

85.73	San Andreas fault - creeping segment	CA	34	90	V	strike slip	0		125
87.52	Round Valley	CA	1	50	E	normal	0	13	43
89.88	Lenwood-Lockhart-Old Woman Springs	CA	0.9	90	V	strike slip	0	13	145
90.58	San Gabriel	CA	1	61	N	strike slip	0	15	71
94.93	Panamint Valley	CA	2.5	90	V	strike slip	0	13	110
95.87	S. San Andreas;SM+NSB+SSB	CA	n/a	90	V	strike slip	0	13	176
95.87	S. San Andreas;SM+NSB+SSB+BG+CO	CA	n/a	83		strike slip	0.1	13	303
95.87	S. San Andreas;SM+NSB+SSB+BG	CA	n/a	81		strike slip	0	13	234
95.87	S. San Andreas;SM	CA	29	90	V	strike slip	0	13	98
95.87	S. San Andreas;SM+NSB	CA	n/a	90	V	strike slip	0	13	133
96.91	Rinconada	CA	1	90	V	strike slip	0	10	191
98.98	Fish Slough	CA	0.2	50	E	normal	0	13	26
99.12	Blackwater	CA	0.5	90	V	strike slip	0	12	60
99.30	Deep Springs	CA	0.8	50	NW	normal	0	13	25
99.31	Great Valley 10	CA	1.5	15	W	thrust	7	10	22
99.38	Santa Ynez (East)	CA	2	70	S	strike slip	0	13	68
99.38	Santa Ynez Connected	CA	2	70		strike slip	0	11	132

APPENDIX A

FIELD AND LABORATORY INVESTIGATIONS

Field Investigation

The field investigation consisted of a surface reconnaissance and a subsurface exploratory program. Three 6½-inch exploratory borings were advanced. The boring locations are shown on the site plan.

The soils encountered were logged in the field during the exploration and with supplementary laboratory test data are described in accordance with the Unified Soil Classification System.

Modified standard penetration tests and standard penetration tests were performed at selected depths. These tests represent the resistance to driving a 2½-inch and 1½-inch diameter split barrel sampler, respectively. The driving energy was provided by a hammer weighing 140 pounds falling 30 inches. Relatively undisturbed soil samples were obtained while performing this test. Bag samples of the disturbed soil were obtained from the auger cuttings. The modified standard penetration tests are identified in the sample type on the boring logs with a full shaded in block. The standard penetration tests are identified in the sample type on the boring logs with half of the block shaded. All samples were returned to our Exeter laboratory for evaluation.

Laboratory Investigation

The laboratory investigation was programmed to determine the physical and mechanical properties of the foundation soil underlying the site. Test results were used as criteria for determining the engineering suitability of the surface and subsurface materials encountered.

In-situ moisture content, dry density, consolidation, direct shear, and sieve analysis tests were completed for the undisturbed samples representative of the subsurface material. Atterberg limits, expansion index and R-value tests were completed for select bag samples obtained from the auger cuttings. These tests, supplemented by visual observation, comprised the basis for our evaluation of the site material.

The logs of the exploratory borings and laboratory determinations are presented in this Appendix.

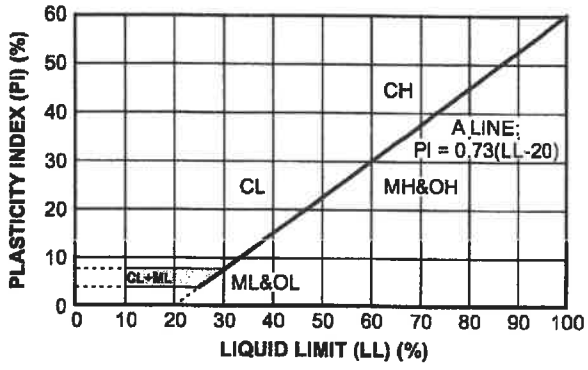
UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART			
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)		
		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)		
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)		
		SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)		
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

CONSISTENCY CLASSIFICATION	
Description	**Blows per Foot**
Granular Soils	
Very Loose	< 5
Loose	5 – 15
Medium Dense	16 – 40
Dense	41 – 65
Very Dense	> 65
Cohesive Soils	
Very Soft	< 3
Soft	3 – 5
Firm	6 – 10
Stiff	11 – 20
Very Stiff	21 – 40
Hard	> 40

GRAIN SIZE CLASSIFICATION		
Grain Type	*Standard Sieve Size*	*Grain Size in Millimeters*
Boulders	Above 12 inches	Above 305
Cobbles	12 to 13 inches	305 to 76.2
Gravel	3 inches to No. 4	76.2 to 4.76
Coarse-grained	3 to ¾ inches	76.2 to 19.1
Fine-grained	¾ inches to No. 4	19.1 to 4.76
Sand	No. 4 to No. 200	4.76 to 0.074
Coarse-grained	No. 4 to No. 10	4.76 to 2.00
Medium-grained	No. 10 to No. 40	2.00 to 0.42
Fine-grained	No. 40 to No. 200	0.42 to 0.074
Silt and Clay	Below No. 200	Below 0.074

PLASTICITY CHART



Log of Boring B1

Project: Hope ES - New Multi-Use Gym Building | **Project No:** 012-23205

Client: Hope Elementary School District | **Figure No.:** A-1

Location: 613 W. Teapot Dome Avenue, Porterville, California | **Logged By:** Wayne Andrade

Depth to Water> | **Initial:** None | **At Completion:** None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
		Ground Surface				
0		***CLAYEY SAND/SANDY CLAY (SC/CL)*** Very loose, fine- to medium-grained; brown, moist, drills easily	104.5	8.2		62
2		Dense and drills firmly below 6 inches Medium dense and light brown below 2 feet	106.7	7.1		26
4		***CLAYEY SILT (ML)*** Very dense, weakly cemented; brown, damp, drills hard				
6		***SANDY CLAY (CL)*** Very stiff, fine-grained; brown, moist, drills easily	102.4	20.8		36
8		***SILTY SAND/SANDY SILT (SM/ML)*** Medium dense, fine-grained; brown, moist, drills easily				
10				11.0		19
12						
14		***SANDY CLAY (CL)*** Hard, fine-grained; brown, damp, drills firmly				
16				12.3		43
18		***CLAYEY SAND (SC)*** Dense, fine- to medium-grained; brown, damp, drills firmly				
20						

Penetration Test blows/ft: 20 40 60

Water Content (%): 10 20 30 40

Drill Method: Hollow Stem | **Drill Date:** 10-17-23

Drill Rig: CME B80 | **Krazan and Associates** | **Hole Size:** 6½ Inches

Driller: David Lopez | **Elevation:** 21 Feet

Log of Boring B1

Project: Hope ES - New Multi-Use Gym Building

Project No: 012-23205

Client: Hope Elementary School District

Figure No.: A-1

Location: 613 W. Teapot Dome Avenue, Porterville, California

Logged By: Wayne Andrade

Depth to Water>

Initial: None

At Completion: None

SUBSURFACE PROFILE			SAMPLE				Penetration Test blows/ft	Water Content (%)
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.	20 40 60	10 20 30 40
				15.8		33		
		End of Borehole						
22								
24								
26								
28								
30								
32								
34								
36								
38								
40								

Drill Method: Hollow Stem

Drill Date: 10-17-23

Drill Rig: CME B80

Krazan and Associates

Hole Size: 6½ Inches

Driller: David Lopez

Elevation: 21 Feet

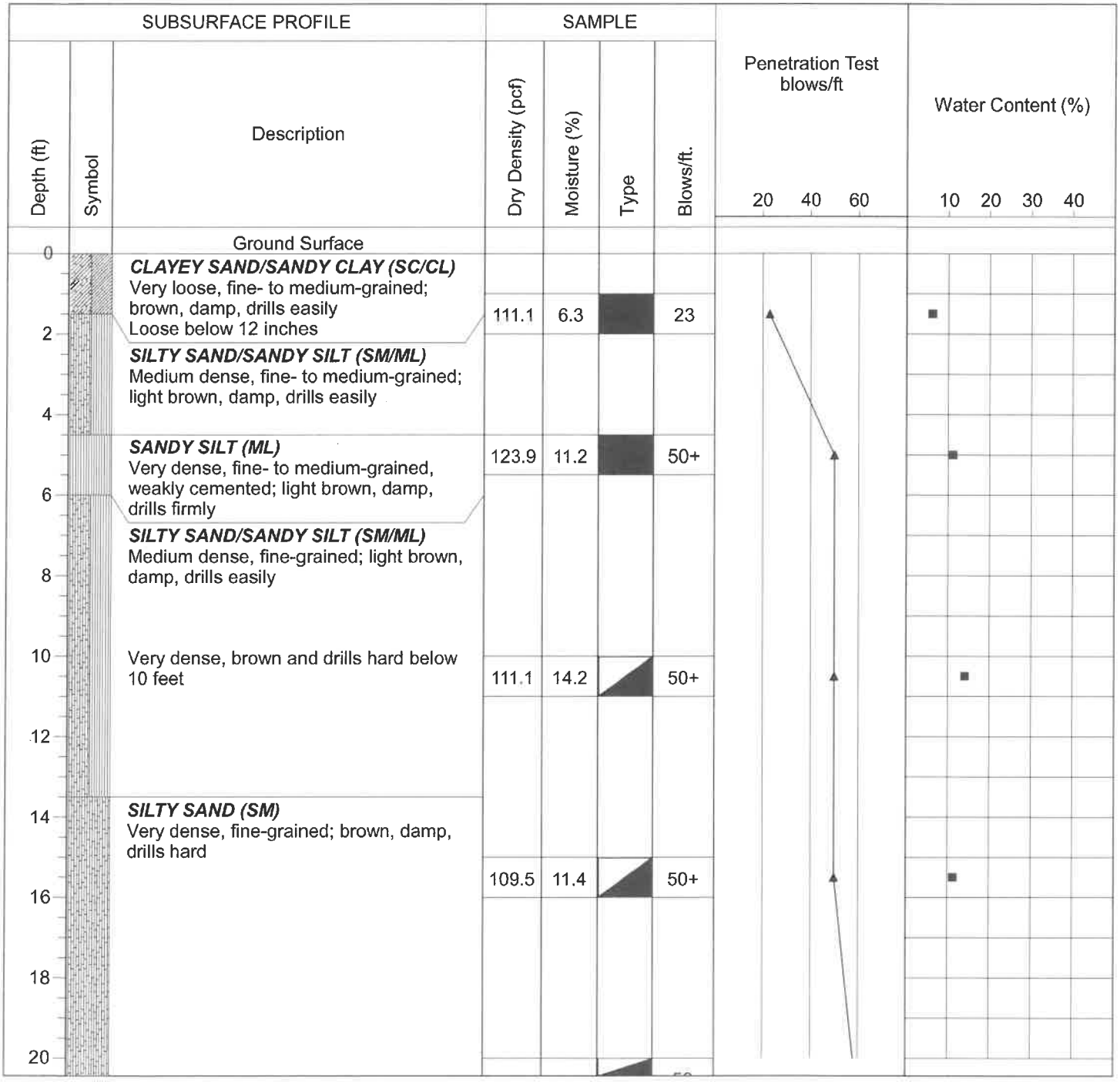
Log of Boring B2

Project: Hope ES - New Multi-Use Gym Building | **Project No:** 012-23205

Client: Hope Elementary School District | **Figure No.:** A-2

Location: 613 W. Teapot Dome Avenue, Porterville, California | **Logged By:** Wayne Andrade

Depth to Water> | **Initial:** None | **At Completion:** None



Drill Method: Hollow Stem | **Drill Date:** 10-17-23

Drill Rig: CME B80 | **Hole Size:** 6½ Inches

Driller: David Lopez | **Elevation:** 50 Feet

Krazan and Associates

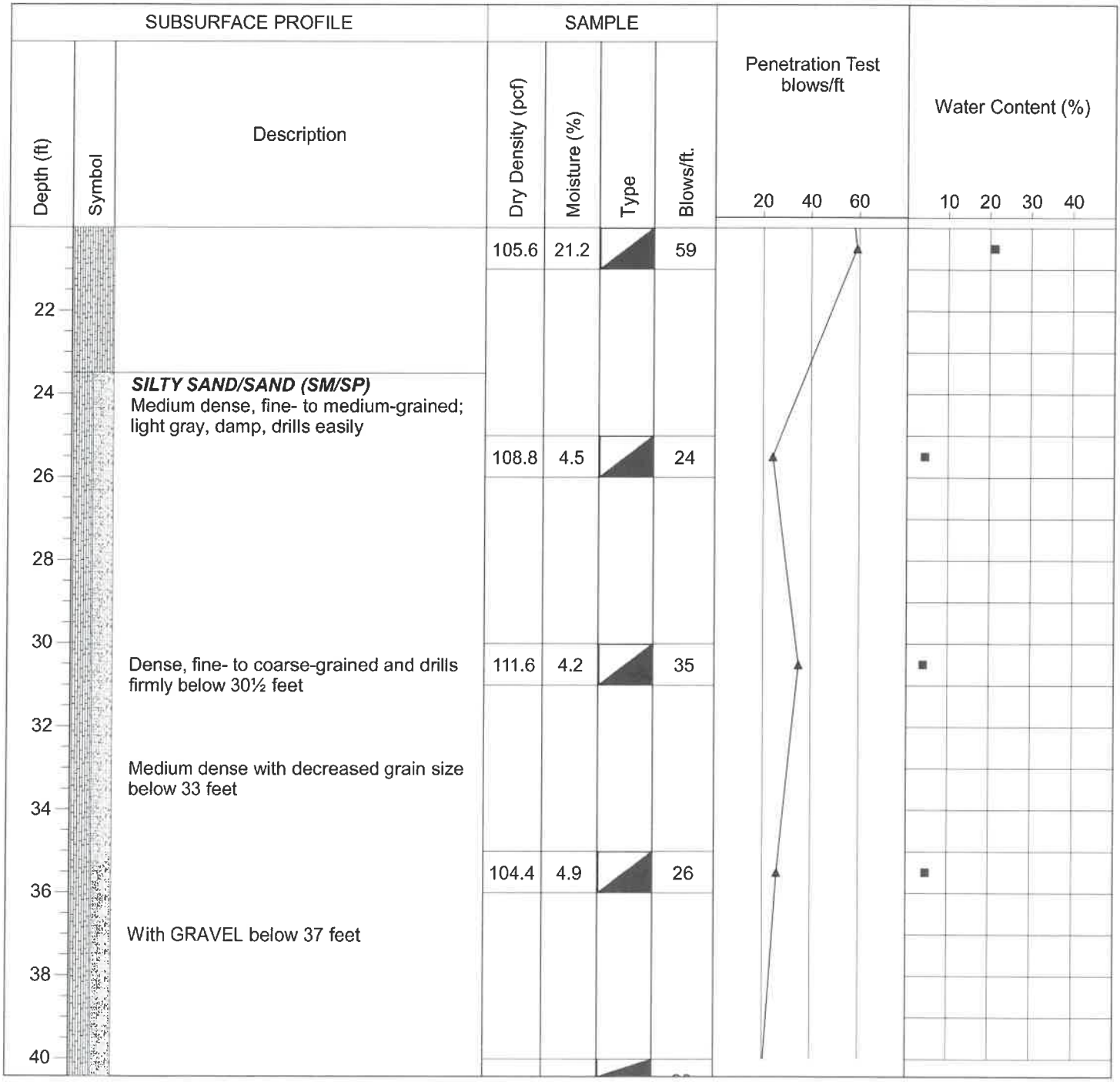
Log of Boring B2

Project: Hope ES - New Multi-Use Gym Building | **Project No:** 012-23205

Client: Hope Elementary School District | **Figure No.:** A-2

Location: 613 W. Teapot Dome Avenue, Porterville, California | **Logged By:** Wayne Andrade

Depth to Water> | **Initial:** None | **At Completion:** None



Drill Method: Hollow Stem | **Drill Date:** 10-17-23

Drill Rig: CME B80 | **Krazan and Associates** | **Hole Size:** 6½ Inches

Driller: David Lopez | **Elevation:** 50 Feet

Log of Boring B2

Project: Hope ES - New Multi-Use Gym Building

Project No: 012-23205

Client: Hope Elementary School District

Figure No.: A-2

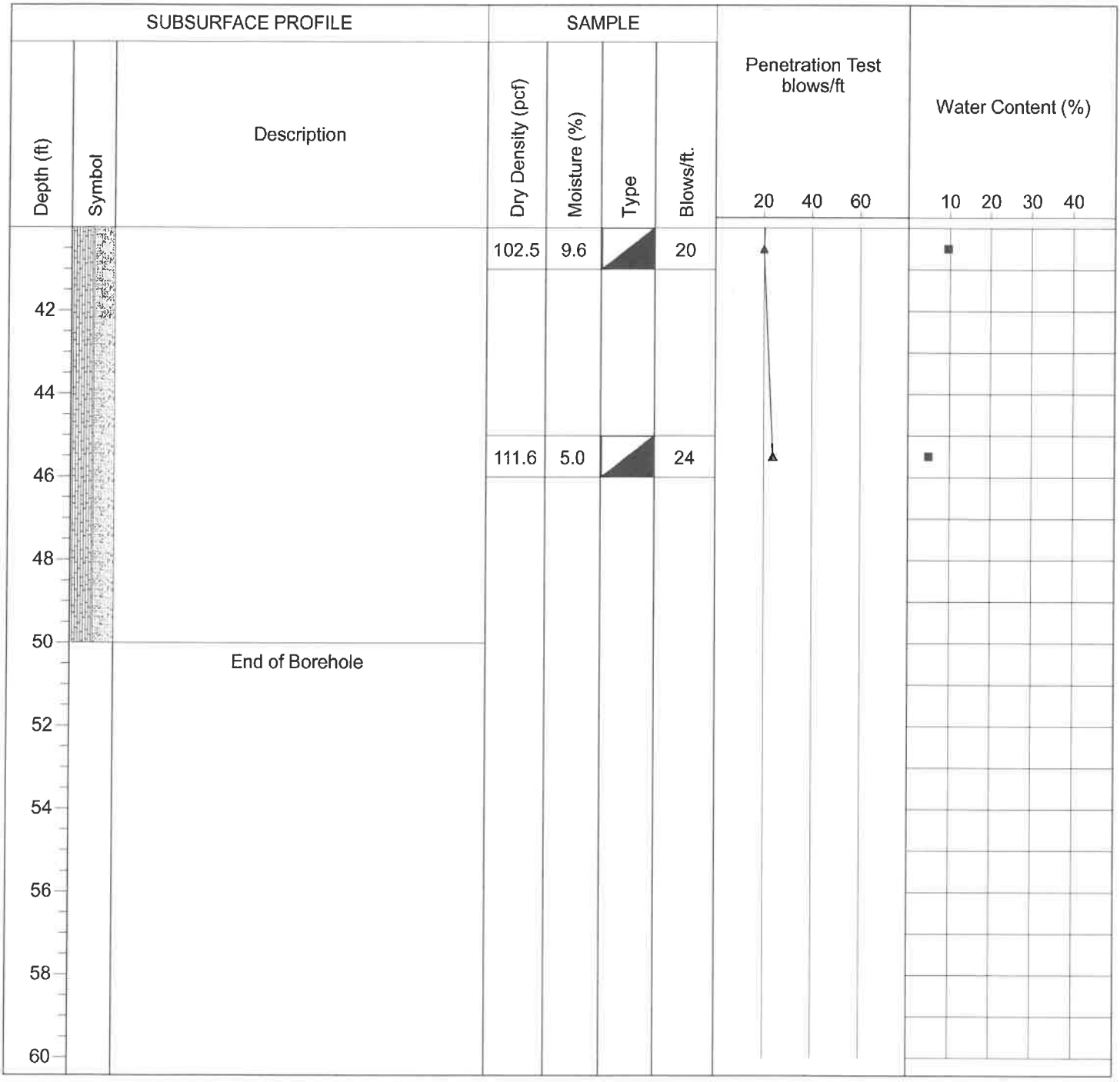
Location: 613 W. Teapot Dome Avenue, Porterville, California

Logged By: Wayne Andrade

Depth to Water>

Initial: None

At Completion: None



Drill Method: Hollow Stem

Drill Date: 10-17-23

Drill Rig: CME B80

Krazan and Associates

Hole Size: 6½ Inches

Driller: David Lopez

Elevation: 50 Feet

Log of Boring B3

Project: Hope ES - New Multi-Use Gym Building

Project No: 012-23205

Client: Hope Elementary School District

Figure No.: A-3

Location: 613 W. Teapot Dome Avenue, Porterville, California

Logged By: Wayne Andrade

Depth to Water>

Initial: None

At Completion: None

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture (%)	Type	Blows/ft.
0		Ground Surface				
		SILTY SAND (SM) FILL, fine- to coarse-grained; light brown, damp, drills easily				9
2		***SILTY SAND (SM)*** Loose, fine- to medium-grained with CLAY; brown, damp, drills easily Very dense and drills hard below 2½ feet	112.7	8.5		68
4		***SANDY SILT (ML)*** Very dense, fine-grained with CLAY, weakly cemented; brown, damp, drills hard	110.0	10.9		43
6		***SANDY SILT (ML)*** Dense, fine-grained with CLAY; brown, damp, drills firmly				
8		Medium dense and red-brown below 9 feet				
10			116.1	12.1		27
12						
14		Dense and brown below 15 feet				
16			117.3	13.7		41
18						
20						

Penetration Test blows/ft: 20, 40, 60

Water Content (%): 10, 20, 30, 40

Drill Method: Hollow Stem

Drill Rig: CME B80

Driller: David Lopez

Krazan and Associates

Drill Date: 10-17-23

Hole Size: 6½ Inches

Elevation: 20 Feet

PROJECT: Soils Investigation
Hope Elementary School
613 W. Teapot Dome Ave
Porterville

PROJECT NO: 052-23043
DATE RECEIVED: 10/18/2023
REPORT DATE: 11/1/2023

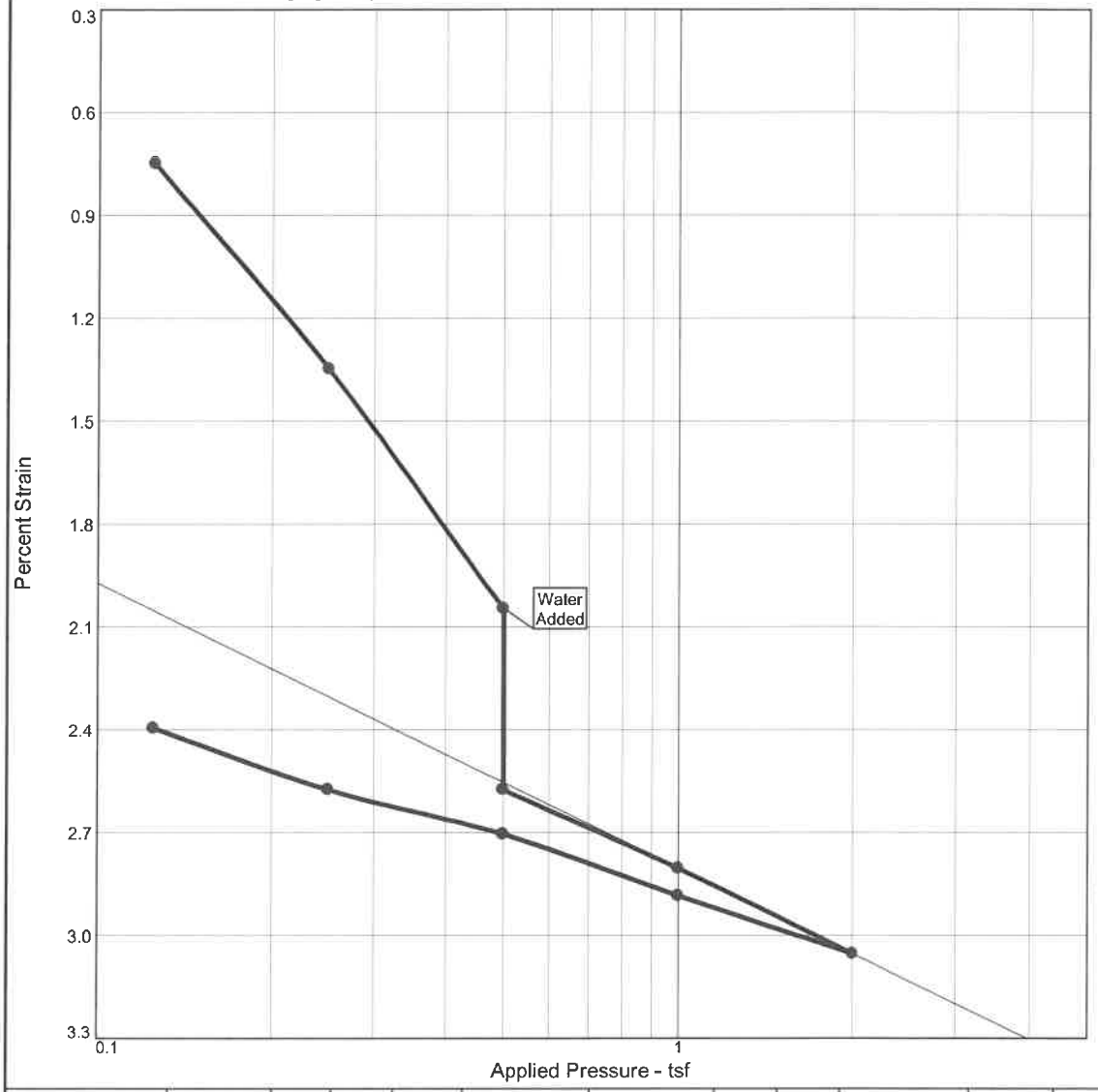
TABLE 1
IN-SITU
MOISTURE DENSITY RELATIONSHIP

LOCATION	DEPTH BELOW EXISTING GRADE	MOISTURE CONTENT % OF DRY WT.	IN-PLACE DENSITY (DRY) LBS/CU.FT
B1	1 – 1.5'	8.2	104.5
B1	3 – 3.5'	7.1	106.7
B1	6 – 6.5'	20.8	102.4
B1	10 – 11'	11.0	N/A
B1	15 – 16'	12.3	N/A
B1	20 – 21'	15.8	N/A
B1 (Bulk)	0 – 2'	7.9	N/A
B2	1.5 – 2.5'	6.3	111.1
B2	5 – 6'	11.2	123.9
B2	10 – 11'	14.2	111.1
B2	15 – 16'	11.4	109.5
B2	20 – 21'	21.2	105.6
B2	25 – 26'	4.5	108.8
B2	30 – 31'	4.2	111.6
B2	35 – 36'	4.9	104.4
B2	40 – 41'	9.6	102.5
B2	45 – 46'	5.0	111.6
B2 (Bulk)	0 – 2'	11.3	N/A
B3	2 – 3'	8.5	112.7
B3	5 – 6'	10.9	110.0
B3	10 – 11'	12.1	116.1
B3	15 – 16'	13.7	117.3
B3 (Bulk)	2 – 4'	6.8	N/A

***Note:** Samples with "N/A" under the far right column were contained in a bag & therefore could not have their in-situ densities determined.*

CTL-Krazan

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_s	Swell Press. (tsf)	Clpse. %	e_o
79.7 %	20.8 %	96.7			2.6		1.0	0.01	0.01		0.5	0.678

MATERIAL DESCRIPTION	USCS	AASHTO
In situ, undisturbed		

Project No. 052-23043 **Client:** Hope Elementary School District

Project: Hope Elementary School

Location: B1 **Depth:** 6 - 6.5' **Sample Number:** B1

CTL, Inc.

Exeter, California

Remarks:

Figure B1

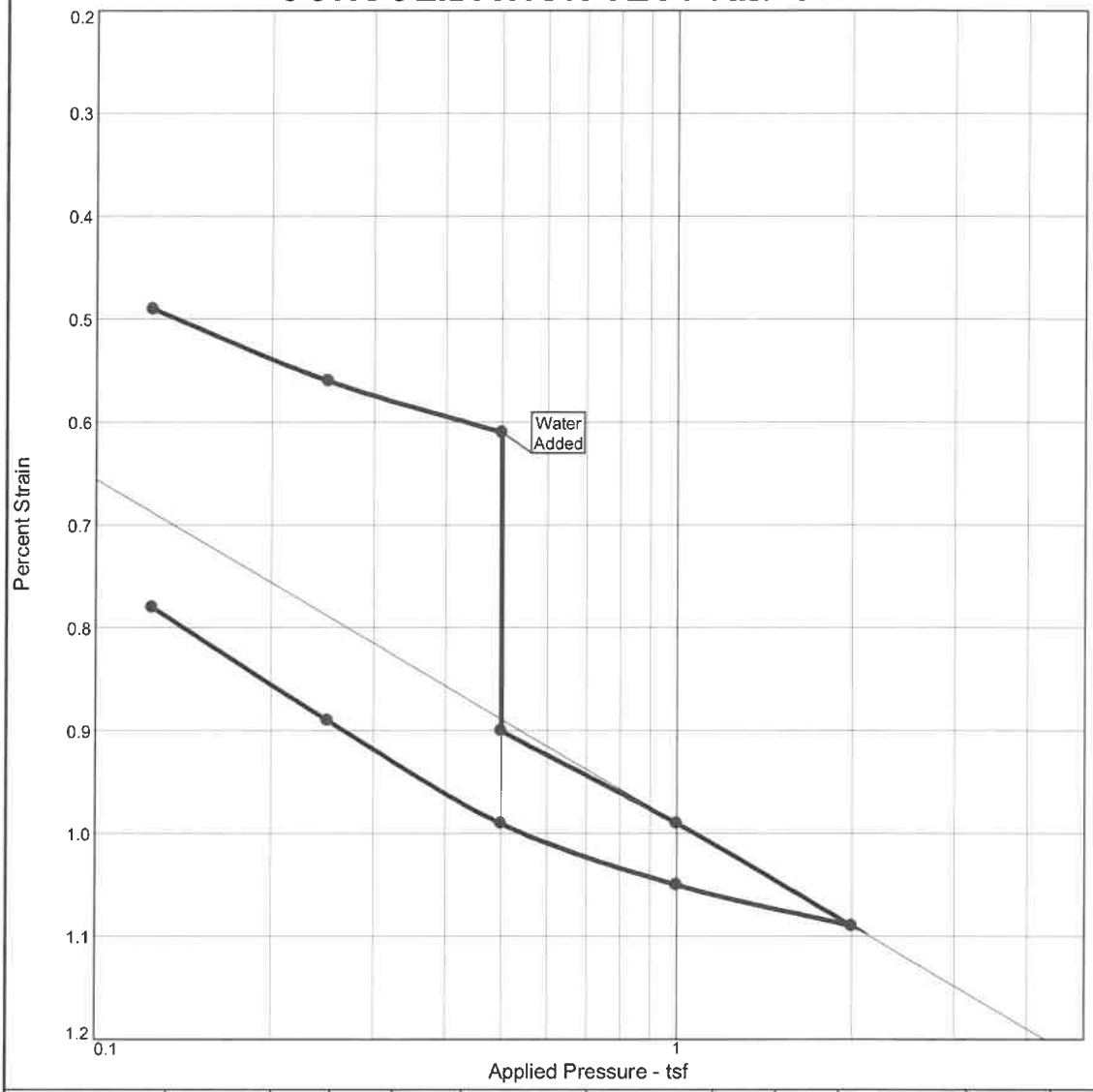
Tested By: GS **Checked By:** DJ

Per CTL-Krazan Policy, samples will be disposed 1 month after their respective testing is completed, unless otherwise directed by the client.

CTL-Krazan

CTL-Krazan

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (tsf)	P_c (tsf)	C_c	C_s	Swell Press. (tsf)	Clpse. %	e_o
20.3 %	6.3 %	90.0			2.6		1.0	0.01	0.00		0.3	0.804

MATERIAL DESCRIPTION	USCS	AASHTO
In situ, undisturbed		

Project No. 052-23043 **Client:** Hope Elementary School District

Project: Hope Elementary School

Location: B2 **Depth:** 1.5 - 2.5' **Sample Number:** B2

Remarks:

CTL, Inc.

Exeter, California

Figure B2

Tested By: GS **Checked By:** DJ

Per CTL-Krazan Policy, samples will be disposed 1 month after their respective testing is completed, unless otherwise directed by the client.

CTL-Krazan

PROJECT: Soils Investigation
Hope Elementary School
613 W. Teapot Dome Ave
Porterville

PROJECT NO: 052-23043
DATE RECEIVED: 10/18/2023
REPORT DATE: 11/1/2023

TABLE 4

DIRECT SHEAR TESTS

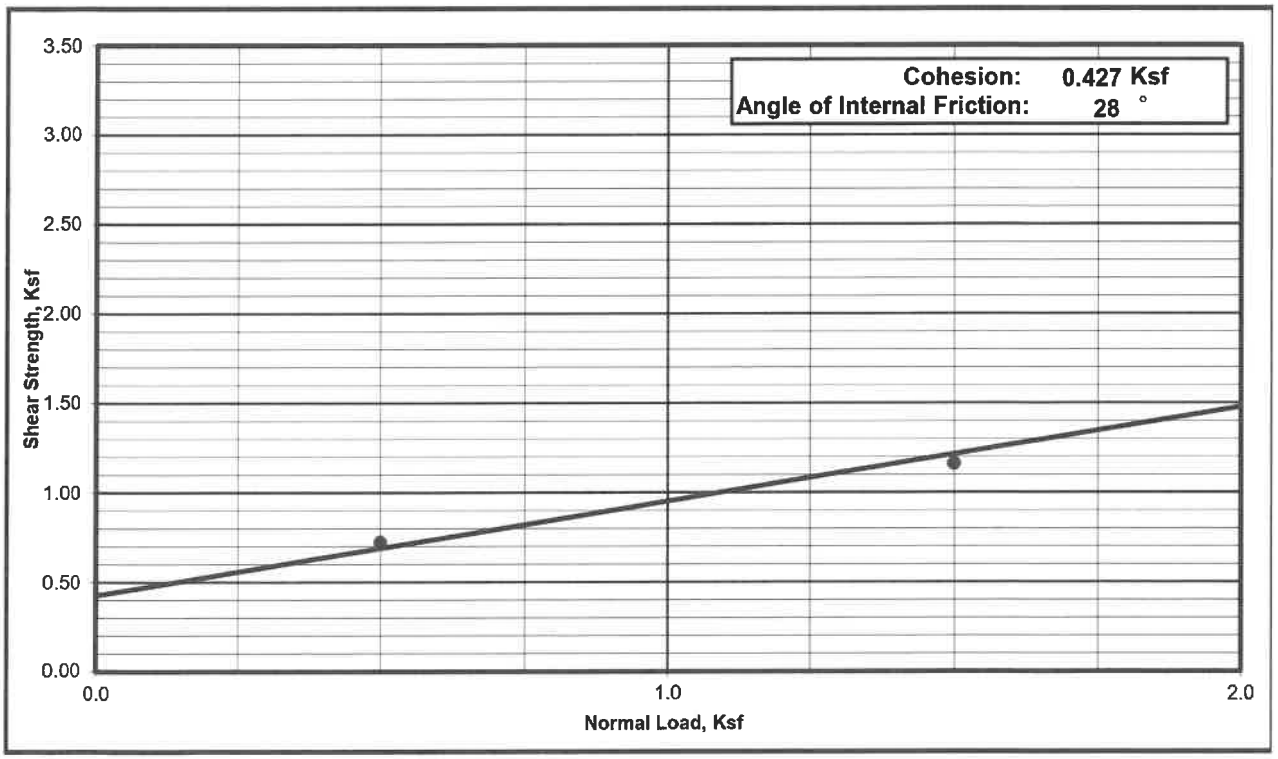
(UNDISTURBED SAMPLES)

SAMPLE LOCATION	DEPTH	% MOISTURE BEFORE TEST	% MOISTURE AFTER TEST	COHESION LBS/SQ.FT.	INTERNAL FRICTION
B1	1 – 1.5'	8.2	18.2	427	28°
B3	5 – 6'	10.9	19.8	389	41°

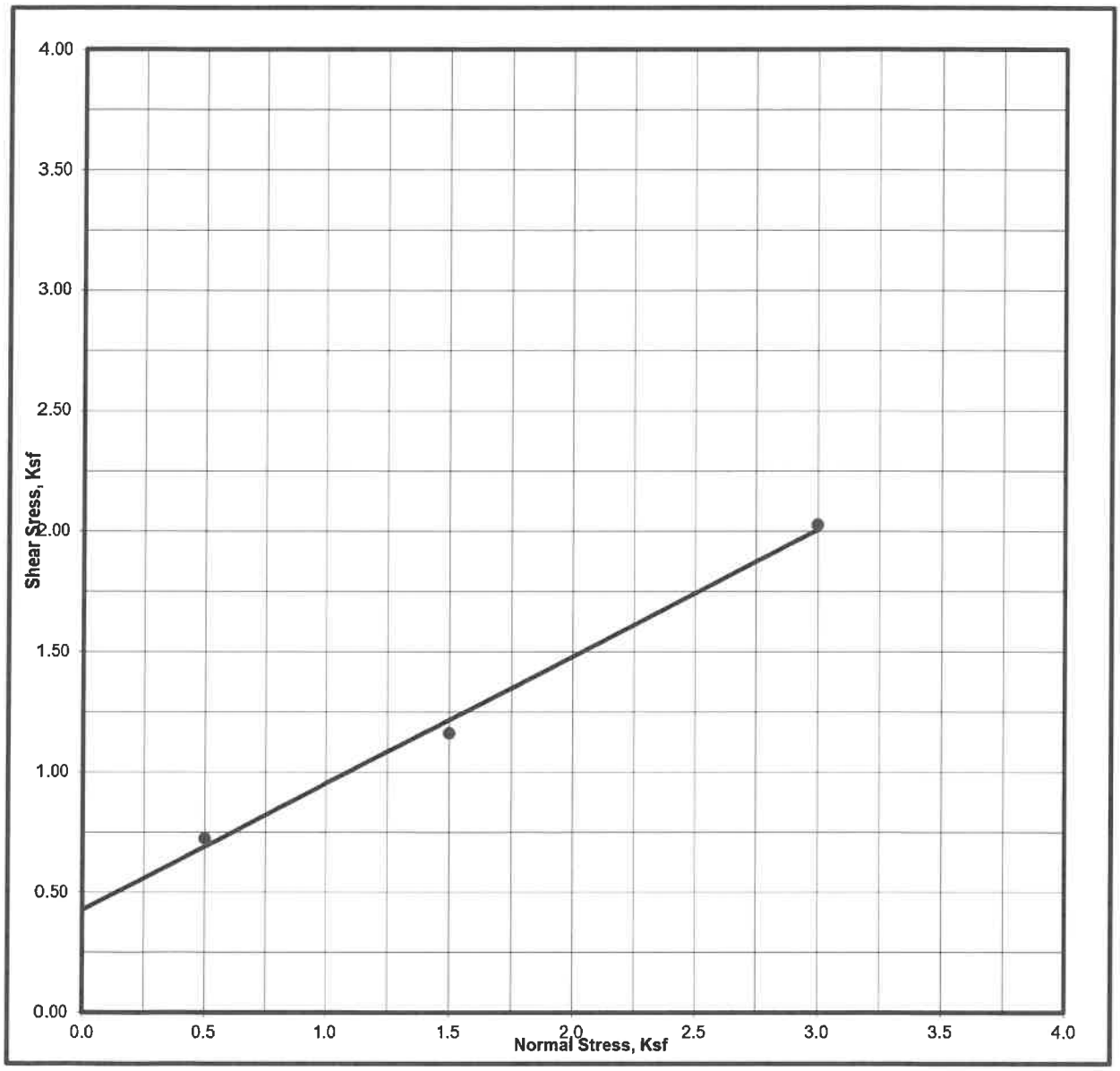
Direct Shear

Project Number	: 052-23043
Project Name	: Hope School
Date	: 11/1/2023
Sample Location	: B1 @ 1 - 1.5'
Soil Classification	:
Sample Surface Area	: 0.03168

Normal Load psf	Shear force lbs	Shear Stress psf
500	22.9	723
1500	36.8	1161
3000	64.2	2027



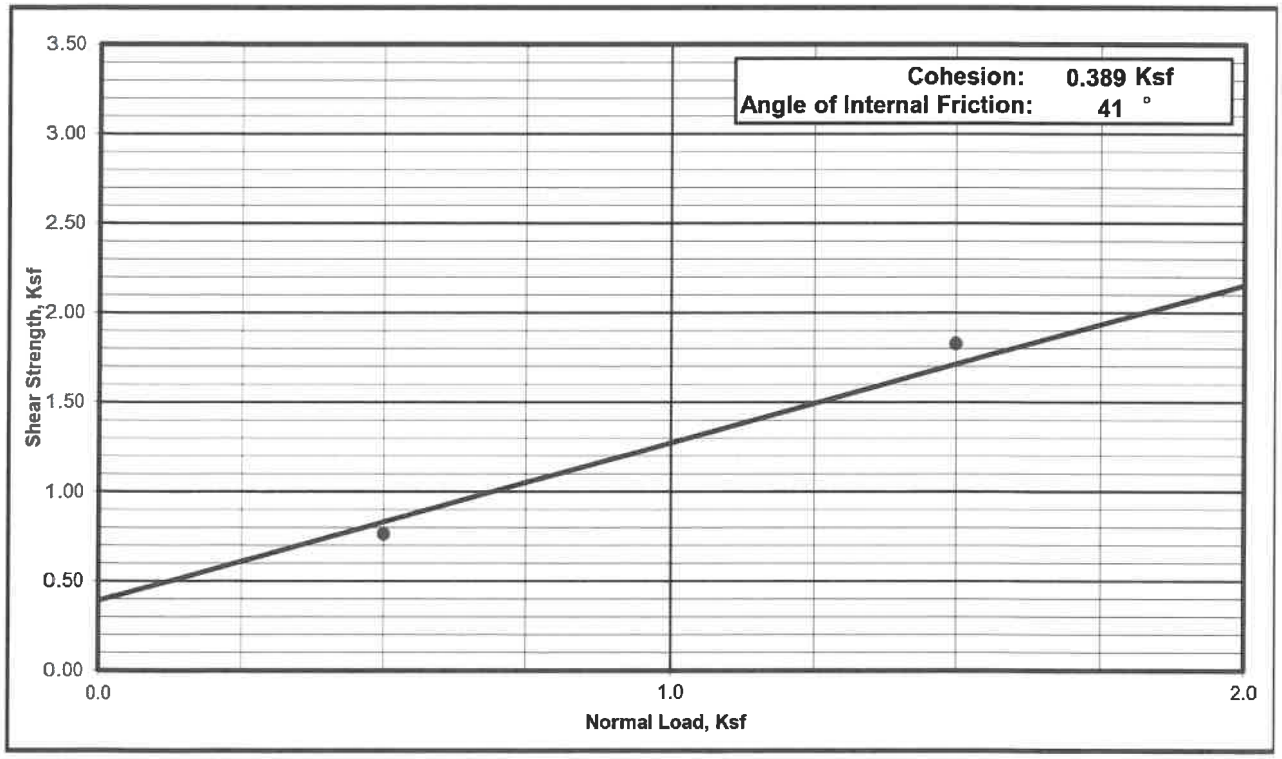
Cohesion:	0.427 Ksf
Friction Angle:	28 °



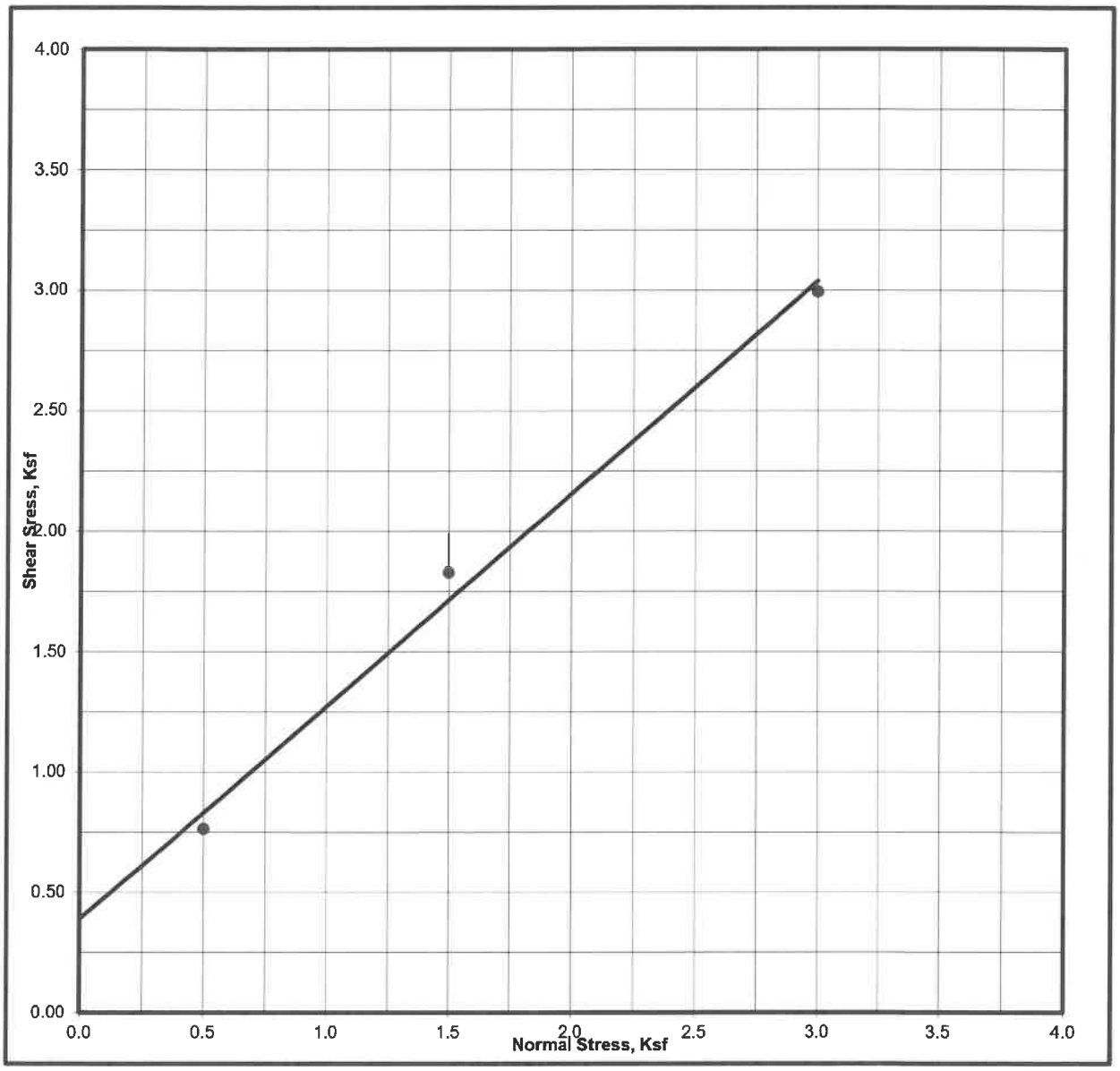
Direct Shear

Project Number	: 052-23043
Project Name	: Hope School
Date	: 11/1/2023
Sample Location	: B3 @ 5 - 6'
Soil Classification	:
Sample Surface Area	: 0.03168

Normal Load psf	Shear force lbs	Shear Stress psf
500	24.2	763
1500	57.9	1828
3000	94.8	2993



Cohesion:	0.389 Ksf
Friction Angle:	41 °



PROJECT: Soils Investigation
Hope Elementary School
613 W. Teapot Dome Ave
Porterville

PROJECT NO: 052-23043
DATE RECEIVED: 10/18/2023
REPORT DATE: 11/1/2023

TABLE 2

MECHANICAL SIEVE ANALYSIS

ASTM C136 // D1140

% Passing U.S. Standard Sieve Sizes

Location	Depth	No.4	No.8	No.16	No.30	No.50	No.100	No.200	Group symbol
B1	6 – 6.5'	97.8	96.4	94.9	89.1	83.5	76.6	61.3	CL
B2	1.5 – 2.5'	98.4	97.3	93.0	85.3	74.8	61.7	51.3	SM/ML
B2	10 – 11'	-	-	-	-	-	-	50.9	SM/ML
B2	15 – 16'	-	-	-	-	-	-	30.7	SM
B2	20 – 21'	-	-	-	-	-	-	42.8	SM
B2	25 – 26'	-	-	-	-	-	-	8.7	SP-SM
B2	30 – 31'	-	-	-	-	-	-	8.5	SP-SM
B2	35 – 36'	-	-	-	-	-	-	6.8	SP-SM
B2	40 – 41'	-	-	-	-	-	-	11.2	SP-SM
B2	45 – 46'	-	-	-	-	-	-	7.8	SP-SM

PROJECT: Soils Investigation
Hope Elementary School
613 W. Teapot Dome Ave
Porterville

PROJECT NO: 052-23043
DATE RECEIVED: 10/18/2023
REPORT DATE: 11/1/2023

TABLE 3

EXPANSION INDEX TEST RESULTS

ASTM D4829 - 11

U.B.C. STANDARD NO. 18-2

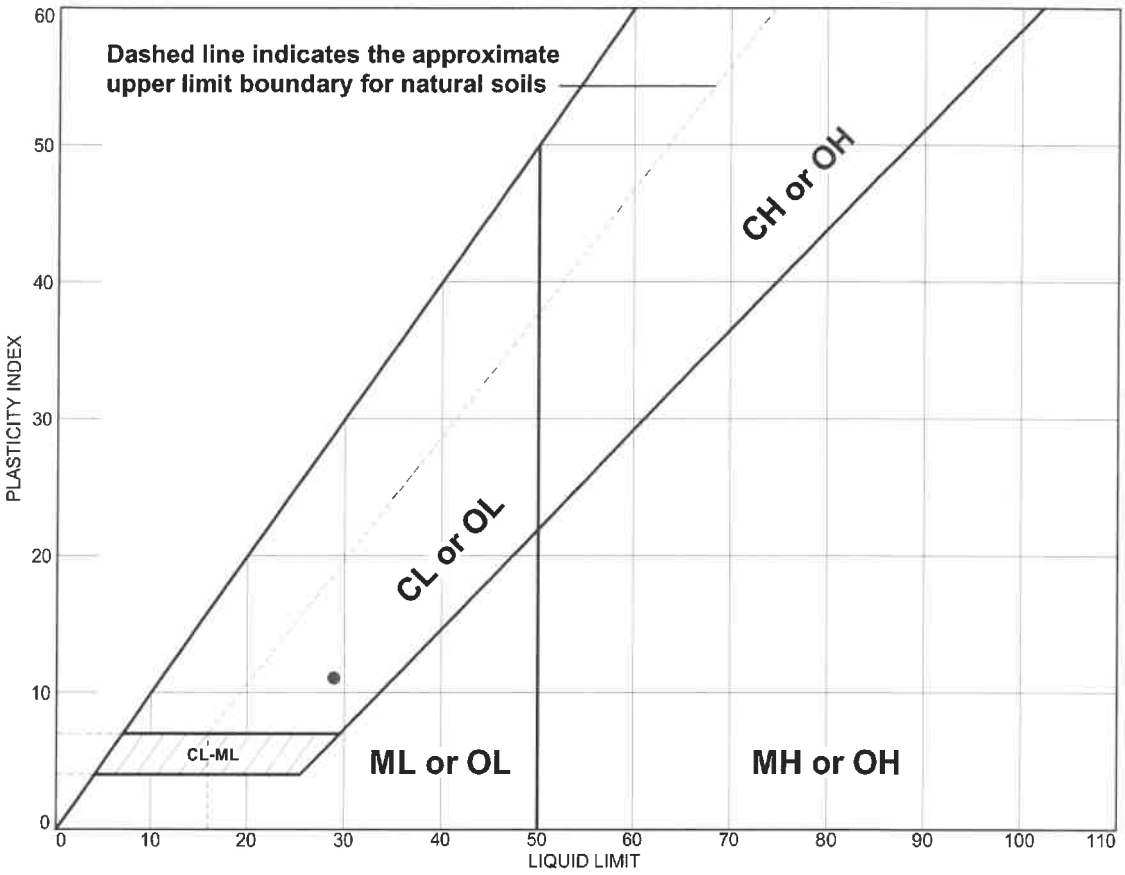
LOCATION	DEPTH B.E.G	TOTAL LOAD	% EXPANSION	%MOISTURE BEFORE TEST	%MOISTURE AFTER TEST	CHANGE IN MOISTURE	EXPANSION IN% PER% EXPANSION INDEX	POTENTIAL CLASSIFICATION
B1 (Bulk)	0 – 2'	144 PSF	2.40	9.6	17.5	7.9	24	Low
B2 (Bulk)	0 – 2'	144 PSF	1.46	7.9	22.1	14.2	15	Very Low

CLASSIFICATION OF EXPANSIVE SOILS

EXPANSION	POTENTIAL EXPANSION
1-20	VERY LOW
21-50	LOW
51-90	MEDIUM
91-130	HIGH
ABOVE 130	VERY HIGH

CTL-Krazan

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●		29	18	11			
■		NV	16	NP			

Project No. 052-23043 **Client:** Hope Elementary School District

Project: Hope Elementary School

● **Location:** B1 (Bulk) **Depth:** 0 - 2' **Sample Number:** B1

■ **Location:** B3 (Bulk) **Depth:** 2 - 4' **Sample Number:** B3

Remarks:

CTL, Inc.

Exeter, California

Figure

Tested By: GS **Checked By:** DJ/DH

Per CTL-Krazan Policy, samples will be disposed 1 month after their respective testing is completed, unless otherwise directed by the client.

CTL-Krazan

APPENDIX B

EARTHWORK SPECIFICATIONS

GENERAL

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including but not limited to the furnishing of all labor, tools, and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans, and disposal of excess materials.

PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of Krazan and Associates, Inc., hereinafter known as the Soils Engineer and/or Testing Agency. Attainment of design grades when achieved shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary readjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

TECHNICAL REQUIREMENTS: All compacted materials shall be densified to a density not less than 90 percent relative compaction based on ASTM Test Method D1557 or CAL-216, as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be as determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the soil report.

The Contractor shall make his own interpretation of the data contained in said report, and the Contractor shall not be relieved of liability under the Contract documents for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or windblown materials attributable to his work.

SITE PREPARATION

Site preparation shall consist of site clearing and grubbing and the preparations of foundation materials for receiving fill.

CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter, and all other matter determined by the Soils Engineer to be deleterious or otherwise unsuitable. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed building areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots larger than 1 inch. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations should not be permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

SUBGRADE PREPARATION: Surfaces to receive Engineered Fill, building or slab loads shall be prepared as outlined above, excavated/scarified to a depth of 12 inches, moisture-conditioned as necessary, and compacted to 90 percent relative compaction.

Loose soil areas, areas of uncertified fill, and/or areas of disturbed soils shall be moisture-conditioned as necessary and recompacted to 90 percent relative compaction. All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any of the fill material.

EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. However, compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer.

Both cut and fill areas shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill are as specified.

APPENDIX C

PAVEMENT SPECIFICATIONS

1. DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term "Standard Specifications": hereinafter referred to is the 2018 Standard Specifications of the State of California, Department of Transportation, and the "Materials Manual" is the Materials Manual of Testing and Control Procedures, State of California, Department of Public Works, Division of Highways. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as defined in the applicable tests outlined in the Materials Manual.

2. SCOPE OF WORK - This portion of the work shall include all labor, materials, tools, and equipment necessary for, and reasonably incidental to the completion of the pavement shown on the plans and as herein specified, except work specifically noted as "Work Not Included."

3. PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 90 percent. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

4. UNTREATED AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class 2 material, 1½ inches maximum size. The aggregate base material shall be spread and compacted in accordance with Section 26 of the Standard Specifications. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent.

5. AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class 2 material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent, and it shall be spread and compacted in accordance with Section 25 of the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

6. ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10. The mineral aggregate shall be Type B, ½ inch maximum size, medium grading and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning and mixing of the materials shall conform to Section 39.

The prime coat, spreading and compacting equipment and spreading and compacting mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50° F. The surfacing shall be rolled with a combination of steel wheel and pneumatic rollers, as described in Section 39-6. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

7. FOG SEAL COAT - The fog seal (mixing type asphaltic emulsion) shall conform to and be applied in accordance with the requirements of Section 37.

APPENDIX D

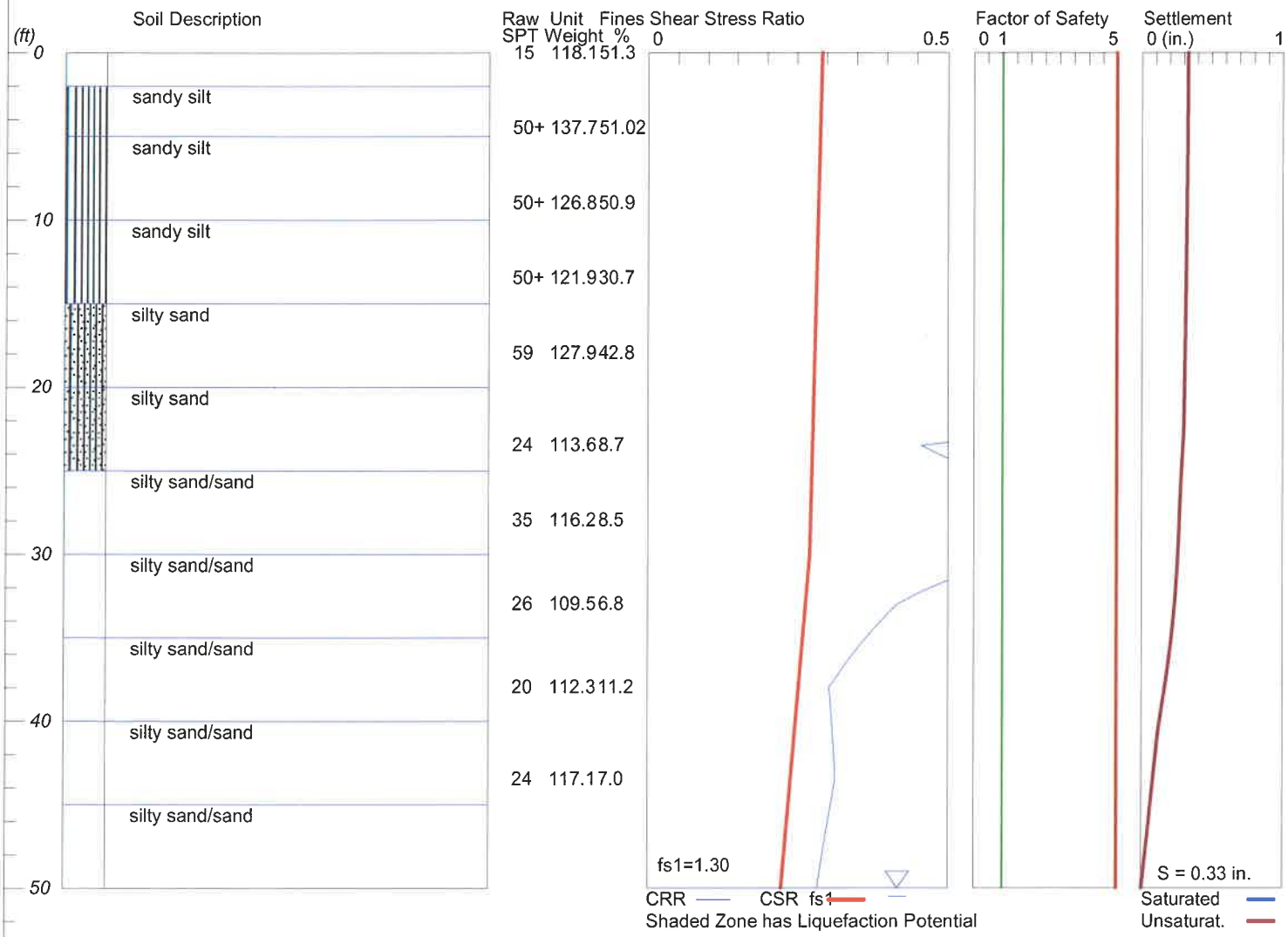
LIQUEFACTION ANALYSIS

LIQUEFACTION ANALYSIS

Hope Elementary School

Hole No.=B-2 Water Depth=50 ft

Magnitude=6.22
Acceleration=0.345g



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LIQUEFACTION ANALYSIS SUMMARY
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Licensed to , Krazan and Associates 11/14/2023 12:41:55 PM
Input File Name: H:\Liquefy5\Hope El. Schl..liq
Title: Hope Elementary School
Subtitle: New Multi-use Gymnasium
Surface Elev.=
Hole No.=B-2
Depth of Hole= 50.00 ft
Water Table during Earthquake= 50.00 ft
Water Table during In-Situ Testing= 50.00 ft
Max. Acceleration= 0.34 g
Earthquake Magnitude= 6.22
Input Data:
Surface Elev.=
Hole No.=B-2
Depth of Hole=50.00 ft
Water Table during Earthquake= 50.00 ft
Water Table during In-Situ Testing= 50.00 ft
Max. Acceleration=0.34 g
Earthquake Magnitude=6.22
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. SPT or BPT Calculation.
2. Settlement Analysis Method: Tokimatsu/Seed
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1.3
Plot one CSR curve (fs1=User)
10. Use Curve Smoothing: Yes*
* Recommended Options
In-Situ Test Data:

Depth ft	SPT	gamma pcf	Fines %
0.00	15.00	118.10	51.30
4.50	50.00	137.70	51.02
9.00	50.00	126.80	50.90
13.50	50.00	121.90	30.70
18.00	59.00	127.90	42.80
23.50	24.00	113.60	8.70
28.00	35.00	116.20	8.50
33.00	26.00	109.50	6.80
38.00	20.00	112.30	11.20
43.50	24.00	117.10	7.00
50.00	24.00	117.10	7.00

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.33 in.
Total Settlement of Saturated and Unsaturated Sands=0.33 in.
Differential Settlement=0.164 to 0.217 in.

Depth ft	CRRm	CSRfs	F.S.	S_sat. in.	S_dry in.	S_all in.
0.00	3.23	0.29	5.00	0.00	0.33	0.33
0.05	3.23	0.29	5.00	0.00	0.33	0.33
0.10	3.23	0.29	5.00	0.00	0.33	0.33
0.15	3.23	0.29	5.00	0.00	0.33	0.33
0.20	3.23	0.29	5.00	0.00	0.33	0.33
0.25	3.23	0.29	5.00	0.00	0.33	0.33
0.30	3.23	0.29	5.00	0.00	0.33	0.33
0.35	3.23	0.29	5.00	0.00	0.33	0.33
0.40	3.23	0.29	5.00	0.00	0.33	0.33
0.45	3.23	0.29	5.00	0.00	0.33	0.33
0.50	3.23	0.29	5.00	0.00	0.33	0.33
0.55	3.23	0.29	5.00	0.00	0.33	0.33
0.60	3.23	0.29	5.00	0.00	0.33	0.33
0.65	3.23	0.29	5.00	0.00	0.33	0.33
0.70	3.23	0.29	5.00	0.00	0.33	0.33
0.75	3.23	0.29	5.00	0.00	0.33	0.33
0.80	3.23	0.29	5.00	0.00	0.33	0.33
0.85	3.23	0.29	5.00	0.00	0.33	0.33
0.90	3.23	0.29	5.00	0.00	0.33	0.33
0.95	3.23	0.29	5.00	0.00	0.33	0.33
1.00	3.23	0.29	5.00	0.00	0.33	0.33
1.05	3.23	0.29	5.00	0.00	0.33	0.33
1.10	3.23	0.29	5.00	0.00	0.33	0.33
1.15	3.23	0.29	5.00	0.00	0.33	0.33
1.20	3.23	0.29	5.00	0.00	0.33	0.33
1.25	3.23	0.29	5.00	0.00	0.33	0.33
1.30	3.23	0.29	5.00	0.00	0.33	0.33
1.35	3.23	0.29	5.00	0.00	0.33	0.33
1.40	3.23	0.29	5.00	0.00	0.33	0.33
1.45	3.23	0.29	5.00	0.00	0.33	0.33
1.50	3.23	0.29	5.00	0.00	0.33	0.33
1.55	3.23	0.29	5.00	0.00	0.33	0.33
1.60	3.23	0.29	5.00	0.00	0.33	0.33
1.65	3.23	0.29	5.00	0.00	0.33	0.33
1.70	3.23	0.29	5.00	0.00	0.33	0.33
1.75	3.23	0.29	5.00	0.00	0.33	0.33
1.80	3.23	0.29	5.00	0.00	0.33	0.33
1.85	3.23	0.29	5.00	0.00	0.33	0.33
1.90	3.23	0.29	5.00	0.00	0.33	0.33
1.95	3.23	0.29	5.00	0.00	0.33	0.33
2.00	3.23	0.29	5.00	0.00	0.33	0.33
2.05	3.23	0.29	5.00	0.00	0.33	0.33
2.10	3.23	0.29	5.00	0.00	0.33	0.33
2.15	3.23	0.29	5.00	0.00	0.33	0.33
2.20	3.23	0.29	5.00	0.00	0.33	0.33
2.25	3.23	0.29	5.00	0.00	0.33	0.33
2.30	3.23	0.29	5.00	0.00	0.33	0.33
2.35	3.23	0.29	5.00	0.00	0.33	0.33
2.40	3.23	0.29	5.00	0.00	0.33	0.33
2.45	3.23	0.29	5.00	0.00	0.33	0.33
2.50	3.23	0.29	5.00	0.00	0.33	0.33
2.55	3.23	0.29	5.00	0.00	0.33	0.33
2.60	3.23	0.29	5.00	0.00	0.33	0.33
2.65	3.23	0.29	5.00	0.00	0.33	0.33
2.70	3.23	0.29	5.00	0.00	0.33	0.33

2.75	3.23	0.29	5.00	0.00	0.33	0.33
2.80	3.23	0.29	5.00	0.00	0.33	0.33
2.85	3.23	0.29	5.00	0.00	0.33	0.33
2.90	3.23	0.29	5.00	0.00	0.33	0.33
2.95	3.23	0.29	5.00	0.00	0.33	0.33
3.00	3.23	0.29	5.00	0.00	0.33	0.33
3.05	3.23	0.29	5.00	0.00	0.33	0.33
3.10	3.23	0.29	5.00	0.00	0.33	0.33
3.15	3.23	0.29	5.00	0.00	0.33	0.33
3.20	3.23	0.29	5.00	0.00	0.33	0.33
3.25	3.23	0.29	5.00	0.00	0.33	0.33
3.30	3.23	0.29	5.00	0.00	0.33	0.33
3.35	3.23	0.29	5.00	0.00	0.33	0.33
3.40	3.23	0.29	5.00	0.00	0.33	0.33
3.45	3.23	0.29	5.00	0.00	0.33	0.33
3.50	3.23	0.29	5.00	0.00	0.33	0.33
3.55	3.23	0.29	5.00	0.00	0.33	0.33
3.60	3.23	0.29	5.00	0.00	0.33	0.33
3.65	3.23	0.29	5.00	0.00	0.33	0.33
3.70	3.23	0.29	5.00	0.00	0.33	0.33
3.75	3.23	0.29	5.00	0.00	0.33	0.33
3.80	3.23	0.29	5.00	0.00	0.33	0.33
3.85	3.23	0.29	5.00	0.00	0.33	0.33
3.90	3.23	0.29	5.00	0.00	0.33	0.33
3.95	3.23	0.29	5.00	0.00	0.33	0.33
4.00	3.23	0.29	5.00	0.00	0.33	0.33
4.05	3.23	0.29	5.00	0.00	0.33	0.33
4.10	3.23	0.29	5.00	0.00	0.33	0.33
4.15	3.23	0.29	5.00	0.00	0.33	0.33
4.20	3.23	0.29	5.00	0.00	0.33	0.33
4.25	3.23	0.29	5.00	0.00	0.33	0.33
4.30	3.23	0.29	5.00	0.00	0.33	0.33
4.35	3.23	0.29	5.00	0.00	0.33	0.33
4.40	3.23	0.29	5.00	0.00	0.33	0.33
4.45	3.23	0.29	5.00	0.00	0.33	0.33
4.50	3.23	0.29	5.00	0.00	0.33	0.33
4.55	3.23	0.29	5.00	0.00	0.33	0.33
4.60	3.23	0.29	5.00	0.00	0.33	0.33
4.65	3.23	0.29	5.00	0.00	0.33	0.33
4.70	3.23	0.29	5.00	0.00	0.33	0.33
4.75	3.23	0.29	5.00	0.00	0.33	0.33
4.80	3.23	0.29	5.00	0.00	0.33	0.33
4.85	3.23	0.29	5.00	0.00	0.33	0.33
4.90	3.23	0.29	5.00	0.00	0.33	0.33
4.95	3.23	0.29	5.00	0.00	0.33	0.33
5.00	3.23	0.29	5.00	0.00	0.33	0.33
5.05	3.23	0.29	5.00	0.00	0.33	0.33
5.10	3.23	0.29	5.00	0.00	0.33	0.33
5.15	3.23	0.29	5.00	0.00	0.33	0.33
5.20	3.23	0.29	5.00	0.00	0.33	0.33
5.25	3.23	0.29	5.00	0.00	0.33	0.33
5.30	3.23	0.29	5.00	0.00	0.33	0.33
5.35	3.23	0.29	5.00	0.00	0.33	0.33
5.40	3.23	0.29	5.00	0.00	0.33	0.33
5.45	3.23	0.29	5.00	0.00	0.33	0.33
5.50	3.23	0.29	5.00	0.00	0.33	0.33
5.55	3.23	0.29	5.00	0.00	0.33	0.33
5.60	3.23	0.29	5.00	0.00	0.33	0.33

5.65	3.23	0.29	5.00	0.00	0.33	0.33
5.70	3.23	0.29	5.00	0.00	0.33	0.33
5.75	3.23	0.29	5.00	0.00	0.33	0.33
5.80	3.23	0.29	5.00	0.00	0.32	0.32
5.85	3.23	0.29	5.00	0.00	0.32	0.32
5.90	3.23	0.29	5.00	0.00	0.32	0.32
5.95	3.23	0.29	5.00	0.00	0.32	0.32
6.00	3.23	0.29	5.00	0.00	0.32	0.32
6.05	3.23	0.29	5.00	0.00	0.32	0.32
6.10	3.23	0.29	5.00	0.00	0.32	0.32
6.15	3.23	0.29	5.00	0.00	0.32	0.32
6.20	3.23	0.29	5.00	0.00	0.32	0.32
6.25	3.23	0.29	5.00	0.00	0.32	0.32
6.30	3.23	0.29	5.00	0.00	0.32	0.32
6.35	3.23	0.29	5.00	0.00	0.32	0.32
6.40	3.23	0.29	5.00	0.00	0.32	0.32
6.45	3.23	0.29	5.00	0.00	0.32	0.32
6.50	3.23	0.29	5.00	0.00	0.32	0.32
6.55	3.23	0.29	5.00	0.00	0.32	0.32
6.60	3.23	0.29	5.00	0.00	0.32	0.32
6.65	3.23	0.29	5.00	0.00	0.32	0.32
6.70	3.23	0.29	5.00	0.00	0.32	0.32
6.75	3.23	0.29	5.00	0.00	0.32	0.32
6.80	3.23	0.29	5.00	0.00	0.32	0.32
6.85	3.23	0.29	5.00	0.00	0.32	0.32
6.90	3.23	0.29	5.00	0.00	0.32	0.32
6.95	3.23	0.29	5.00	0.00	0.32	0.32
7.00	3.23	0.29	5.00	0.00	0.32	0.32
7.05	3.23	0.29	5.00	0.00	0.32	0.32
7.10	3.23	0.29	5.00	0.00	0.32	0.32
7.15	3.23	0.29	5.00	0.00	0.32	0.32
7.20	3.23	0.29	5.00	0.00	0.32	0.32
7.25	3.23	0.29	5.00	0.00	0.32	0.32
7.30	3.23	0.29	5.00	0.00	0.32	0.32
7.35	3.23	0.29	5.00	0.00	0.32	0.32
7.40	3.23	0.29	5.00	0.00	0.32	0.32
7.45	3.23	0.29	5.00	0.00	0.32	0.32
7.50	3.23	0.29	5.00	0.00	0.32	0.32
7.55	3.23	0.29	5.00	0.00	0.32	0.32
7.60	3.23	0.29	5.00	0.00	0.32	0.32
7.65	3.23	0.29	5.00	0.00	0.32	0.32
7.70	3.23	0.29	5.00	0.00	0.32	0.32
7.75	3.23	0.29	5.00	0.00	0.32	0.32
7.80	3.23	0.29	5.00	0.00	0.32	0.32
7.85	3.23	0.29	5.00	0.00	0.32	0.32
7.90	3.23	0.29	5.00	0.00	0.32	0.32
7.95	3.23	0.29	5.00	0.00	0.32	0.32
8.00	3.23	0.29	5.00	0.00	0.32	0.32
8.05	3.23	0.29	5.00	0.00	0.32	0.32
8.10	3.23	0.29	5.00	0.00	0.32	0.32
8.15	3.23	0.29	5.00	0.00	0.32	0.32
8.20	3.23	0.29	5.00	0.00	0.32	0.32
8.25	3.23	0.29	5.00	0.00	0.32	0.32
8.30	3.23	0.29	5.00	0.00	0.32	0.32
8.35	3.23	0.29	5.00	0.00	0.32	0.32
8.40	3.23	0.29	5.00	0.00	0.32	0.32
8.45	3.23	0.29	5.00	0.00	0.32	0.32
8.50	3.23	0.29	5.00	0.00	0.32	0.32

8.55	3.23	0.29	5.00	0.00	0.32	0.32
8.60	3.23	0.29	5.00	0.00	0.32	0.32
8.65	3.23	0.29	5.00	0.00	0.32	0.32
8.70	3.23	0.29	5.00	0.00	0.32	0.32
8.75	3.23	0.29	5.00	0.00	0.32	0.32
8.80	3.23	0.29	5.00	0.00	0.32	0.32
8.85	3.23	0.29	5.00	0.00	0.32	0.32
8.90	3.23	0.29	5.00	0.00	0.32	0.32
8.95	3.23	0.29	5.00	0.00	0.32	0.32
9.00	3.23	0.29	5.00	0.00	0.32	0.32
9.05	3.23	0.29	5.00	0.00	0.32	0.32
9.10	3.23	0.29	5.00	0.00	0.32	0.32
9.15	3.23	0.29	5.00	0.00	0.32	0.32
9.20	3.23	0.29	5.00	0.00	0.32	0.32
9.25	3.23	0.29	5.00	0.00	0.32	0.32
9.30	3.23	0.29	5.00	0.00	0.32	0.32
9.35	3.23	0.29	5.00	0.00	0.32	0.32
9.40	3.23	0.29	5.00	0.00	0.32	0.32
9.45	3.23	0.29	5.00	0.00	0.32	0.32
9.50	3.23	0.29	5.00	0.00	0.32	0.32
9.55	3.23	0.29	5.00	0.00	0.32	0.32
9.60	3.23	0.28	5.00	0.00	0.32	0.32
9.65	3.23	0.28	5.00	0.00	0.32	0.32
9.70	3.23	0.28	5.00	0.00	0.32	0.32
9.75	3.23	0.28	5.00	0.00	0.32	0.32
9.80	3.23	0.28	5.00	0.00	0.32	0.32
9.85	3.23	0.28	5.00	0.00	0.32	0.32
9.90	3.23	0.28	5.00	0.00	0.32	0.32
9.95	3.23	0.28	5.00	0.00	0.32	0.32
10.00	3.23	0.28	5.00	0.00	0.32	0.32
10.05	3.23	0.28	5.00	0.00	0.32	0.32
10.10	3.23	0.28	5.00	0.00	0.32	0.32
10.15	3.23	0.28	5.00	0.00	0.32	0.32
10.20	3.23	0.28	5.00	0.00	0.32	0.32
10.25	3.23	0.28	5.00	0.00	0.32	0.32
10.30	3.23	0.28	5.00	0.00	0.32	0.32
10.35	3.23	0.28	5.00	0.00	0.32	0.32
10.40	3.23	0.28	5.00	0.00	0.32	0.32
10.45	3.23	0.28	5.00	0.00	0.32	0.32
10.50	3.23	0.28	5.00	0.00	0.32	0.32
10.55	3.23	0.28	5.00	0.00	0.32	0.32
10.60	3.23	0.28	5.00	0.00	0.32	0.32
10.65	3.23	0.28	5.00	0.00	0.32	0.32
10.70	3.23	0.28	5.00	0.00	0.32	0.32
10.75	3.23	0.28	5.00	0.00	0.32	0.32
10.80	3.23	0.28	5.00	0.00	0.32	0.32
10.85	3.23	0.28	5.00	0.00	0.32	0.32
10.90	3.23	0.28	5.00	0.00	0.32	0.32
10.95	3.23	0.28	5.00	0.00	0.32	0.32
11.00	3.23	0.28	5.00	0.00	0.32	0.32
11.05	3.23	0.28	5.00	0.00	0.32	0.32
11.10	3.23	0.28	5.00	0.00	0.32	0.32
11.15	3.23	0.28	5.00	0.00	0.32	0.32
11.20	3.23	0.28	5.00	0.00	0.32	0.32
11.25	3.23	0.28	5.00	0.00	0.32	0.32
11.30	3.23	0.28	5.00	0.00	0.32	0.32
11.35	3.23	0.28	5.00	0.00	0.32	0.32
11.40	3.23	0.28	5.00	0.00	0.32	0.32

11.45	3.23	0.28	5.00	0.00	0.32	0.32
11.50	3.23	0.28	5.00	0.00	0.32	0.32
11.55	3.23	0.28	5.00	0.00	0.32	0.32
11.60	3.23	0.28	5.00	0.00	0.32	0.32
11.65	3.23	0.28	5.00	0.00	0.32	0.32
11.70	3.23	0.28	5.00	0.00	0.32	0.32
11.75	3.23	0.28	5.00	0.00	0.32	0.32
11.80	3.23	0.28	5.00	0.00	0.32	0.32
11.85	3.23	0.28	5.00	0.00	0.32	0.32
11.90	3.23	0.28	5.00	0.00	0.32	0.32
11.95	3.23	0.28	5.00	0.00	0.32	0.32
12.00	3.23	0.28	5.00	0.00	0.32	0.32
12.05	3.23	0.28	5.00	0.00	0.32	0.32
12.10	3.23	0.28	5.00	0.00	0.32	0.32
12.15	3.23	0.28	5.00	0.00	0.32	0.32
12.20	3.23	0.28	5.00	0.00	0.32	0.32
12.25	3.23	0.28	5.00	0.00	0.32	0.32
12.30	3.23	0.28	5.00	0.00	0.32	0.32
12.35	3.23	0.28	5.00	0.00	0.32	0.32
12.40	3.23	0.28	5.00	0.00	0.32	0.32
12.45	3.23	0.28	5.00	0.00	0.32	0.32
12.50	3.23	0.28	5.00	0.00	0.32	0.32
12.55	3.23	0.28	5.00	0.00	0.32	0.32
12.60	3.23	0.28	5.00	0.00	0.32	0.32
12.65	3.23	0.28	5.00	0.00	0.32	0.32
12.70	3.23	0.28	5.00	0.00	0.32	0.32
12.75	3.23	0.28	5.00	0.00	0.32	0.32
12.80	3.23	0.28	5.00	0.00	0.32	0.32
12.85	3.23	0.28	5.00	0.00	0.32	0.32
12.90	3.23	0.28	5.00	0.00	0.32	0.32
12.95	3.23	0.28	5.00	0.00	0.32	0.32
13.00	3.23	0.28	5.00	0.00	0.32	0.32
13.05	3.23	0.28	5.00	0.00	0.32	0.32
13.10	3.23	0.28	5.00	0.00	0.32	0.32
13.15	3.23	0.28	5.00	0.00	0.32	0.32
13.20	3.23	0.28	5.00	0.00	0.32	0.32
13.25	3.23	0.28	5.00	0.00	0.32	0.32
13.30	3.23	0.28	5.00	0.00	0.32	0.32
13.35	3.23	0.28	5.00	0.00	0.32	0.32
13.40	3.23	0.28	5.00	0.00	0.32	0.32
13.45	3.23	0.28	5.00	0.00	0.32	0.32
13.50	3.23	0.28	5.00	0.00	0.32	0.32
13.55	3.23	0.28	5.00	0.00	0.32	0.32
13.60	3.23	0.28	5.00	0.00	0.32	0.32
13.65	3.23	0.28	5.00	0.00	0.32	0.32
13.70	3.23	0.28	5.00	0.00	0.32	0.32
13.75	3.23	0.28	5.00	0.00	0.32	0.32
13.80	3.23	0.28	5.00	0.00	0.32	0.32
13.85	3.23	0.28	5.00	0.00	0.32	0.32
13.90	3.23	0.28	5.00	0.00	0.32	0.32
13.95	3.23	0.28	5.00	0.00	0.32	0.32
14.00	3.23	0.28	5.00	0.00	0.32	0.32
14.05	3.23	0.28	5.00	0.00	0.32	0.32
14.10	3.23	0.28	5.00	0.00	0.32	0.32
14.15	3.23	0.28	5.00	0.00	0.32	0.32
14.20	3.23	0.28	5.00	0.00	0.32	0.32
14.25	3.23	0.28	5.00	0.00	0.32	0.32
14.30	3.23	0.28	5.00	0.00	0.32	0.32

14.35	3.23	0.28	5.00	0.00	0.32	0.32
14.40	3.23	0.28	5.00	0.00	0.32	0.32
14.45	3.23	0.28	5.00	0.00	0.32	0.32
14.50	3.23	0.28	5.00	0.00	0.32	0.32
14.55	3.23	0.28	5.00	0.00	0.32	0.32
14.60	3.23	0.28	5.00	0.00	0.32	0.32
14.65	3.23	0.28	5.00	0.00	0.32	0.32
14.70	3.23	0.28	5.00	0.00	0.32	0.32
14.75	3.23	0.28	5.00	0.00	0.32	0.32
14.80	3.23	0.28	5.00	0.00	0.32	0.32
14.85	3.23	0.28	5.00	0.00	0.31	0.31
14.90	3.23	0.28	5.00	0.00	0.31	0.31
14.95	3.23	0.28	5.00	0.00	0.31	0.31
15.00	3.23	0.28	5.00	0.00	0.31	0.31
15.05	3.23	0.28	5.00	0.00	0.31	0.31
15.10	3.23	0.28	5.00	0.00	0.31	0.31
15.15	3.23	0.28	5.00	0.00	0.31	0.31
15.20	3.23	0.28	5.00	0.00	0.31	0.31
15.25	3.23	0.28	5.00	0.00	0.31	0.31
15.30	3.23	0.28	5.00	0.00	0.31	0.31
15.35	3.23	0.28	5.00	0.00	0.31	0.31
15.40	3.23	0.28	5.00	0.00	0.31	0.31
15.45	3.23	0.28	5.00	0.00	0.31	0.31
15.50	3.23	0.28	5.00	0.00	0.31	0.31
15.55	3.23	0.28	5.00	0.00	0.31	0.31
15.60	3.23	0.28	5.00	0.00	0.31	0.31
15.65	3.23	0.28	5.00	0.00	0.31	0.31
15.70	3.23	0.28	5.00	0.00	0.31	0.31
15.75	3.23	0.28	5.00	0.00	0.31	0.31
15.80	3.23	0.28	5.00	0.00	0.31	0.31
15.85	3.23	0.28	5.00	0.00	0.31	0.31
15.90	3.23	0.28	5.00	0.00	0.31	0.31
15.95	3.23	0.28	5.00	0.00	0.31	0.31
16.00	3.23	0.28	5.00	0.00	0.31	0.31
16.05	3.23	0.28	5.00	0.00	0.31	0.31
16.10	3.23	0.28	5.00	0.00	0.31	0.31
16.15	3.23	0.28	5.00	0.00	0.31	0.31
16.20	3.23	0.28	5.00	0.00	0.31	0.31
16.25	3.23	0.28	5.00	0.00	0.31	0.31
16.30	3.23	0.28	5.00	0.00	0.31	0.31
16.35	3.23	0.28	5.00	0.00	0.31	0.31
16.40	3.23	0.28	5.00	0.00	0.31	0.31
16.45	3.23	0.28	5.00	0.00	0.31	0.31
16.50	3.23	0.28	5.00	0.00	0.31	0.31
16.55	3.23	0.28	5.00	0.00	0.31	0.31
16.60	3.23	0.28	5.00	0.00	0.31	0.31
16.65	3.23	0.28	5.00	0.00	0.31	0.31
16.70	3.23	0.28	5.00	0.00	0.31	0.31
16.75	3.23	0.28	5.00	0.00	0.31	0.31
16.80	3.23	0.28	5.00	0.00	0.31	0.31
16.85	3.23	0.28	5.00	0.00	0.31	0.31
16.90	3.23	0.28	5.00	0.00	0.31	0.31
16.95	3.23	0.28	5.00	0.00	0.31	0.31
17.00	3.23	0.28	5.00	0.00	0.31	0.31
17.05	3.23	0.28	5.00	0.00	0.31	0.31
17.10	3.23	0.28	5.00	0.00	0.31	0.31
17.15	3.23	0.28	5.00	0.00	0.31	0.31
17.20	3.23	0.28	5.00	0.00	0.31	0.31

17.25	3.23	0.28	5.00	0.00	0.31	0.31
17.30	3.23	0.28	5.00	0.00	0.31	0.31
17.35	3.23	0.28	5.00	0.00	0.31	0.31
17.40	3.23	0.28	5.00	0.00	0.31	0.31
17.45	3.23	0.28	5.00	0.00	0.31	0.31
17.50	3.23	0.28	5.00	0.00	0.31	0.31
17.55	3.23	0.28	5.00	0.00	0.31	0.31
17.60	3.23	0.28	5.00	0.00	0.31	0.31
17.65	3.23	0.28	5.00	0.00	0.31	0.31
17.70	3.23	0.28	5.00	0.00	0.31	0.31
17.75	3.23	0.28	5.00	0.00	0.31	0.31
17.80	3.23	0.28	5.00	0.00	0.31	0.31
17.85	3.23	0.28	5.00	0.00	0.31	0.31
17.90	3.23	0.28	5.00	0.00	0.31	0.31
17.95	3.23	0.28	5.00	0.00	0.31	0.31
18.00	3.23	0.28	5.00	0.00	0.31	0.31
18.05	3.23	0.28	5.00	0.00	0.31	0.31
18.10	3.23	0.28	5.00	0.00	0.31	0.31
18.15	3.23	0.28	5.00	0.00	0.31	0.31
18.20	3.23	0.28	5.00	0.00	0.31	0.31
18.25	3.23	0.28	5.00	0.00	0.31	0.31
18.30	3.23	0.28	5.00	0.00	0.31	0.31
18.35	3.23	0.28	5.00	0.00	0.31	0.31
18.40	3.23	0.28	5.00	0.00	0.31	0.31
18.45	3.23	0.28	5.00	0.00	0.31	0.31
18.50	3.23	0.28	5.00	0.00	0.31	0.31
18.55	3.23	0.28	5.00	0.00	0.31	0.31
18.60	3.23	0.28	5.00	0.00	0.31	0.31
18.65	3.23	0.28	5.00	0.00	0.31	0.31
18.70	3.23	0.28	5.00	0.00	0.31	0.31
18.75	3.23	0.28	5.00	0.00	0.31	0.31
18.80	3.23	0.28	5.00	0.00	0.31	0.31
18.85	3.23	0.28	5.00	0.00	0.31	0.31
18.90	3.23	0.28	5.00	0.00	0.31	0.31
18.95	3.23	0.28	5.00	0.00	0.31	0.31
19.00	3.23	0.28	5.00	0.00	0.31	0.31
19.05	3.23	0.28	5.00	0.00	0.31	0.31
19.10	3.23	0.28	5.00	0.00	0.31	0.31
19.15	3.23	0.28	5.00	0.00	0.31	0.31
19.20	3.23	0.28	5.00	0.00	0.31	0.31
19.25	3.23	0.28	5.00	0.00	0.31	0.31
19.30	3.23	0.28	5.00	0.00	0.31	0.31
19.35	3.23	0.28	5.00	0.00	0.31	0.31
19.40	3.23	0.28	5.00	0.00	0.31	0.31
19.45	3.23	0.28	5.00	0.00	0.31	0.31
19.50	3.23	0.28	5.00	0.00	0.31	0.31
19.55	3.23	0.28	5.00	0.00	0.31	0.31
19.60	3.23	0.28	5.00	0.00	0.31	0.31
19.65	3.23	0.28	5.00	0.00	0.31	0.31
19.70	3.23	0.28	5.00	0.00	0.31	0.31
19.75	3.23	0.28	5.00	0.00	0.31	0.31
19.80	3.23	0.28	5.00	0.00	0.31	0.31
19.85	3.23	0.28	5.00	0.00	0.31	0.31
19.90	3.23	0.28	5.00	0.00	0.31	0.31
19.95	3.23	0.28	5.00	0.00	0.31	0.31
20.00	3.23	0.28	5.00	0.00	0.31	0.31
20.05	3.23	0.28	5.00	0.00	0.31	0.31
20.10	3.23	0.28	5.00	0.00	0.31	0.31

20.15	3.23	0.28	5.00	0.00	0.31	0.31
20.20	3.23	0.28	5.00	0.00	0.31	0.31
20.25	3.23	0.28	5.00	0.00	0.31	0.31
20.30	3.23	0.28	5.00	0.00	0.31	0.31
20.35	3.23	0.28	5.00	0.00	0.31	0.31
20.40	3.23	0.28	5.00	0.00	0.31	0.31
20.45	3.23	0.28	5.00	0.00	0.31	0.31
20.50	3.23	0.28	5.00	0.00	0.31	0.31
20.55	3.23	0.28	5.00	0.00	0.31	0.31
20.60	3.23	0.28	5.00	0.00	0.31	0.31
20.65	3.23	0.28	5.00	0.00	0.31	0.31
20.70	3.23	0.28	5.00	0.00	0.31	0.31
20.75	3.23	0.28	5.00	0.00	0.31	0.31
20.80	3.23	0.28	5.00	0.00	0.31	0.31
20.85	3.23	0.28	5.00	0.00	0.31	0.31
20.90	3.23	0.28	5.00	0.00	0.31	0.31
20.95	3.23	0.28	5.00	0.00	0.31	0.31
21.00	3.23	0.28	5.00	0.00	0.31	0.31
21.05	3.23	0.28	5.00	0.00	0.31	0.31
21.10	3.23	0.28	5.00	0.00	0.31	0.31
21.15	3.23	0.28	5.00	0.00	0.31	0.31
21.20	3.23	0.28	5.00	0.00	0.31	0.31
21.25	3.23	0.28	5.00	0.00	0.31	0.31
21.30	3.23	0.28	5.00	0.00	0.31	0.31
21.35	3.23	0.28	5.00	0.00	0.31	0.31
21.40	3.23	0.28	5.00	0.00	0.30	0.30
21.45	3.23	0.28	5.00	0.00	0.30	0.30
21.50	3.23	0.28	5.00	0.00	0.30	0.30
21.55	3.23	0.28	5.00	0.00	0.30	0.30
21.60	3.23	0.28	5.00	0.00	0.30	0.30
21.65	3.23	0.28	5.00	0.00	0.30	0.30
21.70	3.23	0.28	5.00	0.00	0.30	0.30
21.75	3.23	0.28	5.00	0.00	0.30	0.30
21.80	3.23	0.28	5.00	0.00	0.30	0.30
21.85	3.23	0.28	5.00	0.00	0.30	0.30
21.90	3.23	0.28	5.00	0.00	0.30	0.30
21.95	3.23	0.28	5.00	0.00	0.30	0.30
22.00	3.23	0.28	5.00	0.00	0.30	0.30
22.05	3.23	0.28	5.00	0.00	0.30	0.30
22.10	3.23	0.28	5.00	0.00	0.30	0.30
22.15	3.23	0.28	5.00	0.00	0.30	0.30
22.20	3.23	0.28	5.00	0.00	0.30	0.30
22.25	3.23	0.28	5.00	0.00	0.30	0.30
22.30	3.23	0.28	5.00	0.00	0.30	0.30
22.35	3.23	0.28	5.00	0.00	0.30	0.30
22.40	3.23	0.28	5.00	0.00	0.30	0.30
22.45	3.23	0.28	5.00	0.00	0.30	0.30
22.50	3.23	0.28	5.00	0.00	0.30	0.30
22.55	3.23	0.28	5.00	0.00	0.30	0.30
22.60	3.23	0.28	5.00	0.00	0.30	0.30
22.65	3.23	0.28	5.00	0.00	0.30	0.30
22.70	3.23	0.28	5.00	0.00	0.30	0.30
22.75	3.23	0.28	5.00	0.00	0.30	0.30
22.80	3.23	0.28	5.00	0.00	0.30	0.30
22.85	3.23	0.28	5.00	0.00	0.30	0.30
22.90	3.23	0.28	5.00	0.00	0.30	0.30
22.95	3.23	0.28	5.00	0.00	0.30	0.30
23.00	0.71	0.28	5.00	0.00	0.30	0.30

23.05	0.64	0.28	5.00	0.00	0.30	0.30
23.10	0.60	0.28	5.00	0.00	0.30	0.30
23.15	0.57	0.28	5.00	0.00	0.30	0.30
23.20	0.55	0.28	5.00	0.00	0.30	0.30
23.25	0.53	0.28	5.00	0.00	0.30	0.30
23.30	0.51	0.28	5.00	0.00	0.30	0.30
23.35	0.50	0.28	5.00	0.00	0.30	0.30
23.40	0.48	0.28	5.00	0.00	0.30	0.30
23.45	0.47	0.28	5.00	0.00	0.30	0.30
23.50	0.46	0.28	5.00	0.00	0.30	0.30
23.55	0.46	0.28	5.00	0.00	0.30	0.30
23.60	0.46	0.28	5.00	0.00	0.30	0.30
23.65	0.46	0.28	5.00	0.00	0.30	0.30
23.70	0.47	0.28	5.00	0.00	0.30	0.30
23.75	0.47	0.28	5.00	0.00	0.30	0.30
23.80	0.47	0.28	5.00	0.00	0.30	0.30
23.85	0.47	0.28	5.00	0.00	0.29	0.29
23.90	0.48	0.28	5.00	0.00	0.29	0.29
23.95	0.48	0.28	5.00	0.00	0.29	0.29
24.00	0.48	0.28	5.00	0.00	0.29	0.29
24.05	0.49	0.28	5.00	0.00	0.29	0.29
24.10	0.49	0.28	5.00	0.00	0.29	0.29
24.15	0.49	0.28	5.00	0.00	0.29	0.29
24.20	0.49	0.28	5.00	0.00	0.29	0.29
24.25	0.50	0.28	5.00	0.00	0.29	0.29
24.30	0.50	0.28	5.00	0.00	0.29	0.29
24.35	0.50	0.27	5.00	0.00	0.29	0.29
24.40	0.51	0.27	5.00	0.00	0.29	0.29
24.45	0.51	0.27	5.00	0.00	0.29	0.29
24.50	0.51	0.27	5.00	0.00	0.29	0.29
24.55	0.52	0.27	5.00	0.00	0.29	0.29
24.60	0.52	0.27	5.00	0.00	0.29	0.29
24.65	0.52	0.27	5.00	0.00	0.29	0.29
24.70	0.53	0.27	5.00	0.00	0.29	0.29
24.75	0.53	0.27	5.00	0.00	0.29	0.29
24.80	0.53	0.27	5.00	0.00	0.29	0.29
24.85	0.54	0.27	5.00	0.00	0.29	0.29
24.90	0.54	0.27	5.00	0.00	0.29	0.29
24.95	0.55	0.27	5.00	0.00	0.29	0.29
25.00	0.55	0.27	5.00	0.00	0.29	0.29
25.05	0.55	0.27	5.00	0.00	0.29	0.29
25.10	0.56	0.27	5.00	0.00	0.29	0.29
25.15	0.56	0.27	5.00	0.00	0.29	0.29
25.20	0.57	0.27	5.00	0.00	0.29	0.29
25.25	0.57	0.27	5.00	0.00	0.29	0.29
25.30	0.57	0.27	5.00	0.00	0.29	0.29
25.35	0.58	0.27	5.00	0.00	0.29	0.29
25.40	0.58	0.27	5.00	0.00	0.28	0.28
25.45	0.59	0.27	5.00	0.00	0.28	0.28
25.50	0.60	0.27	5.00	0.00	0.28	0.28
25.55	0.60	0.27	5.00	0.00	0.28	0.28
25.60	0.61	0.27	5.00	0.00	0.28	0.28
25.65	0.61	0.27	5.00	0.00	0.28	0.28
25.70	0.62	0.27	5.00	0.00	0.28	0.28
25.75	0.63	0.27	5.00	0.00	0.28	0.28
25.80	0.64	0.27	5.00	0.00	0.28	0.28
25.85	0.65	0.27	5.00	0.00	0.28	0.28
25.90	0.66	0.27	5.00	0.00	0.28	0.28

25.95	0.67	0.27	5.00	0.00	0.28	0.28
26.00	0.68	0.27	5.00	0.00	0.28	0.28
26.05	0.70	0.27	5.00	0.00	0.28	0.28
26.10	0.72	0.27	5.00	0.00	0.28	0.28
26.15	0.76	0.27	5.00	0.00	0.28	0.28
26.20	3.25	0.27	5.00	0.00	0.28	0.28
26.25	3.25	0.27	5.00	0.00	0.28	0.28
26.30	3.24	0.27	5.00	0.00	0.28	0.28
26.35	3.24	0.27	5.00	0.00	0.28	0.28
26.40	3.24	0.27	5.00	0.00	0.28	0.28
26.45	3.24	0.27	5.00	0.00	0.28	0.28
26.50	3.24	0.27	5.00	0.00	0.28	0.28
26.55	3.24	0.27	5.00	0.00	0.28	0.28
26.60	3.24	0.27	5.00	0.00	0.28	0.28
26.65	3.24	0.27	5.00	0.00	0.28	0.28
26.70	3.24	0.27	5.00	0.00	0.28	0.28
26.75	3.24	0.27	5.00	0.00	0.28	0.28
26.80	3.24	0.27	5.00	0.00	0.28	0.28
26.85	3.23	0.27	5.00	0.00	0.28	0.28
26.90	3.23	0.27	5.00	0.00	0.28	0.28
26.95	3.23	0.27	5.00	0.00	0.28	0.28
27.00	3.23	0.27	5.00	0.00	0.28	0.28
27.05	3.23	0.27	5.00	0.00	0.28	0.28
27.10	3.23	0.27	5.00	0.00	0.28	0.28
27.15	3.23	0.27	5.00	0.00	0.28	0.28
27.20	3.23	0.27	5.00	0.00	0.28	0.28
27.25	3.23	0.27	5.00	0.00	0.27	0.27
27.30	3.23	0.27	5.00	0.00	0.27	0.27
27.35	3.23	0.27	5.00	0.00	0.27	0.27
27.40	3.22	0.27	5.00	0.00	0.27	0.27
27.45	3.22	0.27	5.00	0.00	0.27	0.27
27.50	3.22	0.27	5.00	0.00	0.27	0.27
27.55	3.22	0.27	5.00	0.00	0.27	0.27
27.60	3.22	0.27	5.00	0.00	0.27	0.27
27.65	3.22	0.27	5.00	0.00	0.27	0.27
27.70	3.22	0.27	5.00	0.00	0.27	0.27
27.75	3.22	0.27	5.00	0.00	0.27	0.27
27.80	3.22	0.27	5.00	0.00	0.27	0.27
27.85	3.22	0.27	5.00	0.00	0.27	0.27
27.90	3.22	0.27	5.00	0.00	0.27	0.27
27.95	3.21	0.27	5.00	0.00	0.27	0.27
28.00	3.21	0.27	5.00	0.00	0.27	0.27
28.05	3.21	0.27	5.00	0.00	0.27	0.27
28.10	3.21	0.27	5.00	0.00	0.27	0.27
28.15	3.21	0.27	5.00	0.00	0.27	0.27
28.20	3.21	0.27	5.00	0.00	0.27	0.27
28.25	3.21	0.27	5.00	0.00	0.27	0.27
28.30	3.21	0.27	5.00	0.00	0.27	0.27
28.35	3.21	0.27	5.00	0.00	0.27	0.27
28.40	3.21	0.27	5.00	0.00	0.27	0.27
28.45	3.21	0.27	5.00	0.00	0.27	0.27
28.50	3.20	0.27	5.00	0.00	0.27	0.27
28.55	3.20	0.27	5.00	0.00	0.27	0.27
28.60	3.20	0.27	5.00	0.00	0.27	0.27
28.65	3.20	0.27	5.00	0.00	0.27	0.27
28.70	3.20	0.27	5.00	0.00	0.27	0.27
28.75	3.20	0.27	5.00	0.00	0.27	0.27
28.80	3.20	0.27	5.00	0.00	0.27	0.27

28.85	3.20	0.27	5.00	0.00	0.27	0.27
28.90	3.20	0.27	5.00	0.00	0.27	0.27
28.95	3.20	0.27	5.00	0.00	0.27	0.27
29.00	3.20	0.27	5.00	0.00	0.27	0.27
29.05	3.20	0.27	5.00	0.00	0.27	0.27
29.10	3.19	0.27	5.00	0.00	0.27	0.27
29.15	3.19	0.27	5.00	0.00	0.27	0.27
29.20	3.19	0.27	5.00	0.00	0.27	0.27
29.25	3.19	0.27	5.00	0.00	0.27	0.27
29.30	3.19	0.27	5.00	0.00	0.27	0.27
29.35	3.19	0.27	5.00	0.00	0.27	0.27
29.40	3.19	0.27	5.00	0.00	0.27	0.27
29.45	3.19	0.27	5.00	0.00	0.26	0.26
29.50	3.19	0.27	5.00	0.00	0.26	0.26
29.55	3.19	0.27	5.00	0.00	0.26	0.26
29.60	3.19	0.27	5.00	0.00	0.26	0.26
29.65	3.18	0.27	5.00	0.00	0.26	0.26
29.70	3.18	0.27	5.00	0.00	0.26	0.26
29.75	3.18	0.27	5.00	0.00	0.26	0.26
29.80	3.18	0.27	5.00	0.00	0.26	0.26
29.85	3.18	0.27	5.00	0.00	0.26	0.26
29.90	3.18	0.27	5.00	0.00	0.26	0.26
29.95	3.18	0.27	5.00	0.00	0.26	0.26
30.00	3.18	0.27	5.00	0.00	0.26	0.26
30.05	3.18	0.27	5.00	0.00	0.26	0.26
30.10	0.75	0.27	5.00	0.00	0.26	0.26
30.15	0.71	0.27	5.00	0.00	0.26	0.26
30.20	0.68	0.27	5.00	0.00	0.26	0.26
30.25	0.66	0.27	5.00	0.00	0.26	0.26
30.30	0.65	0.27	5.00	0.00	0.26	0.26
30.35	0.63	0.27	5.00	0.00	0.26	0.26
30.40	0.62	0.27	5.00	0.00	0.26	0.26
30.45	0.61	0.27	5.00	0.00	0.26	0.26
30.50	0.60	0.27	5.00	0.00	0.26	0.26
30.55	0.60	0.27	5.00	0.00	0.26	0.26
30.60	0.59	0.27	5.00	0.00	0.26	0.26
30.65	0.58	0.27	5.00	0.00	0.26	0.26
30.70	0.58	0.27	5.00	0.00	0.26	0.26
30.75	0.57	0.27	5.00	0.00	0.26	0.26
30.80	0.56	0.27	5.00	0.00	0.26	0.26
30.85	0.56	0.27	5.00	0.00	0.26	0.26
30.90	0.55	0.27	5.00	0.00	0.26	0.26
30.95	0.55	0.27	5.00	0.00	0.26	0.26
31.00	0.54	0.27	5.00	0.00	0.26	0.26
31.05	0.54	0.27	5.00	0.00	0.25	0.25
31.10	0.53	0.27	5.00	0.00	0.25	0.25
31.15	0.53	0.27	5.00	0.00	0.25	0.25
31.20	0.53	0.27	5.00	0.00	0.25	0.25
31.25	0.52	0.27	5.00	0.00	0.25	0.25
31.30	0.52	0.27	5.00	0.00	0.25	0.25
31.35	0.51	0.27	5.00	0.00	0.25	0.25
31.40	0.51	0.27	5.00	0.00	0.25	0.25
31.45	0.51	0.27	5.00	0.00	0.25	0.25
31.50	0.50	0.27	5.00	0.00	0.25	0.25
31.55	0.50	0.27	5.00	0.00	0.25	0.25
31.60	0.49	0.27	5.00	0.00	0.25	0.25
31.65	0.49	0.27	5.00	0.00	0.25	0.25
31.70	0.49	0.27	5.00	0.00	0.25	0.25

31.75	0.48	0.27	5.00	0.00	0.25	0.25
31.80	0.48	0.27	5.00	0.00	0.25	0.25
31.85	0.48	0.27	5.00	0.00	0.25	0.25
31.90	0.47	0.27	5.00	0.00	0.25	0.25
31.95	0.47	0.27	5.00	0.00	0.25	0.25
32.00	0.47	0.27	5.00	0.00	0.25	0.25
32.05	0.46	0.27	5.00	0.00	0.25	0.25
32.10	0.46	0.27	5.00	0.00	0.25	0.25
32.15	0.46	0.27	5.00	0.00	0.25	0.25
32.20	0.46	0.27	5.00	0.00	0.25	0.25
32.25	0.45	0.27	5.00	0.00	0.25	0.25
32.30	0.45	0.27	5.00	0.00	0.24	0.24
32.35	0.45	0.27	5.00	0.00	0.24	0.24
32.40	0.44	0.27	5.00	0.00	0.24	0.24
32.45	0.44	0.27	5.00	0.00	0.24	0.24
32.50	0.44	0.27	5.00	0.00	0.24	0.24
32.55	0.44	0.27	5.00	0.00	0.24	0.24
32.60	0.43	0.26	5.00	0.00	0.24	0.24
32.65	0.43	0.26	5.00	0.00	0.24	0.24
32.70	0.43	0.26	5.00	0.00	0.24	0.24
32.75	0.43	0.26	5.00	0.00	0.24	0.24
32.80	0.42	0.26	5.00	0.00	0.24	0.24
32.85	0.42	0.26	5.00	0.00	0.24	0.24
32.90	0.42	0.26	5.00	0.00	0.24	0.24
32.95	0.42	0.26	5.00	0.00	0.24	0.24
33.00	0.41	0.26	5.00	0.00	0.24	0.24
33.05	0.41	0.26	5.00	0.00	0.24	0.24
33.10	0.41	0.26	5.00	0.00	0.24	0.24
33.15	0.41	0.26	5.00	0.00	0.24	0.24
33.20	0.41	0.26	5.00	0.00	0.24	0.24
33.25	0.41	0.26	5.00	0.00	0.24	0.24
33.30	0.40	0.26	5.00	0.00	0.23	0.23
33.35	0.40	0.26	5.00	0.00	0.23	0.23
33.40	0.40	0.26	5.00	0.00	0.23	0.23
33.45	0.40	0.26	5.00	0.00	0.23	0.23
33.50	0.40	0.26	5.00	0.00	0.23	0.23
33.55	0.40	0.26	5.00	0.00	0.23	0.23
33.60	0.40	0.26	5.00	0.00	0.23	0.23
33.65	0.40	0.26	5.00	0.00	0.23	0.23
33.70	0.39	0.26	5.00	0.00	0.23	0.23
33.75	0.39	0.26	5.00	0.00	0.23	0.23
33.80	0.39	0.26	5.00	0.00	0.23	0.23
33.85	0.39	0.26	5.00	0.00	0.23	0.23
33.90	0.39	0.26	5.00	0.00	0.23	0.23
33.95	0.39	0.26	5.00	0.00	0.23	0.23
34.00	0.39	0.26	5.00	0.00	0.23	0.23
34.05	0.38	0.26	5.00	0.00	0.23	0.23
34.10	0.38	0.26	5.00	0.00	0.23	0.23
34.15	0.38	0.26	5.00	0.00	0.23	0.23
34.20	0.38	0.26	5.00	0.00	0.22	0.22
34.25	0.38	0.26	5.00	0.00	0.22	0.22
34.30	0.38	0.26	5.00	0.00	0.22	0.22
34.35	0.38	0.26	5.00	0.00	0.22	0.22
34.40	0.38	0.26	5.00	0.00	0.22	0.22
34.45	0.38	0.26	5.00	0.00	0.22	0.22
34.50	0.37	0.26	5.00	0.00	0.22	0.22
34.55	0.37	0.26	5.00	0.00	0.22	0.22
34.60	0.37	0.26	5.00	0.00	0.22	0.22

34.65	0.37	0.26	5.00	0.00	0.22	0.22
34.70	0.37	0.26	5.00	0.00	0.22	0.22
34.75	0.37	0.26	5.00	0.00	0.22	0.22
34.80	0.37	0.26	5.00	0.00	0.22	0.22
34.85	0.37	0.26	5.00	0.00	0.22	0.22
34.90	0.37	0.26	5.00	0.00	0.22	0.22
34.95	0.36	0.26	5.00	0.00	0.22	0.22
35.00	0.36	0.26	5.00	0.00	0.21	0.21
35.05	0.36	0.26	5.00	0.00	0.21	0.21
35.10	0.36	0.26	5.00	0.00	0.21	0.21
35.15	0.36	0.26	5.00	0.00	0.21	0.21
35.20	0.36	0.26	5.00	0.00	0.21	0.21
35.25	0.36	0.26	5.00	0.00	0.21	0.21
35.30	0.36	0.26	5.00	0.00	0.21	0.21
35.35	0.36	0.26	5.00	0.00	0.21	0.21
35.40	0.35	0.26	5.00	0.00	0.21	0.21
35.45	0.35	0.26	5.00	0.00	0.21	0.21
35.50	0.35	0.26	5.00	0.00	0.21	0.21
35.55	0.35	0.26	5.00	0.00	0.21	0.21
35.60	0.35	0.26	5.00	0.00	0.21	0.21
35.65	0.35	0.26	5.00	0.00	0.21	0.21
35.70	0.35	0.26	5.00	0.00	0.21	0.21
35.75	0.35	0.26	5.00	0.00	0.20	0.20
35.80	0.35	0.26	5.00	0.00	0.20	0.20
35.85	0.35	0.26	5.00	0.00	0.20	0.20
35.90	0.34	0.26	5.00	0.00	0.20	0.20
35.95	0.34	0.26	5.00	0.00	0.20	0.20
36.00	0.34	0.26	5.00	0.00	0.20	0.20
36.05	0.34	0.26	5.00	0.00	0.20	0.20
36.10	0.34	0.26	5.00	0.00	0.20	0.20
36.15	0.34	0.26	5.00	0.00	0.20	0.20
36.20	0.34	0.26	5.00	0.00	0.20	0.20
36.25	0.34	0.26	5.00	0.00	0.20	0.20
36.30	0.34	0.26	5.00	0.00	0.20	0.20
36.35	0.34	0.26	5.00	0.00	0.20	0.20
36.40	0.34	0.26	5.00	0.00	0.19	0.19
36.45	0.33	0.26	5.00	0.00	0.19	0.19
36.50	0.33	0.26	5.00	0.00	0.19	0.19
36.55	0.33	0.26	5.00	0.00	0.19	0.19
36.60	0.33	0.26	5.00	0.00	0.19	0.19
36.65	0.33	0.26	5.00	0.00	0.19	0.19
36.70	0.33	0.26	5.00	0.00	0.19	0.19
36.75	0.33	0.26	5.00	0.00	0.19	0.19
36.80	0.33	0.25	5.00	0.00	0.19	0.19
36.85	0.33	0.25	5.00	0.00	0.19	0.19
36.90	0.33	0.25	5.00	0.00	0.19	0.19
36.95	0.33	0.25	5.00	0.00	0.19	0.19
37.00	0.32	0.25	5.00	0.00	0.19	0.19
37.05	0.32	0.25	5.00	0.00	0.18	0.18
37.10	0.32	0.25	5.00	0.00	0.18	0.18
37.15	0.32	0.25	5.00	0.00	0.18	0.18
37.20	0.32	0.25	5.00	0.00	0.18	0.18
37.25	0.32	0.25	5.00	0.00	0.18	0.18
37.30	0.32	0.25	5.00	0.00	0.18	0.18
37.35	0.32	0.25	5.00	0.00	0.18	0.18
37.40	0.32	0.25	5.00	0.00	0.18	0.18
37.45	0.32	0.25	5.00	0.00	0.18	0.18
37.50	0.32	0.25	5.00	0.00	0.18	0.18

37.55	0.32	0.25	5.00	0.00	0.18	0.18
37.60	0.31	0.25	5.00	0.00	0.18	0.18
37.65	0.31	0.25	5.00	0.00	0.17	0.17
37.70	0.31	0.25	5.00	0.00	0.17	0.17
37.75	0.31	0.25	5.00	0.00	0.17	0.17
37.80	0.31	0.25	5.00	0.00	0.17	0.17
37.85	0.31	0.25	5.00	0.00	0.17	0.17
37.90	0.31	0.25	5.00	0.00	0.17	0.17
37.95	0.31	0.25	5.00	0.00	0.17	0.17
38.00	0.31	0.25	5.00	0.00	0.17	0.17
38.05	0.31	0.25	5.00	0.00	0.17	0.17
38.10	0.31	0.25	5.00	0.00	0.17	0.17
38.15	0.31	0.25	5.00	0.00	0.17	0.17
38.20	0.31	0.25	5.00	0.00	0.16	0.16
38.25	0.31	0.25	5.00	0.00	0.16	0.16
38.30	0.31	0.25	5.00	0.00	0.16	0.16
38.35	0.31	0.25	5.00	0.00	0.16	0.16
38.40	0.31	0.25	5.00	0.00	0.16	0.16
38.45	0.31	0.25	5.00	0.00	0.16	0.16
38.50	0.31	0.25	5.00	0.00	0.16	0.16
38.55	0.31	0.25	5.00	0.00	0.16	0.16
38.60	0.31	0.25	5.00	0.00	0.16	0.16
38.65	0.31	0.25	5.00	0.00	0.16	0.16
38.70	0.31	0.25	5.00	0.00	0.16	0.16
38.75	0.31	0.25	5.00	0.00	0.15	0.15
38.80	0.31	0.25	5.00	0.00	0.15	0.15
38.85	0.31	0.25	5.00	0.00	0.15	0.15
38.90	0.31	0.25	5.00	0.00	0.15	0.15
38.95	0.31	0.25	5.00	0.00	0.15	0.15
39.00	0.31	0.25	5.00	0.00	0.15	0.15
39.05	0.31	0.25	5.00	0.00	0.15	0.15
39.10	0.31	0.25	5.00	0.00	0.15	0.15
39.15	0.31	0.25	5.00	0.00	0.15	0.15
39.20	0.31	0.25	5.00	0.00	0.15	0.15
39.25	0.31	0.25	5.00	0.00	0.15	0.15
39.30	0.31	0.25	5.00	0.00	0.15	0.15
39.35	0.31	0.25	5.00	0.00	0.14	0.14
39.40	0.31	0.25	5.00	0.00	0.14	0.14
39.45	0.31	0.25	5.00	0.00	0.14	0.14
39.50	0.31	0.25	5.00	0.00	0.14	0.14
39.55	0.31	0.25	5.00	0.00	0.14	0.14
39.60	0.31	0.25	5.00	0.00	0.14	0.14
39.65	0.31	0.25	5.00	0.00	0.14	0.14
39.70	0.31	0.25	5.00	0.00	0.14	0.14
39.75	0.31	0.25	5.00	0.00	0.14	0.14
39.80	0.31	0.25	5.00	0.00	0.14	0.14
39.85	0.31	0.25	5.00	0.00	0.14	0.14
39.90	0.31	0.25	5.00	0.00	0.13	0.13
39.95	0.31	0.25	5.00	0.00	0.13	0.13
40.00	0.31	0.25	5.00	0.00	0.13	0.13
40.05	0.31	0.25	5.00	0.00	0.13	0.13
40.10	0.31	0.25	5.00	0.00	0.13	0.13
40.15	0.31	0.25	5.00	0.00	0.13	0.13
40.20	0.31	0.25	5.00	0.00	0.13	0.13
40.25	0.31	0.25	5.00	0.00	0.13	0.13
40.30	0.31	0.25	5.00	0.00	0.13	0.13
40.35	0.31	0.25	5.00	0.00	0.13	0.13
40.40	0.31	0.25	5.00	0.00	0.13	0.13

40.45	0.31	0.25	5.00	0.00	0.12	0.12
40.50	0.31	0.25	5.00	0.00	0.12	0.12
40.55	0.31	0.25	5.00	0.00	0.12	0.12
40.60	0.31	0.25	5.00	0.00	0.12	0.12
40.65	0.31	0.25	5.00	0.00	0.12	0.12
40.70	0.31	0.25	5.00	0.00	0.12	0.12
40.75	0.31	0.25	5.00	0.00	0.12	0.12
40.80	0.31	0.25	5.00	0.00	0.12	0.12
40.85	0.31	0.25	5.00	0.00	0.12	0.12
40.90	0.31	0.25	5.00	0.00	0.12	0.12
40.95	0.31	0.25	5.00	0.00	0.12	0.12
41.00	0.31	0.24	5.00	0.00	0.12	0.12
41.05	0.31	0.24	5.00	0.00	0.12	0.12
41.10	0.31	0.24	5.00	0.00	0.12	0.12
41.15	0.31	0.24	5.00	0.00	0.11	0.11
41.20	0.31	0.24	5.00	0.00	0.11	0.11
41.25	0.31	0.24	5.00	0.00	0.11	0.11
41.30	0.31	0.24	5.00	0.00	0.11	0.11
41.35	0.31	0.24	5.00	0.00	0.11	0.11
41.40	0.31	0.24	5.00	0.00	0.11	0.11
41.45	0.31	0.24	5.00	0.00	0.11	0.11
41.50	0.31	0.24	5.00	0.00	0.11	0.11
41.55	0.31	0.24	5.00	0.00	0.11	0.11
41.60	0.31	0.24	5.00	0.00	0.11	0.11
41.65	0.31	0.24	5.00	0.00	0.11	0.11
41.70	0.31	0.24	5.00	0.00	0.11	0.11
41.75	0.31	0.24	5.00	0.00	0.11	0.11
41.80	0.31	0.24	5.00	0.00	0.11	0.11
41.85	0.31	0.24	5.00	0.00	0.11	0.11
41.90	0.31	0.24	5.00	0.00	0.11	0.11
41.95	0.31	0.24	5.00	0.00	0.10	0.10
42.00	0.31	0.24	5.00	0.00	0.10	0.10
42.05	0.31	0.24	5.00	0.00	0.10	0.10
42.10	0.31	0.24	5.00	0.00	0.10	0.10
42.15	0.31	0.24	5.00	0.00	0.10	0.10
42.20	0.31	0.24	5.00	0.00	0.10	0.10
42.25	0.31	0.24	5.00	0.00	0.10	0.10
42.30	0.31	0.24	5.00	0.00	0.10	0.10
42.35	0.31	0.24	5.00	0.00	0.10	0.10
42.40	0.31	0.24	5.00	0.00	0.10	0.10
42.45	0.31	0.24	5.00	0.00	0.10	0.10
42.50	0.31	0.24	5.00	0.00	0.10	0.10
42.55	0.31	0.24	5.00	0.00	0.10	0.10
42.60	0.31	0.24	5.00	0.00	0.10	0.10
42.65	0.31	0.24	5.00	0.00	0.10	0.10
42.70	0.31	0.24	5.00	0.00	0.10	0.10
42.75	0.31	0.24	5.00	0.00	0.09	0.09
42.80	0.31	0.24	5.00	0.00	0.09	0.09
42.85	0.31	0.24	5.00	0.00	0.09	0.09
42.90	0.31	0.24	5.00	0.00	0.09	0.09
42.95	0.31	0.24	5.00	0.00	0.09	0.09
43.00	0.31	0.24	5.00	0.00	0.09	0.09
43.05	0.31	0.24	5.00	0.00	0.09	0.09
43.10	0.31	0.24	5.00	0.00	0.09	0.09
43.15	0.31	0.24	5.00	0.00	0.09	0.09
43.20	0.31	0.24	5.00	0.00	0.09	0.09
43.25	0.31	0.24	5.00	0.00	0.09	0.09
43.30	0.31	0.24	5.00	0.00	0.09	0.09

43.35	0.31	0.24	5.00	0.00	0.09	0.09
43.40	0.31	0.24	5.00	0.00	0.09	0.09
43.45	0.31	0.24	5.00	0.00	0.09	0.09
43.50	0.31	0.24	5.00	0.00	0.09	0.09
43.55	0.31	0.24	5.00	0.00	0.08	0.08
43.60	0.31	0.24	5.00	0.00	0.08	0.08
43.65	0.31	0.24	5.00	0.00	0.08	0.08
43.70	0.31	0.24	5.00	0.00	0.08	0.08
43.75	0.31	0.24	5.00	0.00	0.08	0.08
43.80	0.31	0.24	5.00	0.00	0.08	0.08
43.85	0.31	0.24	5.00	0.00	0.08	0.08
43.90	0.31	0.24	5.00	0.00	0.08	0.08
43.95	0.31	0.24	5.00	0.00	0.08	0.08
44.00	0.31	0.24	5.00	0.00	0.08	0.08
44.05	0.31	0.24	5.00	0.00	0.08	0.08
44.10	0.31	0.24	5.00	0.00	0.08	0.08
44.15	0.31	0.24	5.00	0.00	0.08	0.08
44.20	0.31	0.24	5.00	0.00	0.08	0.08
44.25	0.31	0.24	5.00	0.00	0.08	0.08
44.30	0.31	0.24	5.00	0.00	0.08	0.08
44.35	0.31	0.24	5.00	0.00	0.07	0.07
44.40	0.31	0.24	5.00	0.00	0.07	0.07
44.45	0.31	0.24	5.00	0.00	0.07	0.07
44.50	0.31	0.24	5.00	0.00	0.07	0.07
44.55	0.31	0.24	5.00	0.00	0.07	0.07
44.60	0.30	0.24	5.00	0.00	0.07	0.07
44.65	0.30	0.24	5.00	0.00	0.07	0.07
44.70	0.30	0.24	5.00	0.00	0.07	0.07
44.75	0.30	0.24	5.00	0.00	0.07	0.07
44.80	0.30	0.24	5.00	0.00	0.07	0.07
44.85	0.30	0.24	5.00	0.00	0.07	0.07
44.90	0.30	0.24	5.00	0.00	0.07	0.07
44.95	0.30	0.24	5.00	0.00	0.07	0.07
45.00	0.30	0.24	5.00	0.00	0.07	0.07
45.05	0.30	0.24	5.00	0.00	0.07	0.07
45.10	0.30	0.24	5.00	0.00	0.07	0.07
45.15	0.30	0.24	5.00	0.00	0.06	0.06
45.20	0.30	0.24	5.00	0.00	0.06	0.06
45.25	0.30	0.23	5.00	0.00	0.06	0.06
45.30	0.30	0.23	5.00	0.00	0.06	0.06
45.35	0.30	0.23	5.00	0.00	0.06	0.06
45.40	0.30	0.23	5.00	0.00	0.06	0.06
45.45	0.30	0.23	5.00	0.00	0.06	0.06
45.50	0.30	0.23	5.00	0.00	0.06	0.06
45.55	0.30	0.23	5.00	0.00	0.06	0.06
45.60	0.30	0.23	5.00	0.00	0.06	0.06
45.65	0.30	0.23	5.00	0.00	0.06	0.06
45.70	0.30	0.23	5.00	0.00	0.06	0.06
45.75	0.30	0.23	5.00	0.00	0.06	0.06
45.80	0.30	0.23	5.00	0.00	0.06	0.06
45.85	0.30	0.23	5.00	0.00	0.06	0.06
45.90	0.30	0.23	5.00	0.00	0.06	0.06
45.95	0.30	0.23	5.00	0.00	0.05	0.05
46.00	0.30	0.23	5.00	0.00	0.05	0.05
46.05	0.30	0.23	5.00	0.00	0.05	0.05
46.10	0.30	0.23	5.00	0.00	0.05	0.05
46.15	0.30	0.23	5.00	0.00	0.05	0.05
46.20	0.30	0.23	5.00	0.00	0.05	0.05

46.25	0.30	0.23	5.00	0.00	0.05	0.05
46.30	0.30	0.23	5.00	0.00	0.05	0.05
46.35	0.30	0.23	5.00	0.00	0.05	0.05
46.40	0.30	0.23	5.00	0.00	0.05	0.05
46.45	0.30	0.23	5.00	0.00	0.05	0.05
46.50	0.30	0.23	5.00	0.00	0.05	0.05
46.55	0.30	0.23	5.00	0.00	0.05	0.05
46.60	0.30	0.23	5.00	0.00	0.05	0.05
46.65	0.30	0.23	5.00	0.00	0.05	0.05
46.70	0.29	0.23	5.00	0.00	0.04	0.04
46.75	0.29	0.23	5.00	0.00	0.04	0.04
46.80	0.29	0.23	5.00	0.00	0.04	0.04
46.85	0.29	0.23	5.00	0.00	0.04	0.04
46.90	0.29	0.23	5.00	0.00	0.04	0.04
46.95	0.29	0.23	5.00	0.00	0.04	0.04
47.00	0.29	0.23	5.00	0.00	0.04	0.04
47.05	0.29	0.23	5.00	0.00	0.04	0.04
47.10	0.29	0.23	5.00	0.00	0.04	0.04
47.15	0.29	0.23	5.00	0.00	0.04	0.04
47.20	0.29	0.23	5.00	0.00	0.04	0.04
47.25	0.29	0.23	5.00	0.00	0.04	0.04
47.30	0.29	0.23	5.00	0.00	0.04	0.04
47.35	0.29	0.23	5.00	0.00	0.04	0.04
47.40	0.29	0.23	5.00	0.00	0.04	0.04
47.45	0.29	0.23	5.00	0.00	0.03	0.03
47.50	0.29	0.23	5.00	0.00	0.03	0.03
47.55	0.29	0.23	5.00	0.00	0.03	0.03
47.60	0.29	0.23	5.00	0.00	0.03	0.03
47.65	0.29	0.23	5.00	0.00	0.03	0.03
47.70	0.29	0.23	5.00	0.00	0.03	0.03
47.75	0.29	0.23	5.00	0.00	0.03	0.03
47.80	0.29	0.23	5.00	0.00	0.03	0.03
47.85	0.29	0.23	5.00	0.00	0.03	0.03
47.90	0.29	0.23	5.00	0.00	0.03	0.03
47.95	0.29	0.23	5.00	0.00	0.03	0.03
48.00	0.29	0.23	5.00	0.00	0.03	0.03
48.05	0.29	0.23	5.00	0.00	0.03	0.03
48.10	0.29	0.23	5.00	0.00	0.03	0.03
48.15	0.29	0.23	5.00	0.00	0.03	0.03
48.20	0.29	0.23	5.00	0.00	0.02	0.02
48.25	0.29	0.23	5.00	0.00	0.02	0.02
48.30	0.29	0.23	5.00	0.00	0.02	0.02
48.35	0.29	0.23	5.00	0.00	0.02	0.02
48.40	0.29	0.23	5.00	0.00	0.02	0.02
48.45	0.29	0.23	5.00	0.00	0.02	0.02
48.50	0.29	0.23	5.00	0.00	0.02	0.02
48.55	0.29	0.23	5.00	0.00	0.02	0.02
48.60	0.29	0.23	5.00	0.00	0.02	0.02
48.65	0.29	0.23	5.00	0.00	0.02	0.02
48.70	0.29	0.23	5.00	0.00	0.02	0.02
48.75	0.29	0.23	5.00	0.00	0.02	0.02
48.80	0.29	0.23	5.00	0.00	0.02	0.02
48.85	0.29	0.23	5.00	0.00	0.02	0.02
48.90	0.29	0.23	5.00	0.00	0.02	0.02
48.95	0.29	0.23	5.00	0.00	0.01	0.01
49.00	0.28	0.23	5.00	0.00	0.01	0.01
49.05	0.28	0.23	5.00	0.00	0.01	0.01
49.10	0.28	0.23	5.00	0.00	0.01	0.01

49.15	0.28	0.23	5.00	0.00	0.01	0.01
49.20	0.28	0.23	5.00	0.00	0.01	0.01
49.25	0.28	0.23	5.00	0.00	0.01	0.01
49.30	0.28	0.23	5.00	0.00	0.01	0.01
49.35	0.28	0.23	5.00	0.00	0.01	0.01
49.40	0.28	0.23	5.00	0.00	0.01	0.01
49.45	0.28	0.22	5.00	0.00	0.01	0.01
49.50	0.28	0.22	5.00	0.00	0.01	0.01
49.55	0.28	0.22	5.00	0.00	0.01	0.01
49.60	0.28	0.22	5.00	0.00	0.01	0.01
49.65	0.28	0.22	5.00	0.00	0.00	0.00
49.70	0.28	0.22	5.00	0.00	0.00	0.00
49.75	0.28	0.22	5.00	0.00	0.00	0.00
49.80	0.28	0.22	5.00	0.00	0.00	0.00
49.85	0.28	0.22	5.00	0.00	0.00	0.00
49.90	0.28	0.22	5.00	0.00	0.00	0.00
49.95	0.28	0.22	5.00	0.00	0.00	0.00
50.00	0.28	0.22	5.00	0.00	0.00	0.00

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* F.S.<1, Liquefaction Potential Zone
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

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1 atm (atmosphere) = 1 tsf (ton/ft2)
CRRm Cyclic resistance ratio from soils
CSRsf Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S. Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat Settlement from saturated sands
S_dry Settlement from Unsaturated Sands
S_all Total Settlement from Saturated and Unsaturated Sands
NoLiq No-Liquefy Soils

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*                        *
*    E Q S E A R C H     *
*                        *
*     Version 3.00       *
*                        *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 01223205

DATE: 11-02-2023

JOB NAME: 01223205

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
   MINIMUM MAGNITUDE: 4.00
   MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
   SITE LATITUDE: 36.0217
   SITE LONGITUDE: 119.0316

SEARCH DATES:
           START DATE: 1800
           END DATE: 2021

SEARCH RADIUS:
           50.0 mi
           80.5 km

ATTENUATION RELATION: 3) Boore et al. (1997) Horiz. - NEHRP D (250)
   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: Campbell SHR:
   COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 0.0

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	36.0900	118.8700	02/11/1948	32928.3	11.7	4.60	0.088	VII	10.2(16.4)
DMG	36.0800	118.8300	05/29/1915	830 0.0	0.0	4.50	0.074	VII	11.9(19.2)
DMG	36.0800	118.8200	05/29/1915	646 0.0	0.0	5.00	0.094	VII	12.5(20.1)
T-A	36.1700	119.3200	07/25/1868	230 0.0	0.0	5.00	0.068	VI	19.1(30.7)
DMG	35.8000	118.5330	07/26/1932	65158.3	0.0	4.50	0.036	V	31.8(51.2)
DMG	35.6000	118.8000	06/30/1926	1331 0.0	0.0	5.00	0.046	VI	31.9(51.3)
PAS	35.7550	118.5420	04/17/1975	91833.8	9.6	4.00	0.027	V	33.0(53.1)
GSG	35.9280	118.4280	07/13/1992	095305.9	5.0	4.00	0.026	V	34.3(55.3)
DMG	35.5000	118.9670	09/29/1948	4 648.0	0.0	4.20	0.028	V	36.2(58.3)
GSP	35.7310	118.4790	07/11/1999	182046.8	4.0	4.40	0.030	V	36.9(59.3)
GSB	35.9960	118.3690	09/06/1993	103233.0	9.0	4.00	0.024	V	37.0(59.6)
DMG	35.7500	119.6170	04/15/1950	115632.0	0.0	4.60	0.033	V	37.7(60.7)
DMG	36.2000	118.3830	05/18/1945	94440.0	0.0	4.00	0.024	IV	38.2(61.5)
GSP	35.5423	119.3728	02/24/2016	000223.6	22.1	4.87	0.038	V	38.2(61.5)
PAS	35.9300	118.3410	10/19/1983	14 037.2	1.5	4.00	0.023	IV	39.1(62.9)
PAS	35.9260	118.3340	10/21/1983	224413.3	0.0	4.50	0.030	V	39.5(63.6)
PAS	35.4520	118.8990	02/08/1985	65816.9	11.1	4.60	0.031	V	40.0(64.4)
DMG	35.5000	118.7000	01/06/1905	1430 0.0	0.0	5.00	0.038	V	40.5(65.2)
GSP	35.6800	118.4300	11/11/1991	045327.0	4.0	4.00	0.022	IV	41.1(66.2)
DMG	35.4500	119.2500	01/23/1935	1352 0.0	0.0	4.00	0.022	IV	41.3(66.5)
DMG	35.6670	118.4040	03/08/1971	23 8 7.7	5.9	4.10	0.023	IV	42.8(68.9)
DMG	36.2600	118.3100	10/03/1969	233227.1	0.2	4.00	0.021	IV	43.5(69.9)
DMG	35.4650	118.6680	02/07/1964	221052.0	-0.5	4.20	0.024	IV	43.5(70.0)
DMG	35.6590	118.3780	03/03/1971	12 516.0	4.1	4.00	0.021	IV	44.3(71.3)
DMG	35.4170	119.3000	06/04/1941	84719.0	0.0	4.00	0.021	IV	44.4(71.4)
DMG	36.6020	119.3750	09/15/1973	1 315.4	8.0	4.40	0.026	V	44.4(71.4)
DMG	35.4000	118.8170	07/29/1952	8 146.0	0.0	5.10	0.038	V	44.6(71.7)
DMG	35.4330	118.7000	05/01/1954	22 439.0	0.0	4.20	0.023	IV	44.7(71.9)
DMG	35.3830	118.8500	10/13/1952	222035.0	0.0	4.00	0.021	IV	45.3(72.8)
DMG	35.3830	118.8500	07/29/1952	7 347.0	0.0	6.10	0.063	VI	45.3(72.8)
GSB	35.8113	119.8008	12/13/2013	074957.4	22.2	4.10	0.022	IV	45.4(73.1)
DMG	35.4320	118.6640	09/30/1964	175125.8	7.4	4.00	0.021	IV	45.6(73.4)
DMG	35.4540	118.6050	02/07/1964	22 750.3	-2.0	4.40	0.025	V	45.9(73.9)
DMG	35.3670	118.8830	09/12/1953	64116.0	0.0	4.10	0.022	IV	46.0(74.0)
GSP	35.3700	118.8500	12/18/1990	165643.0	6.0	4.20	0.023	IV	46.1(74.2)
DMG	35.6470	118.3450	06/05/1946	215932.4	0.0	4.30	0.024	V	46.3(74.5)
DMG	35.3500	118.9670	02/04/1954	204841.0	0.0	4.00	0.020	IV	46.5(74.9)
DMG	35.3670	118.8330	03/17/1935	2026 0.0	0.0	4.00	0.020	IV	46.6(74.9)
DMG	35.5000	118.5000	07/27/1952	24912.0	0.0	4.00	0.020	IV	46.7(75.2)
PAS	35.3720	118.7740	12/15/1987	182346.1	3.2	4.10	0.021	IV	47.1(75.8)
T-A	35.3300	119.0000	01/04/1870	7 0 0.0	0.0	4.30	0.023	IV	47.8(76.9)
GSP	35.4663	118.5210	04/19/2014	121513.0	-0.8	4.24	0.023	IV	47.8(77.0)
DMG	35.3330	118.9170	07/31/1952	195314.0	0.0	4.50	0.026	V	48.0(77.2)
DMG	35.3330	118.9170	08/22/1952	224124.0	0.0	5.80	0.051	VI	48.0(77.2)
DMG	35.3330	118.9170	08/07/1952	1919 7.0	0.0	4.20	0.022	IV	48.0(77.2)
DMG	35.3330	118.9170	07/29/1952	195132.0	0.0	4.50	0.026	V	48.0(77.2)
DMG	36.0000	118.1670	02/26/1933	655 0.0	0.0	4.00	0.020	IV	48.3(77.7)
DMG	35.4000	118.6330	10/02/1952	231021.0	0.0	4.20	0.022	IV	48.4(77.9)
DMG	35.6870	118.2630	05/03/1936	1421 1.8	10.0	4.00	0.020	IV	48.8(78.6)
DMG	35.3790	118.6680	11/21/1955	205527.6	5.3	4.30	0.023	IV	48.8(78.6)
DMG	35.3170	118.9500	09/01/1952	1039 0.0	0.0	4.10	0.021	IV	48.9(78.6)
DMG	35.7330	118.2330	07/10/1943	31233.0	0.0	4.00	0.020	IV	48.9(78.7)
DMG	35.7890	118.2040	04/16/1946	1037 4.7	0.0	4.10	0.021	IV	49.0(78.8)

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]
DMG	35.3950	118.6200	08/08/1955	32150.5	4.1	4.70	0.028	V	49.0(78.9)
DMG	35.3330	119.2500	01/20/1941	135816.0	0.0	4.00	0.020	IV	49.1(79.0)
GSP	35.3900	118.6230	09/29/2004	225454.2	3.0	5.00	0.033	V	49.3(79.3)
GSB	36.0030	119.9160	09/16/1992	061433.4	11.0	4.30	0.023	IV	49.4(79.5)
DMG	35.4000	118.5830	07/25/1952	7 351.0	0.0	4.10	0.020	IV	49.7(80.1)
DMG	35.4000	118.5830	07/24/1952	114756.0	0.0	4.40	0.024	IV	49.7(80.1)
MGI	35.3000	119.0000	09/04/1908	0 0 0.0	0.0	4.60	0.027	V	49.9(80.2)
MGI	35.3000	119.0000	01/08/1903	030 0.0	0.0	4.60	0.027	V	49.9(80.2)
DMG	35.9170	119.9170	07/14/1947	540 6.0	0.0	4.00	0.019	IV	50.0(80.5)

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-END OF SEARCH- 62 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2021

LENGTH OF SEARCH TIME: 222 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 10.2 MILES (16.4 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 6.1

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.094 g

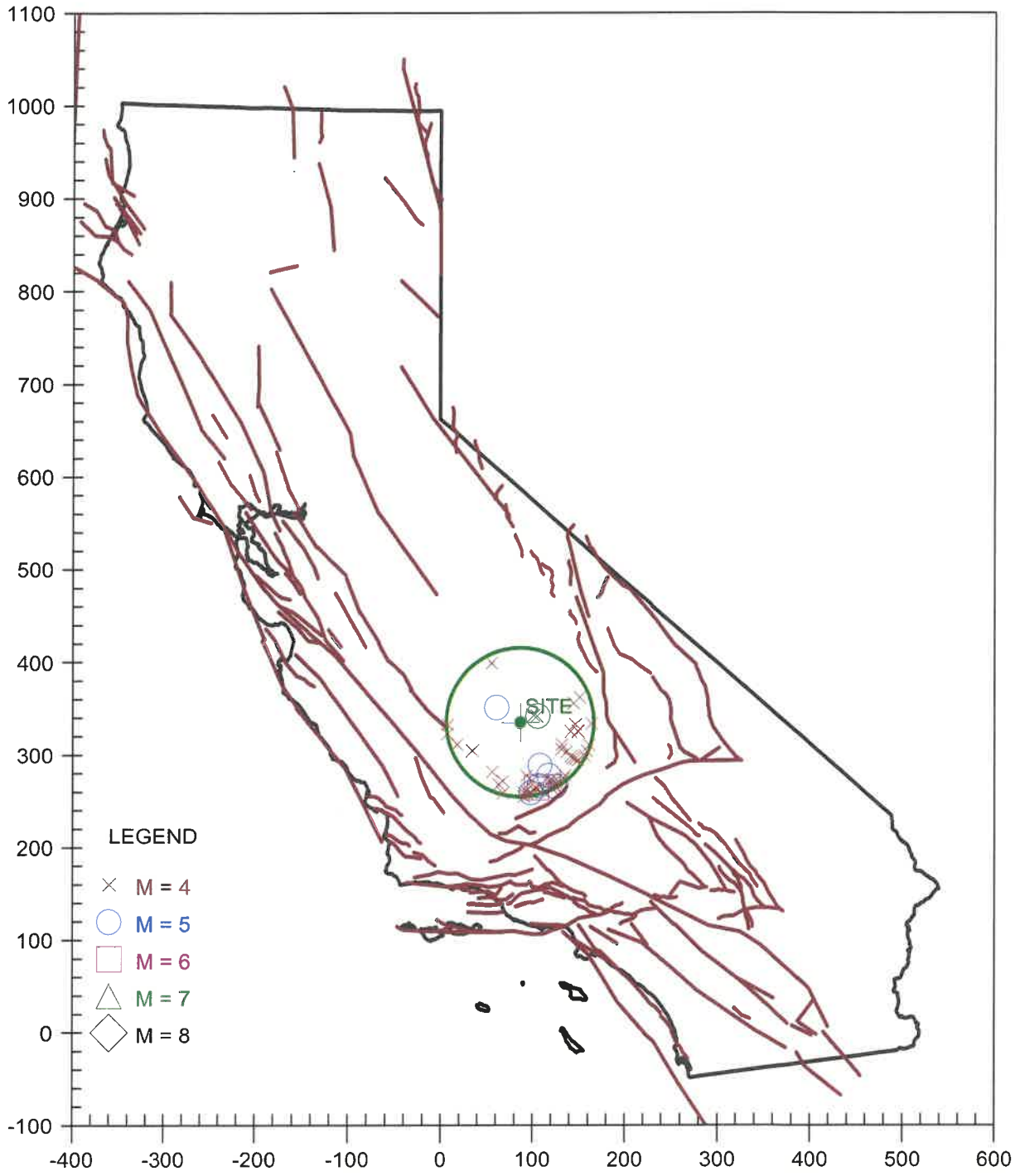
COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 3.098
b-value= 0.917
beta-value= 2.111

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	62	0.28054
4.5	20	0.09050
5.0	8	0.03620
5.5	2	0.00905
6.0	1	0.00452

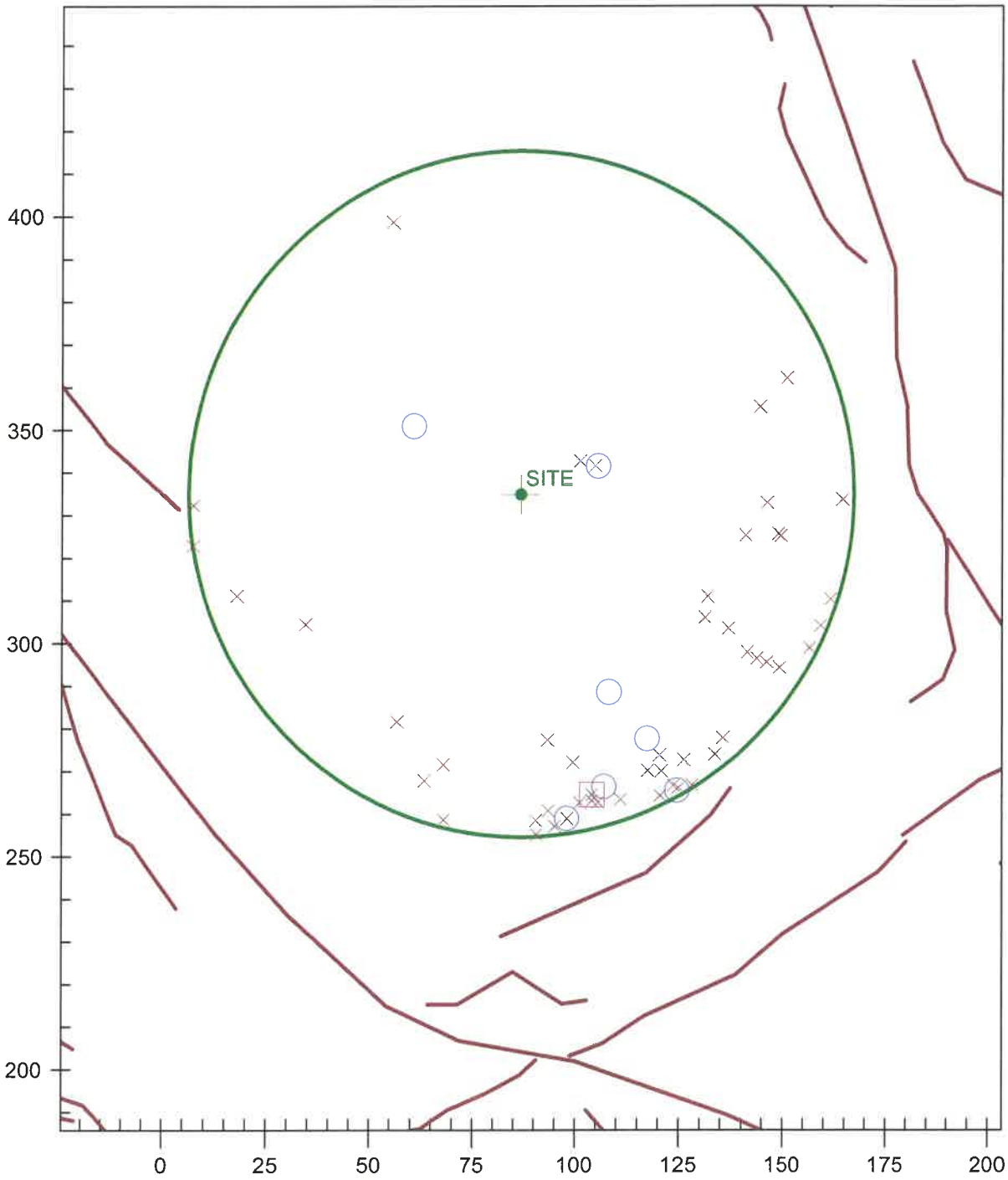
EARTHQUAKE EPICENTER MAP

01223205



EARTHQUAKE EPICENTER MAP

01223205



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*    E Q S E A R C H     *
*                        *
*     Version 3.00       *
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ESTIMATION OF
PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 01223205

DATE: 11-02-2023

JOB NAME: 01223205

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT

MAGNITUDE RANGE:
   MINIMUM MAGNITUDE: 5.00
   MAXIMUM MAGNITUDE: 9.00

SITE COORDINATES:
   SITE LATITUDE: 36.0217
   SITE LONGITUDE: 119.0316

SEARCH DATES:
           START DATE: 1800
           END DATE: 2021

SEARCH RADIUS:
           100.0 mi
           160.9 km

ATTENUATION RELATION: 3) Boore et al. (1997) Horiz. - NEHRP D (250)
   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: Campbell SHR:
   COMPUTE PEAK HORIZONTAL ACCELERATION

MINIMUM DEPTH VALUE (km): 0.0

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	36.0800	118.8200	05/29/1915	646 0.0	0.0	5.00	0.094	VII	12.5(20.1)
T-A	36.1700	119.3200	07/25/1868	230 0.0	0.0	5.00	0.068	VI	19.1(30.7)
DMG	35.6000	118.8000	06/30/1926	1331 0.0	0.0	5.00	0.046	VI	31.9(51.3)
DMG	35.5000	118.7000	01/06/1905	1430 0.0	0.0	5.00	0.038	V	40.5(65.2)
DMG	35.4000	118.8170	07/29/1952	8 146.0	0.0	5.10	0.038	V	44.6(71.7)
DMG	35.3830	118.8500	07/29/1952	7 347.0	0.0	6.10	0.063	VI	45.3(72.8)
DMG	35.3330	118.9170	08/22/1952	224124.0	0.0	5.80	0.051	VI	48.0(77.2)
GSP	35.3900	118.6230	09/29/2004	225454.2	3.0	5.00	0.033	V	49.3(79.3)
DMG	35.3000	118.8000	12/23/1905	2223 0.0	0.0	5.00	0.032	V	51.5(82.9)
DMG	35.3670	118.5830	07/23/1952	31923.0	0.0	5.00	0.032	V	51.7(83.2)
DMG	35.3670	118.5830	07/23/1952	03832.0	0.0	6.10	0.057	VI	51.7(83.2)
MGI	36.6000	118.4000	09/04/1868	0 0 0.0	0.0	5.00	0.031	V	53.2(85.6)
DMG	35.3330	118.6000	07/31/1952	12 9 9.0	0.0	5.80	0.047	VI	53.4(85.9)
DMG	35.3150	118.5160	07/25/1952	194323.7	11.2	5.70	0.043	VI	56.7(91.3)
DMG	35.2170	118.8170	07/23/1952	1317 5.0	0.0	5.70	0.043	VI	56.8(91.5)
DMG	35.3170	118.4940	07/25/1952	19 944.6	5.5	5.70	0.043	VI	57.2(92.1)
DMG	35.3110	118.4990	07/25/1952	1313 8.2	2.8	5.00	0.029	V	57.4(92.4)
PAS	36.1510	120.0490	08/04/1985	12 156.0	6.0	5.80	0.045	VI	57.5(92.5)
DMG	35.7780	118.0490	01/28/1961	81246.2	5.5	5.30	0.034	V	57.5(92.5)
DMG	35.7150	118.0740	03/15/1946	14 035.4	0.0	5.30	0.034	V	57.6(92.7)
DMG	35.7250	118.0550	03/15/1946	134935.9	22.0	6.30	0.057	VI	58.3(93.9)
DMG	35.7450	118.0390	03/16/1946	94617.9	0.0	5.10	0.030	V	58.7(94.5)
DMG	35.7510	118.0290	03/15/1946	215433.4	0.0	5.20	0.032	V	59.1(95.1)
GSP	35.1490	119.1040	05/28/1993	044740.6	21.0	5.20	0.031	V	60.4(97.2)
DMG	35.2330	118.5330	07/21/1952	174244.0	0.0	5.10	0.029	V	61.2(98.5)
DMG	35.7530	117.9860	03/15/1946	1321 0.9	0.0	5.20	0.031	V	61.4(98.7)
DMG	35.1830	118.6500	07/21/1952	151358.0	0.0	5.10	0.029	V	61.7(99.4)
DMG	36.7000	118.3000	08/17/1896	1130 0.0	0.0	5.90	0.044	VI	62.0(99.8)
DMG	35.7140	117.9770	03/15/1946	191853.6	0.0	5.40	0.034	V	62.7(100.9)
DMG	36.4000	118.0000	07/05/1871	21 6 0.0	0.0	5.20	0.030	V	63.1(101.6)
DMG	35.1330	118.7670	07/21/1952	194122.0	0.0	5.50	0.035	V	63.1(101.6)
DMG	35.1500	118.6330	01/27/1954	141948.0	0.0	5.00	0.027	V	64.2(103.3)
MGI	36.6000	118.1000	05/17/1872	21 0 0.0	0.0	5.00	0.027	V	65.4(105.3)
MGI	36.5800	118.0800	07/06/1917	11 1 0.0	0.0	5.70	0.038	V	65.5(105.4)
DMG	35.7470	117.9080	03/18/1946	155042.6	4.4	5.30	0.031	V	65.6(105.6)
DMG	35.3000	119.8000	01/09/1857	16 0 0.0	0.0	7.90	0.122	VII	65.9(106.0)
T-A	36.5800	118.0700	04/18/1872	0 0 0.0	0.0	5.00	0.026	V	65.9(106.1)
T-A	36.5800	118.0700	08/13/1882	0 0 0.0	0.0	5.00	0.026	V	65.9(106.1)
DMG	36.7000	118.1000	03/26/1872	1030 0.0	0.0	7.80	0.110	VII	69.8(112.4)
PAS	36.1820	120.2680	02/14/1987	72650.8	6.0	5.10	0.027	V	69.9(112.4)
BRK	36.2200	120.2600	09/09/1983	91614.0	0.0	5.40	0.031	V	69.9(112.4)
GSP	36.3910	117.8610	10/03/2009	011600.3	0.0	5.20	0.028	V	70.0(112.7)
GSP	36.3880	117.8580	10/01/2009	100124.7	5.0	5.00	0.025	V	70.1(112.8)
DMG	35.0000	119.0330	07/21/1952	12 2 0.0	0.0	5.60	0.034	V	70.5(113.5)
DMG	35.0000	119.0170	01/12/1954	233349.0	0.0	5.90	0.040	V	70.5(113.5)
DMG	35.0000	119.0170	07/21/1952	115214.0	0.0	7.70	0.104	VII	70.5(113.5)
DMG	35.0000	119.0000	07/21/1952	12 531.0	0.0	6.40	0.052	VI	70.6(113.6)
DMG	35.0000	119.0000	02/16/1919	1557 0.0	0.0	5.00	0.025	V	70.6(113.6)
DMG	35.7500	120.2500	03/10/1922	112120.0	0.0	6.50	0.055	VI	70.7(113.8)
DMG	35.0000	118.8330	07/23/1952	75319.0	0.0	5.40	0.031	V	71.4(114.9)
DMG	35.0000	118.8330	07/23/1952	181351.0	0.0	5.20	0.028	V	71.4(114.9)
BRK	36.2200	120.2900	05/02/1983	2346 6.0	0.0	5.60	0.034	V	71.5(115.1)
BRK	36.2200	120.2900	05/02/1983	234239.0	0.0	6.70	0.061	VI	71.5(115.1)

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]
DMG	34.9830	118.9830	05/23/1954	235243.0	0.0	5.10	0.026	V	71.8(115.5)
BRK	36.2400	120.2900	05/09/1983	24912.0	0.0	5.20	0.027	V	71.8(115.5)
DMG	35.8310	117.7610	10/19/1961	5 943.9	-2.0	5.20	0.027	V	72.2(116.3)
DMG	36.1700	120.3200	12/27/1926	919 0.0	0.0	5.00	0.024	V	72.6(116.8)
T-A	36.8300	118.1700	02/28/1895	825 0.0	0.0	5.00	0.024	V	73.5(118.3)
T-A	36.8300	118.1700	07/12/1871	330 0.0	0.0	5.00	0.024	V	73.5(118.3)
DMG	35.8000	120.3300	06/08/1934	430 0.0	0.0	5.00	0.024	V	74.2(119.4)
DMG	35.8000	120.3300	12/28/1939	121538.0	0.0	5.00	0.024	V	74.2(119.4)
DMG	35.8000	120.3300	06/08/1934	447 0.0	0.0	6.00	0.041	V	74.2(119.4)
DMG	35.8000	120.3300	06/05/1934	2148 0.0	0.0	5.00	0.024	V	74.2(119.4)
DMG	34.9500	118.8670	07/21/1952	121936.0	0.0	5.30	0.028	V	74.6(120.0)
DMG	34.9410	118.9870	11/15/1961	53855.5	10.7	5.00	0.024	V	74.7(120.1)
DMG	35.7500	120.3300	08/18/1922	512 0.0	0.0	5.00	0.024	IV	75.0(120.7)
DMG	34.9320	118.9760	03/01/1963	02557.9	13.9	5.00	0.024	IV	75.3(121.2)
GSB	35.8190	120.3640	09/28/2004	171524.2	8.0	6.00	0.040	V	75.8(122.0)
DMG	36.9000	118.2000	03/26/1872	14 6 0.0	0.0	6.50	0.052	VI	76.2(122.7)
PAS	34.9430	118.7430	06/10/1988	23 643.0	6.8	5.40	0.029	V	76.2(122.7)
BRK	36.2100	120.3800	07/25/1983	223140.0	0.0	5.10	0.025	V	76.3(122.8)
T-A	34.9200	118.9200	01/20/1857	0 0 0.0	0.0	5.00	0.024	IV	76.3(122.8)
T-A	34.9200	118.9200	05/23/1857	0 0 0.0	0.0	5.00	0.024	IV	76.3(122.8)
DMG	36.9000	118.1900	11/28/1929	1949 0.0	0.0	5.50	0.031	V	76.6(123.2)
GSP	36.0750	117.6500	11/27/1996	201724.1	1.0	5.30	0.027	V	77.2(124.3)
BRK	36.2000	120.4000	07/22/1983	343 2.0	0.0	5.00	0.023	IV	77.3(124.4)
BRK	36.2200	120.4000	07/22/1983	23955.0	0.0	6.00	0.039	V	77.5(124.8)
DMG	34.9000	118.9500	08/01/1952	13 430.0	0.0	5.10	0.024	V	77.6(124.8)
DMG	34.9000	118.9000	10/23/1916	244 0.0	0.0	6.00	0.039	V	77.8(125.2)
GSP	36.0670	117.6380	03/06/1998	054740.3	1.0	5.20	0.026	V	77.9(125.3)
GSP	35.2100	118.0660	07/11/1992	181416.2	10.0	5.70	0.033	V	78.0(125.5)
BRK	36.2600	120.4000	07/09/1983	74052.0	0.0	5.30	0.027	V	78.0(125.6)
GSP	35.7760	117.6620	08/17/1995	223959.0	5.0	5.40	0.028	V	78.5(126.3)
GSP	36.0760	117.6180	03/07/1998	003646.8	1.0	5.00	0.023	IV	79.0(127.1)
PAS	36.2860	120.4130	10/25/1982	2226 4.0	6.0	5.60	0.031	V	79.1(127.4)
GSP	35.7660	117.6490	01/07/1996	143253.1	5.0	5.20	0.025	V	79.3(127.6)
DMG	34.8670	118.9330	09/21/1941	1953 7.2	0.0	5.20	0.025	V	79.9(128.6)
GSB	35.7610	117.6390	09/20/1995	232736.3	5.0	6.10	0.041	V	79.9(128.7)
GSB	35.9170	120.4650	12/20/1994	102747.2	8.0	5.00	0.023	IV	80.4(129.4)
DMG	35.9500	120.4700	11/16/1956	323 9.0	0.0	5.00	0.023	IV	80.5(129.6)
DMG	35.9300	120.4800	12/24/1934	1626 0.0	0.0	5.00	0.022	IV	81.2(130.6)
BRK	36.2500	120.4700	06/11/1983	3 954.0	0.0	5.10	0.024	IV	81.7(131.5)
DMG	37.0000	118.2000	04/03/1872	1215 0.0	0.0	6.10	0.040	V	81.8(131.6)
DMG	36.0000	120.5000	03/03/1901	745 0.0	0.0	5.50	0.029	V	82.0(132.0)
DMG	36.0000	120.5000	02/02/1881	011 0.0	0.0	5.60	0.031	V	82.0(132.0)
DMG	35.9700	120.5000	06/28/1966	4 856.2	0.0	5.10	0.023	IV	82.1(132.1)
DMG	35.9500	120.5000	06/28/1966	42613.4	0.0	5.50	0.029	V	82.2(132.3)
GSB	35.9530	120.5020	09/29/2004	171004.0	11.0	5.10	0.023	IV	82.3(132.4)
MGI	37.0000	118.1700	12/02/1929	7 0 0.0	0.0	5.30	0.026	V	82.8(133.2)
MGI	37.0000	118.1700	12/08/1929	1245 0.0	0.0	5.30	0.026	V	82.8(133.2)
DMG	37.2000	118.7000	09/30/1889	520 0.0	0.0	5.60	0.030	V	83.4(134.2)
T-A	34.8300	118.7500	11/27/1852	0 0 0.0	0.0	7.00	0.063	VI	83.8(134.8)
DMG	35.9500	120.5300	06/29/1966	195325.9	0.0	5.00	0.022	IV	83.9(134.9)
DMG	34.8000	119.1000	09/05/1883	1230 0.0	0.0	6.00	0.037	V	84.4(135.9)
DMG	35.6310	117.5130	09/17/1938	1423 4.1	-2.0	5.00	0.021	IV	89.2(143.5)
DMG	34.7000	119.0000	10/23/1916	254 0.0	0.0	5.50	0.027	V	91.3(146.9)

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]
DMG	36.2300	120.6500	02/05/1947	614 0.0	0.0	5.00	0.020	IV	91.4(147.1)
MGI	35.5000	120.6000	01/01/1830	0 0 0.0	0.0	5.00	0.020	IV	95.0(152.8)
DMG	37.3500	118.5500	08/04/1959	73659.0	0.0	5.20	0.022	IV	95.5(153.7)
DMG	37.3300	118.4200	01/05/1912	354 0.0	0.0	5.50	0.026	V	96.5(155.2)
DMG	37.3300	118.4200	05/06/1910	1640 0.0	0.0	5.50	0.026	V	96.5(155.2)
MGI	35.2500	120.5000	07/10/1917	045 0.0	0.0	5.30	0.023	IV	98.1(157.9)
MGI	35.2500	120.5000	07/10/1917	043 0.0	0.0	5.30	0.023	IV	98.1(157.9)
MGI	35.2500	120.5000	07/09/1917	2222 0.0	0.0	5.00	0.019	IV	98.1(157.9)
MGI	35.2500	120.5000	07/09/1917	2238 0.0	0.0	5.30	0.023	IV	98.1(157.9)
DMG	37.4170	118.6670	02/02/1961	0 742.0	0.0	5.10	0.020	IV	98.4(158.4)
PAS	37.4230	118.6080	11/23/1984	191235.3	6.0	5.40	0.024	IV	99.5(160.2)

****

-END OF SEARCH- 117 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1800 TO 2021

LENGTH OF SEARCH TIME: 222 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 12.5 MILES (20.1 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 7.9

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.122 g

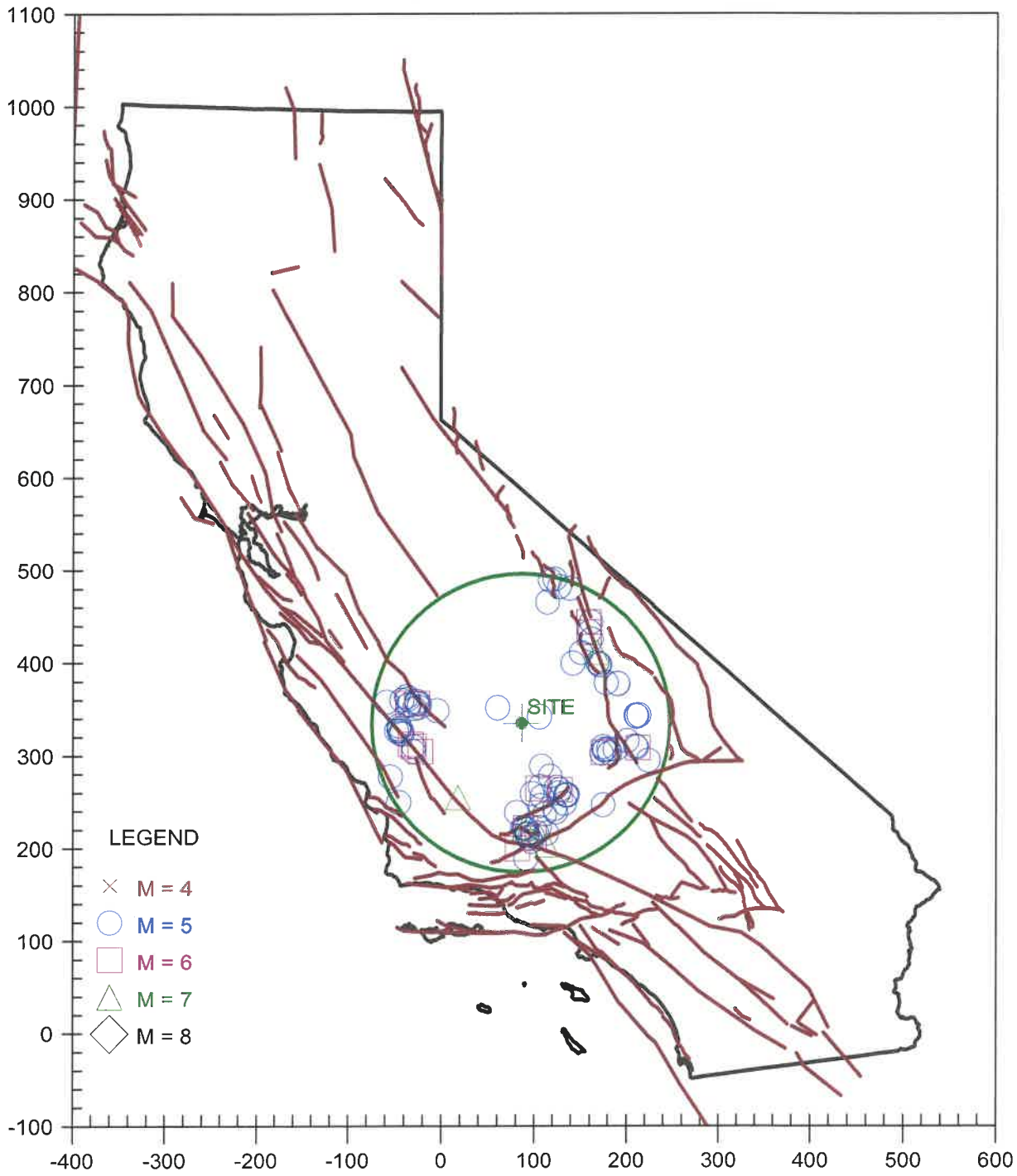
COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 1.558
b-value= 0.418
beta-value= 0.963

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	117	0.52941
4.5	117	0.52941
5.0	117	0.52941
5.5	40	0.18100
6.0	18	0.08145
6.5	7	0.03167
7.0	4	0.01810
7.5	3	0.01357

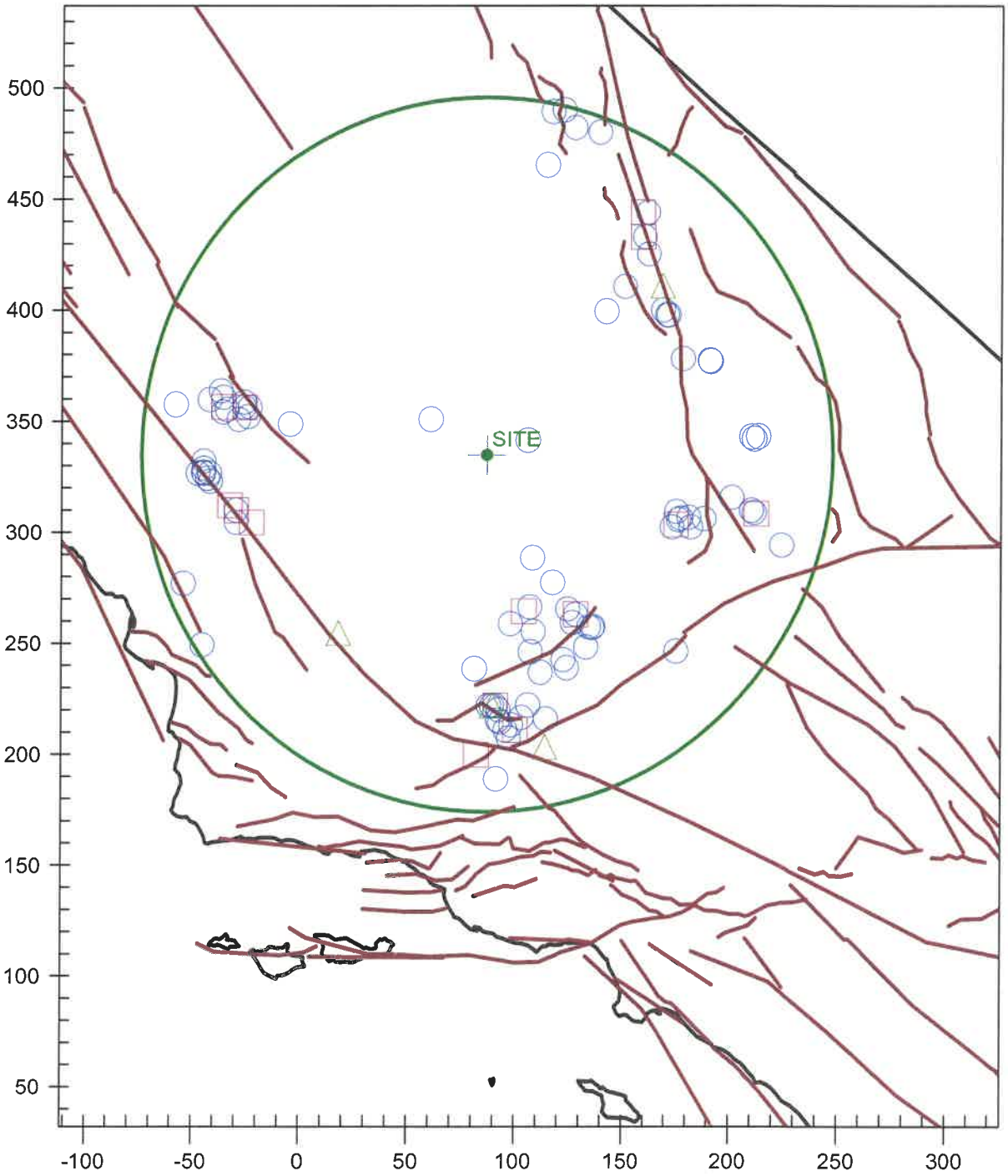
EARTHQUAKE EPICENTER MAP

01223205



EARTHQUAKE EPICENTER MAP

01223205



APPENDIX E

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