Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

GEOTECHNICAL STUDY REPORT (FINAL)
Proposed Athletic Complex East
Mount San Antonio College
Walnut, California

Converse Project No. 14-31-124-01

January 23, 2015

Prepared For:

Mount San Antonio College
1100 North Grand Avenue, Building No. 23
Walnut, California 91789

Prepared By:

Converse Consultants
222 East Huntington Drive, Suite 211
Monrovia, California 91016

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

January 23, 2015

Mr. Leonard Ortiz
Construction Specialist
Mount San Antonio College
Facilities Planning & Management
1100 North Grand Avenue, Building 23
Walnut, California 91789

Subject: **GEOTECHNICAL STUDY REPORT (FINAL)**
Proposed Athletic Complex East
Mount San Antonio College
Walnut, California
Converse Project No. 14-31-124-01

Dear Mr. Ortiz:

Converse Consultants (Converse) has prepared this geotechnical study report to present the findings, conclusions and recommendations of our geologic and geotechnical study for the Proposed Athletics Complex East Project at Mount San Antonio College, Walnut, California.

In accordance with California Education Code, Sections 17212 and 81033, this report was prepared consistent with the current edition of California Building Code, Title 24, Chapter 16A and Chapter 18A; California Administrative Code, Part 1, Title 24, CCR, Section 4-317 (e) and CGS Note 48-Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals and Essential Services Buildings, for design and for the Division of the State Architect (DSA) submittal purposes.

Converse evaluated the nature and engineering properties of the subsurface soils and bedrock to provide recommendations for site earthwork, foundation design and construction for the proposed development. Our services were performed in accordance with our proposal dated February 25, 2014.

We appreciate the opportunity to be of continued service to Mount San Antonio College. If you should have any questions, please do not hesitate to contact us at (626) 930-1200.

CONVERSE CONSULTANTS

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
Vice President/Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
KATHIRAVETPILLAI SIVATHASAN
No. 2708
Exp 6-30-16
GEOTECHNICAL
STATE OF CALIFORNIA

Dist: 5/Addressee

MM/SKS/MBS/WHC/jjl

222 East Huntington Drive, Suite 211, Monrovia, California 91016-3500
Telephone: (626) 930-1200 ♦ Facsimile: (626) 930-1212 ♦ e-mail: converse@converseconsultants.com

PROFESSIONAL CERTIFICATION

This report for the Proposed Athletics Complex East Project located within the campus of Mount San Antonio College, in the City of Walnut, California, has been prepared by the staff of Converse under the professional supervision of the individuals whose seals and signatures appear hereon.

The findings, recommendations, specifications or professional opinions contained in this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice in this area of Southern California. There is no warranty, either expressed or implied.

In the event that changes to the property occur, or additional, relevant information about the property is brought to our attention, the conclusions contained in this report may not be valid unless these changes and additional relevant information are reviewed and the recommendations of this report are modified or verified in writing.

Mohammad Malim, EIT
Senior Staff Engineer

Mark B. Schluter, PG, CEG
Senior Engineering Geologist

Siva K. Sivathasan, PhD, PE, GE, DGE, QSD, F. ASCE
Vice President/Principal Engineer

EXECUTIVE SUMMARY

The following is a summary of our geotechnical study, conclusions and recommendations, as presented in the body of this report, please refer to the appropriate sections of the report for complete conclusions and recommendations. In the event of a conflict between this summary and the report, or an omission in the summary, the report shall prevail.

- The proposed developments for the Athletic Complex East consist of construction of several multi-level buildings that will have the following footprints as summarized in the Table No. 1, *Planned Buildings and Building Footprints*. In addition, visitor bleachers to accommodate 4,000 seats, two pedestrian bridges, IAAF Compliant Track and Field, scoreboard, flatwork, access roads and retaining walls will be constructed as part of the project.

- Twenty-nine (29) exploratory borings (BH-1 through BH-29) were drilled within the project sites from June 16 to June 24, 2014. Sixteen (16) borings were also drilled within the project site from April 6 to April 15, 2013 as part of the Geotechnical Study Report for the Fill Placement for the Driving Range and Practice Field and Hilltop Removal for Future Physical Education Complex (2013). The borings were advanced using a limited access track drill rig and a truck-mounted drill rig with an 8-inch diameter hollow stem auger to depths ranging from 10 to 91.5 feet below the existing ground surface (bgs).

- There are no known active faults projecting toward or extending across the proposed site. The project site is not located within a currently designated State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zones) for surface fault rupture.

- The site is partially located within a mapped Seismic Hazard Zone for liquefaction. The results of liquefaction analyses indicate the project site is not susceptible to liquefaction. The estimated potential seismic induced settlement range from approximately 0.67 to 0.87 inches with potential differential settlement ranging from approximately 0.34 to 0.44 inches.

- Local zones of perched groundwater were encountered during subsurface exploration at a depths ranging from approximately 17 to 38 feet bgs in borings BH-1, BH-14, BH-20, BH-21, BH-23, BH-24, BH-25, and BH-26. Localized perched groundwater seepage should be anticipated during excavations.

- Shallow footings or deep foundations are considered suitable for structure support provided the recommendations in this report are incorporated into the project plans, specifications, and are followed during site construction.

- Variable thickness undocumented fill soils were encountered in the borings. The undocumented fill is not considered suitable for any slab or foundation support.

- Based on the proposed plan, cut-and-fill grading operations are required to achieve the planned finished grades.

- The on-site soil has a “Low to High” expansion potential and requires mitigation. On-site clayey soils with an expansion index exceeding 20 should not be re-used for compaction within 2 feet below the proposed foundations or for retaining wall backfill. Soils containing organic materials should not be used as structural fill. The extent of removal should be determined by the geotechnical representative based on soil observation during grading.

- Site soils have “negligible” concentrations of water soluble sulfates.

- In general the pH value, chloride content, and saturated resistivity of the site soils are in the non-corrosive range. However, the saturated resistivity of samples taken, indicate a “Corrosive” potential to ferrous metals.

- The earth materials at the site should be excavatable with conventional heavy-duty earth moving and trenching equipment. The on-site soil materials contain about 5 to 10 percent gravel up to 3 inches in maximum dimension. Larger gravels, cobbles and possible boulders may exist at the site. Earthwork should be performed with suitable equipment for gravelly materials.

Results of our investigation indicate that the site is suitable from a geotechnical standpoint for the proposed development, provided that the recommendations contained in this report are incorporated into the design and construction of the project.

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1.0 INTRODUCTION

This report contains the findings and recommendations of our geotechnical study performed at the site of the proposed Athletics Complex East Project located within the campus of Mount San Antonio College, in the City of Walnut, California, as shown on Drawing No. 1, *Site Location Map*.

The purpose of the investigation was to generate a report for design and the Department of State Architect (DSA) submittal purposes, consistent with current edition of California Education Code, Sections 17212 and 81033, California Building Code, Title 24 CCR, Sections 4-317, 1803 and 1804 and CGS Note 48-Checklist for the review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals and Essential Services Buildings.

We have used site plans provided to us by your office as a reference for this project. The current site plan is included in this report as Drawing No. 2, *Site Plan and Boring Location Map*.

This report is written for the project described herein and is intended for use solely by Mount San Antonio College and its design team. It should not be used as a bidding document but may be made available to the potential contractors for information on factual data only. For bidding purposes, the contractors should be responsible for making their own interpretation of the data contained in this report.

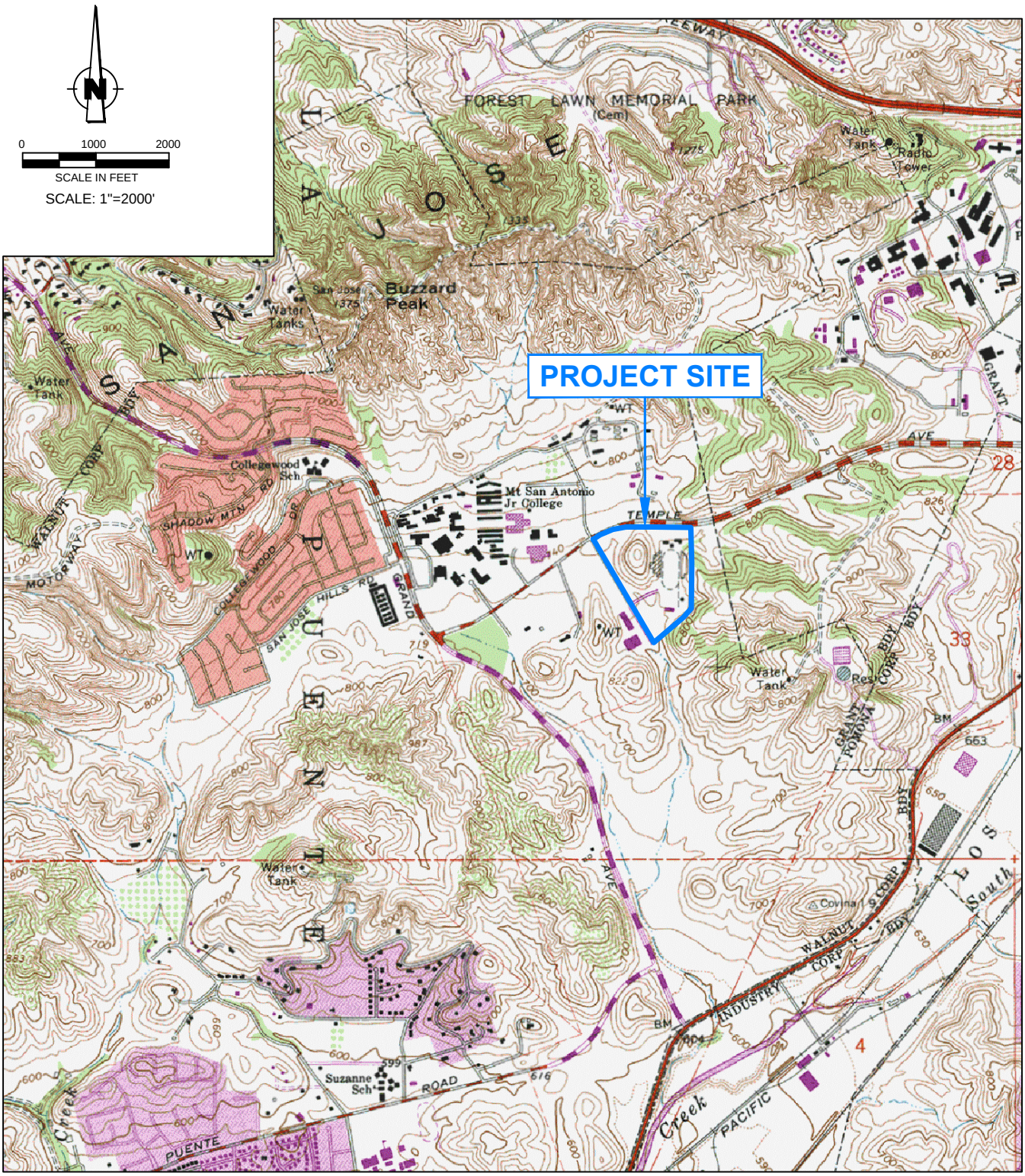
2.0 SITE AND PROJECT DESCRIPTION

2.1 Site Description

The proposed Athletics Complex East is located at the sites of the current Hilmer Lodge Stadium, the adjacent hilltop to the west, and associated athletics practice fields and parking lots in the south-easterly portion of campus in Mt. San Antonio College. The site dimensions are approximately 1300 feet east-west by 1500 feet north-south. The site is bordered by Temple Avenue to the north, a hillside used for cattle grazing to the south and east, the Bonita Drive to the west.

The subject site for the Athletic Complex East has surface elevations ranging from approximately 717 to 784 feet relative to mean-sea-level (MSL), sloping gradually toward the southwest. The site coordinates are: North latitude: 34.0459 degrees, West longitude: 117.8371 degrees.

The site coordinates were centered on the subject sites and used to calculate the earthquake ground motions. Review of the Engineering Geology and Seismology for Public Schools and Hospitals in California, dated August 9, 2005 (page 35) indicates



REFERENCE: USGS MAP
SAN DIMAS QUADRANGLE 1966 PHOTO REVISED 1981

SITE LOCATION MAP

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No.
14-31-124-01

Drawing No.
1

Converse Consultants

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that accuracy to within a few hundred meters of these coordinates is sufficient for the computation of the earthquake ground motion of the project site.

2.2 Project Description

The proposed developments for the Athletic Complex East consist of construction of several multi-level buildings that will have the following footprints as summarized in Table No. 1, *Planned Buildings and Building Footprints*. In addition, visitor bleachers to accommodate 4,000 seats, two pedestrian bridges, IAAF Compliant Track and Field, scoreboard, flatwork, access roads and retaining walls will be constructed as part of the project. The existing stadium structures and athletic facilities will be demolished and removed from the site. Portions of the structures are to be below the existing ground surface.

Table No. 1, Planned Buildings and Building Footprints

Planned Building/Development	Approximate Building Footprint
Field House (including Home Bleachers)	70,000 square feet (7,000 seats)
Gateway Building (buildings for public entry, ticketing, concession and restrooms)	6,500 square feet
New Restroom Building	1,511 square feet
Broadcast Building	251 square feet

The proposed new structural loads are anticipated to be low to moderate and assumed as 200 kips and 10 kips per linear foot for interior columns/posts and interior concrete bearing wall reactions, respectively.

3.0 SCOPE OF WORK

The scope of our work included a site reconnaissance, subsurface exploration with soil sampling, landscape soil sampling and testing, percolation testing, laboratory testing, engineering analysis, and preparation of this report.

3.1 Site Reconnaissance

During the site reconnaissance on March 18, 2014, the surface conditions were noted and the locations of the borings were determined so that drill rig access to all the locations was available. The borings were located using existing boundary features as a guide and should be considered accurate only to the degree implied by the method used. Underground Service Alert (USA) of Southern California was notified of our proposed drilling locations at least 48 hours prior to initiation of the subsurface field work.

3.2 Subsurface Exploration and Percolation Testing

Twenty-nine (29) exploratory borings (BH-1 through BH-29) were drilled within the project sites from June 16 to June 24, 2014. Sixteen (16) borings were also drilled within the project site from April 6 to April 15, 2013 as part of the Geotechnical Study Report for the Fill Placement for the Driving Range and Practice Field and Hilltop Removal for Future Physical Education Complex (2013). The borings were advanced using a limited access track drill rig and a truck-mounted drill rig with an 8-inch diameter hollow stem auger to depths ranging from 10 to 91.5 feet below the existing ground surface (bgs). Each boring was visually logged by a Converse engineer and sampled at regular intervals and at changes in subsurface soils. Detailed descriptions of the field exploration and sampling program are presented in Appendix A, *Field Exploration*.

California Modified Sampler (Ring samples), Standard Penetration Test samples, and bulk soil samples were obtained for laboratory testing. Standard Penetration Tests (SPTs) were performed in selected borings at selected intervals using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The bore holes were backfilled and compacted with soil cuttings by reverse spinning of the auger following the completion of drilling and patched with asphalt where necessary to match existing conditions.

Borings BH-22 and BH-29 were utilized for percolation tests prior to backfill. Percolation test procedures and test results are further discussed in report section 7.0, *Percolation Testing* and Appendix D.

The approximate locations of the exploratory borings are shown in Drawing No. 2, *Site Plan and Boring Location Map*. Detailed descriptions of the field exploration and sampling program are presented in Appendix A, *Field Exploration*.

3.3 Laboratory Testing

Representative samples of the site soils were tested in the laboratory to aid in the classification and to evaluate relevant engineering properties. The tests performed included:

- In Situ Moisture Contents and Dry Densities (ASTM Standard D2216)
- Grain Size Distribution (ASTM Standard C136)
- Fines Content/Passing No. 200 Sieve (ASTM D1140)
- Atterberg Limits (ASTM D4318)
- Maximum Dry Density and Optimum-Moisture Content Relationship (ASTM Standard D1557)
- Direct Shear (ASTM Standard D3080)
- Consolidation (ASTM Standard D2435)
- Expansion Index (ASTM Standard D4829)

- R-value (ASTM Standard D2844)
- Soil Corrosivity Tests (Caltrans 643, 422, 417, and 532)

For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*. For *in-situ* moisture and density data, see the Logs of Borings in Appendix A, *Field Exploration*.

3.4 Engineering Analyses and Report

Data obtained from the exploratory fieldwork and laboratory-testing program were analyzed and evaluated. This report was prepared to provide the findings, conclusions and recommendations developed during our investigation and evaluation.

4.0 GEOLOGIC CONDITIONS

4.1 Regional Geology

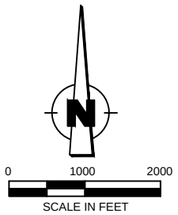
The proposed project site is located in the San Jose Hills along the western edge of the Pomona Valley within the Transverse Ranges geomorphic province of California near the northern terminus of the Peninsular Ranges Province.

The Pomona Valley is situated at the junction of the two major convergent fault systems: 1) Northwest-trending high angle strike slip faults of the San Andreas system projecting from the northern terminus of the Peninsular Ranges Province, and 2) East-trending low angle reverse or reverse-oblique faults bounding the south margin of the Transverse Ranges. Faults in group one include the Palos Verdes, Newport-Inglewood, Whittier-Elsinore and San Jacinto fault zones. Group two faults include the Malibu-Santa Monica, Hollywood, Raymond, Sierra Madre and Cucamonga fault zones.

The Geologic Map of the San Dimas and Ontario Quadrangles prepared by Thomas W. Dibblee, Jr. (DF-91, dated July, 2002) was reviewed. The map shows the location of Mt. San Antonio College campus within an alluvial basin surrounded by hillsides consisting of sedimentary bedrock of the Monterey (Puente) Formation. No faults are shown running through or projecting through the project site. A hillside is depicted within the northeastern portion of the subject site and has been mapped as (Tmy)-Yorba Shale Member consisting of thinly bedded, diatomaceous, semi-siliceous clay shale, siltstone and minor sandstone. A portion of the map by Thomas W. Dibblee has been reproduced and is shown as Drawing No. 3, *Regional Geologic Map*.

4.2 Subsurface Profile of Subject Site

The earth materials encountered during our investigation consist of existing fill soils placed during previous site grading operations, natural alluvial soils and sedimentary bedrock of the Puente Formation. These earth materials consist primarily of clay, clayey



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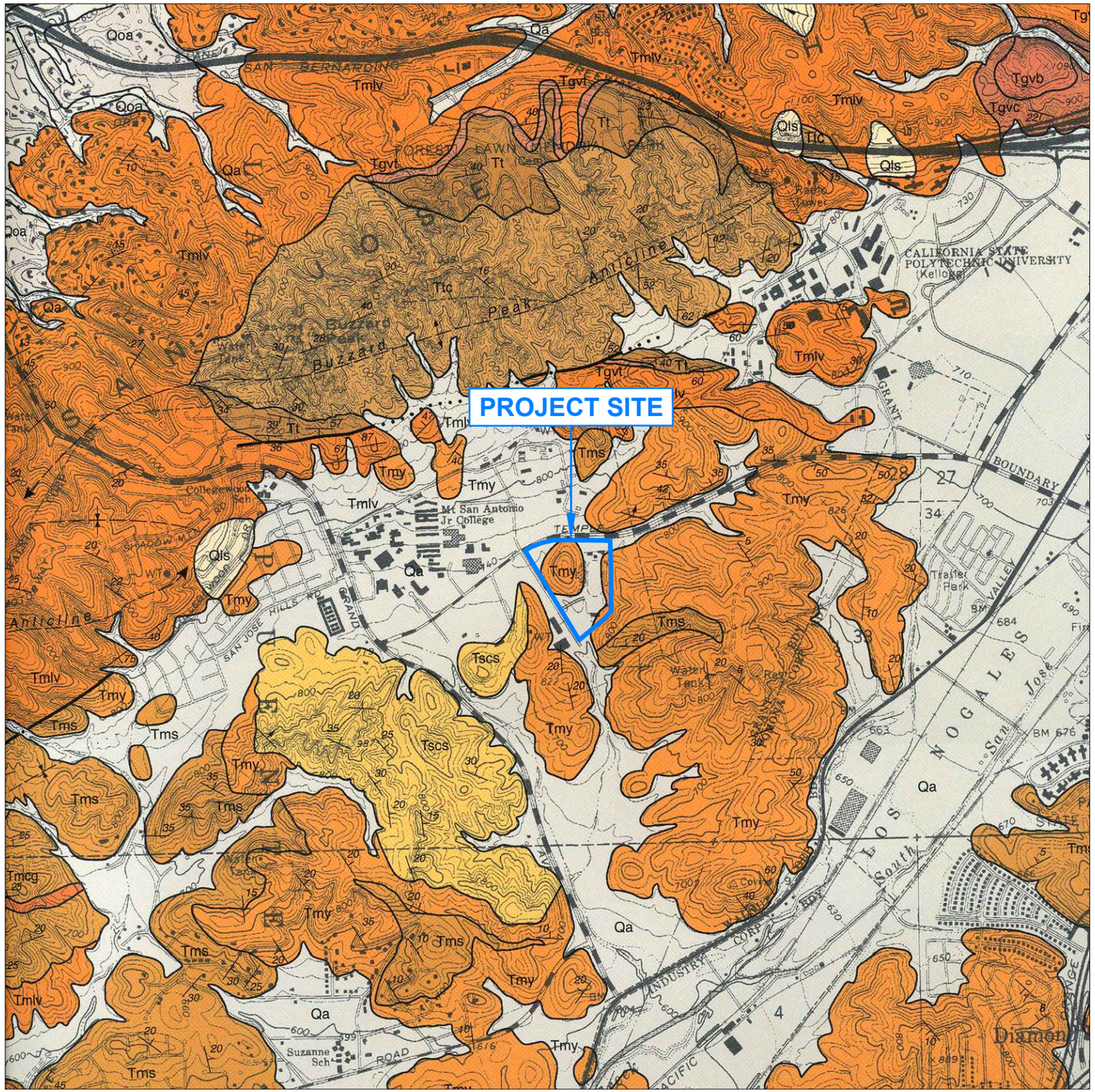


SAN DIMAS AND ONTARIO MAP (DF-91)

LEGEND

af / Qg / Qa

SURFICIAL SEDIMENTS

af *artificial fill*
Qg *alluvial gravel and sand of stream channels, some artificially channelized*
Qa *alluvial gravel and sand of valley areas*

Qls

LANDSLIDE AND TALUS RUBBLE

— UNCONFORMITY —

Qoa / Qog

OLDER, DISSECTED SURFICIAL SEDIMENTS

Qoa *low remnants of elevated alluvial gravel*
Qog *high remnants of elevated older alluvial gravel, including coarse boulder gravel*

— UNCONFORMITY —

SEDIMENTARY AND VOLCANIC ROCKS

Tscg | Tscs

SYCAMORE CANYON FORMATION

Sycamore Canyon Formation (uppermost member of Puente Formation of Durham & Yerkes 1964, Tan 1998) shallow marine clastic latest Miocene age.
Tscg *conglomerate, light gray, of cobbles and pebbles of plutonic rocks in sandstone matrix.*
Tscs *sandstone, light gray, similar to* ***Tms****. Includes some conglomerate similar to* ***Tscg****, and siltstone.*

Tm | Tmy | Tmcg | Tms | Tmlv

MONTEREY (PUENTE) FORMATION

Monterey Formation (Puente form of Eldridge & Arnold, 1907, Durham & Yerkes 1964: Tan 1998, marine biogenic & clastic; late Miocene age, (Mohnian Stage))
Tm *unassigned shale; similar to* ***Tmlv*** *&* ***Tmly***
Tmy *Yorba shale Member – light gray, thin bedded, diatomaceous, semi-siliceous to clay shale, siltstone, minor sandstone; fish scales.*
Tmcg *conglomerate facies of cobbles & pebbles of plutonic rocks in sandstone matrix lenses in unit* ***Tms****, deposited as submarine deltas.*
Tms *Soquel sandstone facies, partly intertongued into* ***Tmy*** *&* ***Tmlv****, light gray to tan, moderately lithified, bedded, arkosic, contains concretions, some interbedded silty shale, derived from plutonic terrane & deposited as submarine fans, unfossiliferous*
Tmlv *La Vida Shale Member, white, weathered; thin bedded, platy, siliceous shale, clay shale, and siltstone, some strata of tan dolomite and sandstone; fish scales, foraminifera.*

Tt | Ttc

TOPANGA FORMATION

(of Shelton, 1955; Tan, 1998, marine clastic middle Miocene age, unfossiliferous, locally interstonged into Glendora volcanics). age late? Miocene
Tt *sandstone, light gray to tan, moderately lithified, bedded, arkosic, locally pebbly, includes interbedded siltstone or clay shale.*
Ttc *conglomerate (Buzzard Peak Conglomerate member of Woodford et al. 1946, light gray to tan, semi-lithified, vaguely bedded, composed of cobbles and pebbles of mostly plutonic rocks in sandstone matrix.*

Tgv | Tgvc | Tgvb | Tgvp | Tgvt | Tgva | Tgvr | Tgve

GLENDORA VOLCANIC ROCKS

Glendora Volcanics (of Shelton, 1955, Tan, 1999; extrusive volcanic rocks; middle Miocene age locally interfongued into Topanga Formation). (radiometric age ±16 MA (Weigand, P.W., oral communication 2001)
Tgv *undifferentiated volcanic rock, mostly brown andesitic flows and breccias*
Tgvc *volcanic conglomerate, gray to brown, of volcanic detritus.*
Tgvb *basalt flows, gray to black, massive to vesicuar.*
Tgvp *basaltic pelagonitic tuff & pillow lavas.*
Tgvt *rhyolitic tuff breccia, tan to white*
Tgva *andesite flows and flow breccias, brown, porphyritic, massive.*
Tgvr *rhyolitic-dacitic flows, tan to light brown, aphanitic, massive to flow-banded, hard, fractured*
Tgve *rhyolite-dacite breccia exposed only at Elephant Hill.*

— UNCONFORMITY —

CRYSTALLINE BASEMENT ROCKS

GRANITIC ROCKS

Tmda

MOUNTAIN MEADOWS DACITE

Mountain Meadows dacite (of Shelton 1955, Tan, 1999 intrusive into qd; early Miocene? Age)
Mda *dacite light gray, hard, massive, fine grained, contains small feldspar phenocrysts and biotite flakes.*

qd | qdb

QUARTZ DIORITIC PLUTONIC ROCKS

quartz diorite; plutonic igneous rock, late Mesozoic- Cretaceous age
qd *biotite quartz diorite, light gray, massive.*
qdb *Bonsall Tonalite of Larsen 1948 similar to* ***qd****, but slightly gneissoid & contains dark gray fine grained xenolithis elongated parallel to gneissoid structure up to 9 in. long.*

Holocene | Pleistocene | Miocene | QUATERNARY | TERTIARY | CENOZOIC | CEOUS | ZOIC

REFERENCE: THOMAS W. DIBBLE, Jr. (DF-91)
SAN DIMAS QUADRANGLE
AND ONTARIO QUADRANGLE (2002)

REGIONAL GEOLOGIC MAP

Converse Consultants

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. 14-31-124-01

Drawing No. 3

sands, sands, and clays. Each of these earth materials is described in more detail below.

Fill Soils

An undocumented fill layer of variable thickness was encountered in a majority of the soil borings drilled intermittently from June 16 to 24, 2014, within the subject site. The depth of the fill ranges from approximately less than one (1) foot to sixteen (16) feet. The observed fill soils consist primarily of clay, sandy clay and clayey sands. Most of the fill soils appear to have been locally derived from cut slopes and from the general site areas during original site grading and development. Documentation concerning the placement and degree of compaction of the fill soils was not available.

Alluvium

Alluvial deposits were encountered underlying the fill material at the project site. The native soil encountered in the borings consists primarily of clayey sands, clay, silty sands and sandy clays with occasional gravels and cobbles. The soils also include occasional fragments of weathered bedrock. We expect that cobbles are larger in size than the largest observed, approximately four (4) inches in the maximum dimension, in the hollow stem auger soil cuttings. Based on our previous experience and knowledge of the area, and materials encountered during subsurface exploration, cobbles greater than eight (8) inches and occasional boulders may also be buried below the site (Converse 2013). The depth of the alluvial soils varies from approximately zero (0) feet to fifty three (53) feet across the project site.

It should be noted that the alluvial soil on site exhibits a low-to-high expansive potential. Natural residual soils that develop above the Puente Formation tend to be expansive clays and are derived from the mechanical breakdown of the bedrock, particularly the shale components, which are composed of lithified clay. These materials should be mitigated per the earthwork recommendations provided herein.

Siltstone, Sandstone, Claystone and Conglomerate Bedrock (Tpss)

The western and eastern portions of the proposed site are underlain by sedimentary bedrock of the Puente Formation, which consists of laminated to thinly-bedded siltstone, sandstone, and shale. The bedded bedrock exhibited moderately steep to near-vertical bedding in the samples (45 to 90 degrees), but due to the limitations of the sampling performed, the dip direction is uncertain. Geologic mapping of bedrock cuts at the site indicate bedding that generally strikes northeastward and dips northwestward 42 to 65 degrees. The bedrock tends to be slightly fractured to fractured, with caliche and gypsum crystals developing along fracture surfaces.

Sandstone and Pebble Conglomerate Bedrock (Tpcg)

The northwest portion of the hilltop west of the stadium is underlain by harder, cemented sandstone pebble conglomerate bedrock. The harder conglomerate bedrock consists of gravel and cobble-sized rocks in a cemented sandy matrix. The conglomerate is massive and may contain boulder-sized hard rock material. The conglomerate bedrock materials were observed to be very hard in previous explorations by (Converse 2013) and will be more difficult to excavate during construction.

For additional information on the subsurface conditions, see the Logs of Boring Data in Appendix A, *Field Exploration*.

Subsurface geologic conditions beneath the subject site are depicted on *Geologic Cross-Sections A-A' through D-D'* as shown on Drawing No. 4. The geologic cross-sections show the interpreted extent and limits of the different types of subsurface materials encountered during our study. The cross-sections show the existing surface improvements in relation to the proposed developments.

4.3 Groundwater

The site is situated within the Puente Basin portion of the larger San Gabriel Valley Groundwater Basin. Local zones of perched groundwater were encountered during subsurface exploration at a depths ranging from approximately 17 to 38 feet bgs in borings BH-1, BH-14, BH-20, BH-21, BH-23, BH-24, BH-25, and BH-26. Higher groundwater levels at the site are likely attributed to the buried drainage channel below the track and field and practice field still which transmits water along its axis southward. It appears the groundwater encountered during the exploration is localized within the buried channels of historical drainages and is not likely to be encountered in areas away from the buried drainages. Canyon bottom subdrain devices should be installed along the axes of the buried channels during grading operations, as described herein, to transmit the subsurface water to an approved outlet location. One buried channel runs beneath the track and field stadium and contains buried drain pipes for the detention basin located northeast of the stadium.

Wet weather periods may produce groundwater seepage in the bedrock fractures and along less permeable layers from infiltration of rainfall, surface flow and runoff and should be anticipated during grading and construction. In general, groundwater levels fluctuate with the seasons. Groundwater conditions below any given site vary depending on numerous factors including seasonal rainfall, local irrigation, and groundwater pumping, among other factors. The regional groundwater table is not expected to be encountered during the planned construction. However, the possibility of perched groundwater encountered during future grading and excavation cannot be completely precluded.

4.4 Subsurface Variations

Based on results of the subsurface exploration and our experience with the subject area, some variations in the continuity and nature of subsurface conditions within the project site are anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material at the site, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations. If, during construction, subsurface conditions different from those presented in this report are encountered, this office should be notified immediately so that recommendations can be modified, if necessary.

5.0 FAULTING AND SEISMIC HAZARDS

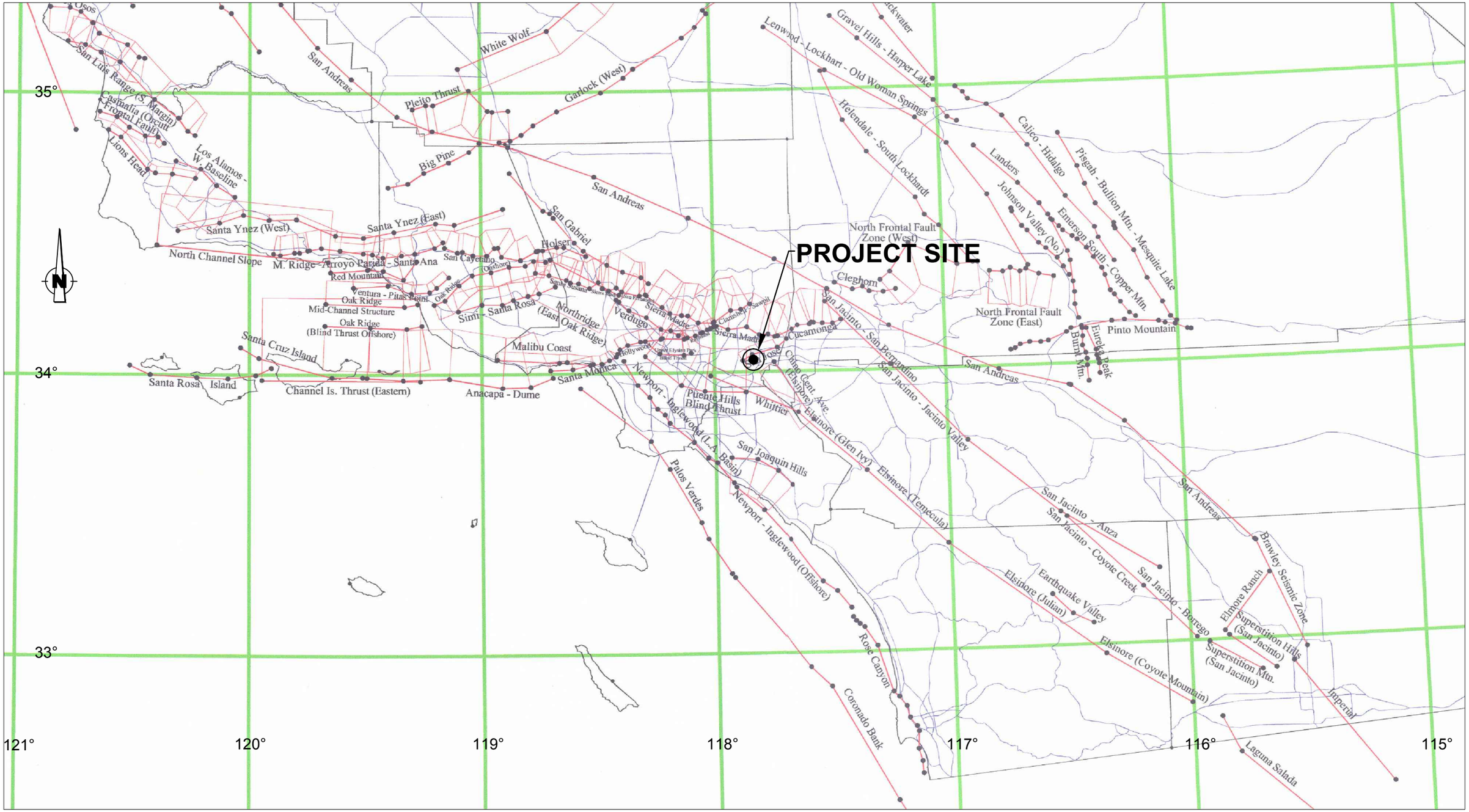
Geologic hazards are defined as geologically related conditions that may present a potential danger to life and property. Typical geologic hazards in Southern California include earthquake ground shaking, fault surface rupture, liquefaction and seismically induced settlement, lateral spreading, landslides, earthquake induced flooding, tsunamis and seiches, and volcanic eruption hazard.

Results of a site-specific evaluation for each type of possible seismic hazards are discussed in the following sections.

5.1 Seismic Characteristics of Nearby Faults

No surface faults are known to project through or towards the site. The closest known faults to the project site with mappable surface expressions are the San Jose Fault (0.8 kilometers to the north) and Chino-Central Avenue (Elsinore) Fault (6.9 kilometers to the east/ southeast). The concealed Puente Hills Blind Thrust Fault (Coyote Hills segment) along with other regional faults was included as active fault sources for the probabilistic seismic hazard analysis for the site. The approximate locations of these local active faults with respect to the project site are tabulated on Table No. 2, *Summary of Regional Faults,* and are shown on Drawing No. 3, *Regional Geological Map* and Drawing No. 5, *Southern California Regional Fault Map*.

The Pomona Valley Basin is bounded to the north by the San Jose Fault and to the southwest by the Chino-Central Avenue faults. These two fault systems do not exhibit evidence of surface movement within Holocene time and are not considered active based on current geologic information. The San Jose and Chino-Central Avenue faults are considered Late Quaternary, having exhibited displacement and movement within the past 738,000 years.



REFERENCE: PORTION OF CGS 2002 CALIFORNIA FAULT MODEL MODIFIED FOR USE WITH FRISKSP AND EQFAULT BY THOMAS F. BLAKE, AUGUST 2004

FAULT SOURCES

BLIND THRUST FAULT, POLYGONS INDICATE RUPTURE PLANES AND DIP DIRECTION

SOUTHERN CALIFORNIA REGIONAL FAULT MAP

Converse Consultants

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. 14-31-124-01

Drawing No. 5

San Jose Fault

The San Jose Fault lies along the southern flank of the northeast trending San Jose Hills. The fault trends northeast and dips to the north. The mapped trace of the San Jose Fault is located approximately 2,500 to 4,200 feet (0.76 to 1.28 kilometers) north of the project.

Geotechnical investigations performed on the campus of California State Polytechnic University at Pomona (Geocon, 2001) indicated that the San Jose is an active reverse separation fault. Because of the lack of success in previous fault trench excavations, Geocon based its conclusions on a series of closely spaced boreholes along several traverses across a subtle topographic bench on the campus. They discovered two shallowly to moderately north-dipping thrust faults with the most recent displacement being about 1 meter and occurred since 3500 yrs. B.P. on the basis of radiocarbon dating of faulted alluvium. These findings would show this segment of the fault is active, but is a reverse separation fault south of the San Jose Hills (Yeats, 2004).

Chino-Central Avenue Faults

The Chino and Central Avenue faults trend northwest along the southwest portion of the Chino Basin. The fault ties along the northeast edge of the Puente Hills. The Chino and Central Avenue faults are considered part of the Elsinore fault which is one of the major right lateral strike slip faults of the Peninsular Ranges geomorphic province. The Elsinore fault splits near Prado Dam into the Chino-Central Avenue and Whittier faults. The Chino-Central Avenue faults are two separate fault strands that strike northwest. The Chino fault dips southwest and is at least 18 km in length. The Central Avenue fault is about 8 km in length and concealed by younger alluvial deposits.

As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site.

Table No. 2, *Summary of Regional Faults,* summarizes selected data of known faults capable of seismic activity within 50 kilometers of the site. The data presented below was calculated using EQFAULT Version 3.0 with updated fault data from “The Revised 2002 California Probabilistic Seismic Hazard Maps (Cao et al., 2003)”, Appendix A, and other published geologic data.

Table No. 2, Summary of Regional Faults

Fault Name and Section	Approximate * Distance to Site (kilometers)	Max. Moment Magnitude (Mmax)	Slip Rate (mm/yr)
San Jose*	0.8	6.4	0.50
Chino-Central Ave. (Elsinore)	6.9	6.7	1.00
Elysian Park Blind Thrust*	8.2	6.7	1.50
Puente Hills Blind Thrust**	8.3	7.3	0.70
Sierra Madre*	9.6	7.2	2.00
Whittier	12.6	6.8	2.50
Cucamonga*	13.8	6.9	5.00
Clamshell-Sawpit	19.5	6.5	0.50
Raymond	19.6	6.5	1.50
Verdugo*	28.6	6.9	0.50
Elsinore-Glen Ivy	29.1	6.8	5.00
Compton Thrust	29.9	6.8	1.50
Hollywood	36.2	6.4	1.00
San Jacinto – San Bernardino	38.0	6.7	12.00
San Andreas – 1857 Rupture*	39.1	7.4	30.00
San Andreas – Mojave*	39.1	7.4	30.00
Newport-Inglewood (L.A. Basin)*	39.6	7.1	1.00
San Andreas – San Bernardino*	41.0	7.5	24.00
San Andreas – Southern*	41.0	7.2	25.00
Cleghorn*	45.7	6.7	2.00
Sierra Madre (San Fernando)*	48.4	6.7	2.00

*****Review of published geologic data and mapping including Appendix A of the 2002 California Fault Parameters Report (Cao et al., 2003). Distance from the site to nearest subsurface projection, per Shaw et al., 2002.

5.2 Seismic History

An analysis of the seismic history of the site was conducted using the computer program EQSEARCH, (Blake, 2000), and attenuation relationships proposed by Boore et al. (1997) for alluvium soil conditions. The Southern California Earthquake Catalog with the Southern California Earthquake Center was also utilized (SCEC, 2011).

Based on the analysis of seismic history, the number of earthquakes with a moment magnitude of 5.0 or greater occurring within a distance of 100 kilometers was 169, since the year 1800. Based on the analysis, the largest earthquake-induced ground acceleration affecting the site since the year 1800 is a 7.0 magnitude earthquake in 1858 with a calculated ground acceleration of 0.24g at the site.

Review of recent seismological and geophysical publications indicates that the seismic hazard for the Pomona Basin is high. The Pomona Basin is bounded by active regional faults on all sides and underlain by alluvial sediments and buried thrust faults. The seismic hazard for the heavily populated Pomona Basin was illustrated by the 1971 San Fernando, 1987 Whittier Narrows, 1991 Sierra Madre, 1994 Northridge and July 2008 Chino Hills earthquakes. The epicenters for these earthquakes are shown on Drawing No. 6, *Epicenters Map of Southern California Earthquakes (1800-1999).*

5.3 Surface Fault Rupture

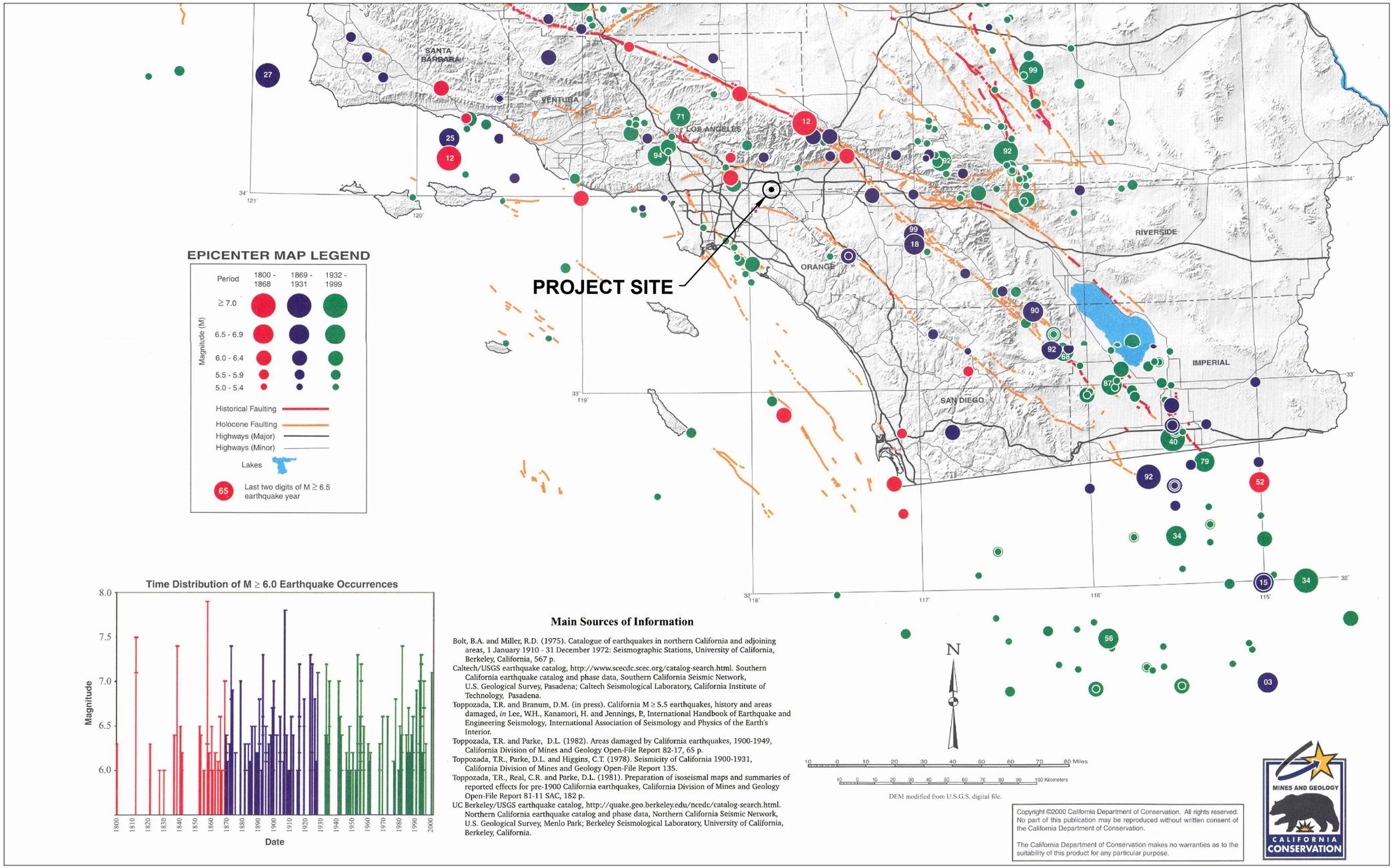
The project site is not located within a currently designated State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zones) for surface fault rupture. The Alquist-Priolo Earthquake Fault Zoning Act requires the California Geological Survey to zone "active faults" within the State of California. An "active fault" has exhibited surface displacement with Holocene time (within the last 11,000 years) hence constituting a potential hazard to structures that may be located across it. Public school structures are required to be set-back at least 50 feet from an active fault. The active fault set-back distance is measured perpendicular from the dip of the fault plane. Based on a review of existing geologic information, no known active faults project through or toward the site. The potential for surface rupture resulting from the movement of the nearby major faults is considered remote.

5.4 Liquefaction and Seismically-Induced Settlement

Liquefaction is the sudden decrease in the strength of cohesionless soils due to dynamic or cyclic shaking. Saturated soils behave temporarily as a viscous fluid (liquefaction) and, consequently, lose their capacity to support the structures founded on them. The potential for liquefaction decreases with increasing clay and gravel content, but increases as the ground acceleration and duration of shaking increase. Liquefaction potential has been found to be the greatest where the groundwater level and loose sands occur within 50 feet of the ground surface.

The site is partially located within a potential liquefaction zone per the State of California Seismic Hazard Zones Map for the San Dimas Quadrangle as shown in Drawing No. 7, *Seismic Hazard Map*. Liquefaction analyses were performed using *LiquefyPro,* Version 5.8n, 2012, by Civil Tech Software for the upper 50 feet below ground surface utilizing borings BH-14 and BH-26. The results of the liquefaction analysis and a summary of the methods used are presented in Appendix C, *Liquefaction/Seismic Settlement Analysis*.

The results of liquefaction analyses indicate the project site is not susceptible to liquefaction. The estimated potential seismically induced settlement ranges from approximately 0.67 to 0.87 inches with potential differential settlement ranging from



Time Distribution of M ≥ 6.0 Earthquake Occurrences

Main Sources of Information

Bolt, B.A. and Miller, R.D. (1975). Catalogue of earthquakes in northern California and adjoining areas, 1 January 1910 - 31 December 1972: Seismographic Stations, University of California, Berkeley, California, 567 p.

Caltech/USGS earthquake catalog, http://www.scecdc.scec.org/catalog-search.html. Southern California earthquake catalog and phase data, Southern California Seismic Network, U.S. Geological Survey, Pasadena; Caltech Seismological Laboratory, California Institute of Technology, Pasadena.

Toppozada, T.R. and Branum, D.M. (in press). California M ≥ 5.5 earthquakes, history and areas damaged, *in* Lee, W.H., Kanamori, H. and Jennings, P, International Handbook of Earthquake and Engineering Seismology, International Association of Seismology and Physics of the Earth's Interior.

Toppozada, T.R. and Parke, D.L. (1982). Areas damaged by California earthquakes, 1900-1949, California Division of Mines and Geology Open-File Report 82-17, 65 p.

Toppozada, T.R., Parke, D.L. and Higgins, C.T. (1978). Seismicity of California 1900-1931, California Division of Mines and Geology Open-File Report 135.

Toppozada, T.R., Real, C.R. and Parke, D.L. (1981). Preparation of isoseismal maps and summaries of reported effects for pre-1900 California earthquakes, California Division of Mines and Geology Open-File Report 81-11 SAC, 182 p.

UC Berkeley/USGS earthquake catalog, http://quake.geo.berkeley.edu/ncedc/catalog-search.html. Northern California earthquake catalog and phase data, Northern California Seismic Network, U.S. Geological Survey, Menlo Park; Berkeley Seismological Laboratory, University of California, Berkeley, California.

MINES AND GEOLOGY
CALIFORNIA CONSERVATION

REFERENCE: PORTION OF EPICENTERS AND AREAS DAMAGED BY M≥5 CALIFORNIA EARTHQUAKES, 1800-1999 CALIFORNIA DEPARTMENT OF CONSERVATION, MAP SHEET 49 DATED 2000.

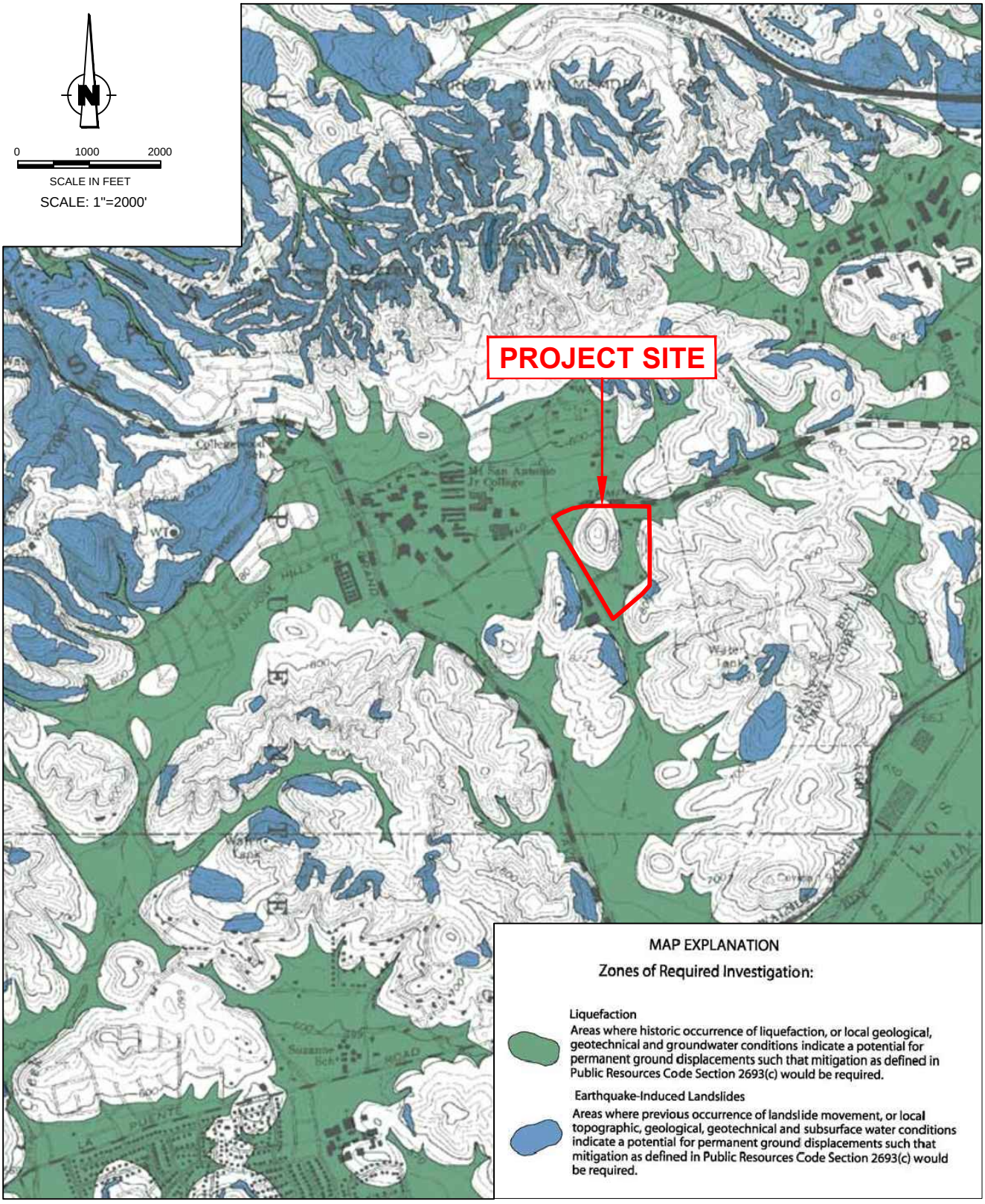
EPICENTER MAP OF SOUTHERN CALIFORNIA EARTHQUAKES (1800-1999)

Converse Consultants

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. 14-31-124-01

Drawing No. 6



REFERENCE: SAN DIMAS QUADRANGLE 1999
SEISMIC HAZARD ZONES STATE OF CALIFORNIA

SEISMIC HAZARD ZONES MAP

Converse Consultants

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. 14-31-124-01

Drawing No. 7

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approximately 0.34 to 0.44 inches. The project structural engineer should consider the effects of seismically-induced settlement in the foundation design.

5.5 Lateral Spreading

Seismically induced lateral spreading involves primarily lateral movement of earth materials due to ground shaking. It differs from the slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. The topography at the project site and in the immediate vicinity of the site is relatively flat, with no significant nearby slopes or embankments. Under these circumstances, the potential for lateral spreading at the subject site is considered negligible.

5.6 Seismically-Induced Slope Instability

Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The project site is also not shown with any earthquake-induced landslide areas due to the relatively flat condition of the site topography. In the absence of significant ground slopes, the potential for seismically induced landslides to affect the proposed site is considered to be very low.

5.7 Earthquake-Induced Flooding

Review of the Flood Insurance Rate Map (FIRM), Panel 1725 of 2350, from the FEMA Map Service Center Viewer, indicates that the site is in an area designated as Zone D, “Areas in which flood hazards are undetermined, but possible.” Due to the absence of groundwater at shallow depths, distance of the subject site from large bodies of water and regional flood control structures, the potential for flooding at the subject site is considered remote.

5.8 Tsunami and Seiches

Tsunamis are seismic sea waves generated by fault displacement or major ground movement. Based on the location of the site from the ocean (over 20 kilometers), tsunamis do not pose a hazard. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Based on site location away from lakes and reservoirs, seiches do not pose a hazard.

5.9 Volcanic Eruption Hazard

There are no known volcanoes near the site. According to Jennings (1994), the nearest potential hazards from future volcanic eruptions is the Amboy Crater-Lavic Lake area

located in the Mojave Desert more than 120 miles east/northeast of the site. Volcanic eruption hazards are not present.

6.0 SEISMIC ANALYSIS

6.1 CBC Seismic Design Parameters

Seismic parameters based on the 2013 California Building Code are calculated using the United States Geological Survey *U.S. Seismic Design Maps* website application and the site coordinates (34.0458 degrees North Latitude, 117.8469 degrees West Longitude). The seismic parameters are presented below.

Table No. 3, CBC Seismic Design Parameters

Seismic Parameters	2013 CBC
Site Class	D
Mapped Short period (0.2-sec) Spectral Response Acceleration, S_S	2.186 g
Mapped 1-second Spectral Response Acceleration, S_1	0.781 g
Site Coefficient (from Table 1613.5.3(1)), F_a	1.0
Site Coefficient (from Table 1613.5.3(2)), F_v	1.5
MCE 0.2-sec period Spectral Response Acceleration, S_{MS}	2.186 g
MCE 1-second period Spectral Response Acceleration, S_{M1}	1.171 g
Design Spectral Response Acceleration for short period, S_{DS}	1.457 g
Design Spectral Response Acceleration for 1-second period, S_{D1}	0.781 g
Seismic Design Category	E

6.2 Site-Specific Response Spectrum

The subject site is partially located in a Seismic Hazard Zone. Based on 2013 CBC Section 1616A.1.3, a site-specific ground motion analysis is required A site-specific response spectrum was developed for the project for a Maximum Considered Earthquake (MCE), defined as a horizontal peak ground acceleration that has a 2 percent probability of being exceeded in 50 years (return period of approximately 2,475 years).

In accordance with ASCE 7-10, Section 21.2 the site-specific response spectra can be taken as the lesser of the probabilistic maximum rotated component of MCE ground motion and the 84th percentile of deterministic maximum rotated component of MCE ground motion response spectra. The design response spectra can be taken as 2/3 of site-specific MCE response spectra, but should not be lower than 80 percent of CBC general response spectra. The risk coefficient C_R has been incorporated at each spectral response period for which the acceleration was computed in accordance with ASCE 7-10, Section 21.2.1.1.

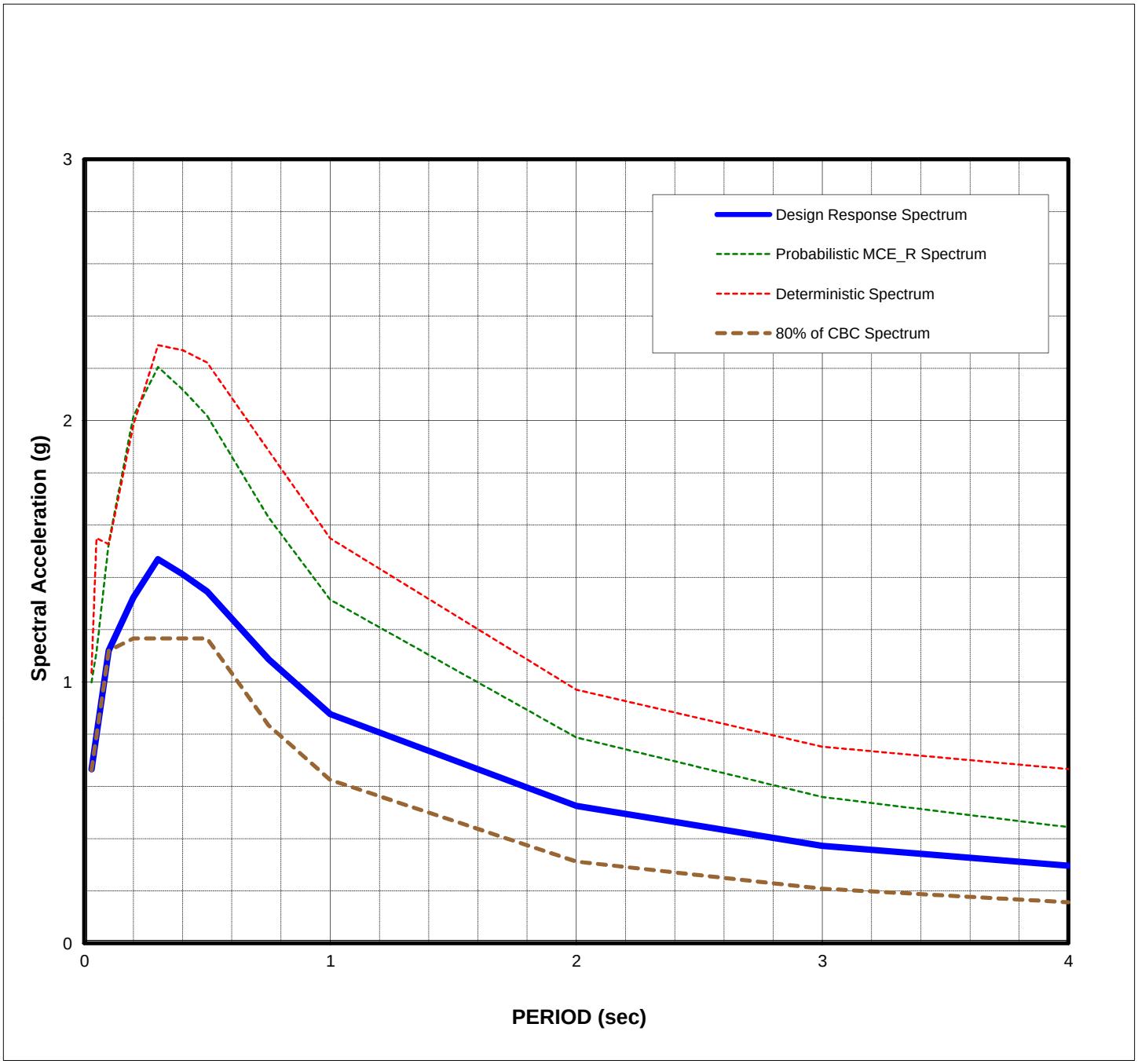
The 2013 CBC mapped acceleration parameters are provided in the following table. These parameters were determined using the United States Geological Survey *U.S. Seismic Design Maps* website application, and in accordance with ASCE 7-10 Sections 11.4, 11.6, 11.8 and 21.2.

Table No. 4, 2013 CBC Mapped Acceleration Parameters

Site Class	D	Seismic Design Category	E
S_s	2.186	C_{RS}	1.013
S_1	0.781	C_{R1}	1.023
F_a	1	**0.08 F_v/F_a**	0.120
F_v	1.5	**0.4 F_v/F_a**	0.600
S_{MS}	2.186	T_0	0.107
S_{M1}	1.172	T_S	0.536
S_{DS}	1.457	T_L	8
S_{D1}	0.781		

A Site-Specific response analysis, using faults within 100 kilometers of the site, was developed using the computer program EZ-FRISK by Risk Engineering (v. 7.62) and the 2008 USGS Fault Model database. Attenuation relationships proposed by Boore and Atkinson (2008), Campbell and Bozorgnia (2008), Chiou and Youngs (2008) were used in the analysis. These attenuation relationships are based on Next Generation Attenuation (NGA) project model. Maximum rotated components were determined using Huang (2008) method. An average shear wave velocity at upper 30 meters of soil profile (V_{s30}) of 270 meters per second, depth to bedrock of with a shear wave velocity 1,000 meters per second at 150 meters below grade, and depth of bedrock where the shear wave velocity is 2,500 meters per second at 3,000 meters below grade were selected for EZ-Frisk Analysis.

Applicable response spectra data are presented in the table below and on Drawing No. 8, *Site-Specific Design Response Spectrum.* These curves correspond to response values obtained from above attenuation relations for horizontal elastic single-degree-of-freedom systems with equivalent viscous damping of 5 percent of critical damping.



Note: Calculated using EZFRISK program Risk Engineering, version 7.62
and USGS 2008 fault model database.

SITE SPECIFIC DESIGN RESPONSE SPECTRUM

Mt. SAC Athletic Complex East

Walnut, CA

For : Mt. San Antonio College

Project Number:

14-31-124-01

Converse Consultants

Drawing No.

8

Table No. 5, Site-Specific Response Spectrum Data

Period (sec)	2% in 50yr Probabilistic Spectral Acceleration (g)	Risk Coefficient C_R	Probabilistic MCE_R Spectral Acceleration (g)	84th Percentile Deterministic MCE Response Spectra, (g)	Deterministic CBC Lower Level, (g)	Site Specific MCE_R Spectral Acceleration (g)	80% CBC Design Response Spectrum	Site Specific Design Spectral Acceleration (g)
0.03	0.985	1.013	0.998	1.034	0.825	0.998	0.662	**0.665**
0.05	1.099	1.013	1.113	1.550	0.975	1.113	0.793	**0.793**
0.10	1.515	1.013	1.535	1.527	1.350	1.527	1.119	**1.119**
0.20	1.991	1.013	2.017	1.983	1.500	1.983	1.166	**1.322**
0.30	2.174	1.014	2.204	2.288	1.500	2.204	1.166	**1.469**
0.40	2.087	1.015	2.118	2.269	1.500	2.118	1.166	**1.412**
0.50	1.987	1.016	2.018	2.222	1.500	2.018	1.166	**1.345**
0.75	1.600	1.018	1.629	1.884	1.200	1.629	0.833	**1.086**
1.00	1.288	1.020	1.314	1.549	0.900	1.314	0.625	**0.876**
2.00	0.772	1.020	0.787	0.970	0.450	0.787	0.312	**0.525**
3.00	0.548	1.020	0.559	0.752	0.300	0.559	0.208	**0.373**
4.00	0.435	1.020	0.444	0.666	0.225	0.444	0.156	**0.296**

Vertical acceleration at the site may be calculated using the ASCE 7-10, Section 12.4.

The site-specific design response parameters are provided in the following table. These parameters were determined from Design Response Spectra presented in table above, and following guidelines of ASCE Section 21.4.

Table No. 6, Site-Specific Seismic Design Parameters

	Design Parameters (5% Damping)	Lower Limit, 80% of CBC Design Spectra
Site-Specific 0.2-second period Spectral Response Acceleration, S_{MS}	1.984	1.749
Site-Specific1-second period Spectral Response Acceleration, S_{M1}	1.575	0.937
Site-Specific Design Spectral Response Acceleration for short period S_{DS}	1.322	1.166
Site-Specific Design Spectral Response Acceleration for 1-second period, S_{D1}	1.050	0.625

7.0 PERCOLATION TESTING RESULTS

Percolation testing was performed utilizing exploratory borings BH-22 and BH-29 on June 19, 2013. The tests were performed using the falling head test method in accordance with Los Angeles County “Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting”. The results of the percolation tests are tabulated below and presented in Appendix D, *Percolation Testing*.

Table No. 7, Percolation Testing Results

Boring No.	Depth of Boring* (feet)	Predominant Soil Types (USCS)	Average Percolation Rate (inches/hour)	Lowest Percolation Rate (inches/hour)
BH-22	10	Clay (CL)	0.28	0.12
BH-29	10	Clayey Sand (SC)	0.92	0.59

*Approximate

In accordance with County of Los Angeles requirements, the minimum percolation rate for design of infiltration system for storm water management is 0.5 inch per hour. Therefore the soils at the parking lot area in the northwestern portion of the site are suitable for infiltration system. The project Civil Engineer shall review the raw data of percolation test presented in *Appendix D* to determine specific soil layers and percolation rates for design of the proposed infiltration system. Infiltration system should be properly maintained periodically to minimize sedimentation in the infiltration system. A proposed infiltration system must comply with the following setbacks in accordance with Los Angeles County guideline.

Table No. 8, Infiltration Facility Setback Requirements per Los Angeles County

Setback from	Distance
Property lines and public right of way	5 feet
Any foundation	15 feet or within 1:1 plane drawn up from the bottom of foundation, whichever greater
Face of any slope	H/2, 5 feet minimum (H is height of slope)
Water wells used for drinking water	100 feet

8.0 GEOTECHNICAL EVALUATIONS AND CONCLUSIONS

Based on the results of our background review, subsurface exploration, laboratory testing, geotechnical analyses, and understanding of the planned site re-development, it is our opinion that the proposed project is feasible from a geotechnical standpoint, provided the following conclusions and recommendations are incorporated into the project plans, specifications, and are followed during site construction.

The following is a summary of the major geologic and geotechnical factors to be considered for the planned project:

- There are no known active faults projecting toward or extending across the proposed site. The project site is not located within a currently designated State of California Earthquake Fault Zone (formerly Alquist-Priolo Special Studies Zones) for surface fault rupture.

- The site is partially located within a mapped Seismic Hazard Zone for liquefaction. Liquefaction analyses were performed for the upper 50 feet below ground surface utilizing borings BH-14 and BH-26. Based on the results of liquefaction analyses indicate the project site is not susceptible to liquefaction. The estimated potential liquefaction induced settlement ranges from approximately 0.67 to 0.87 inches with potential differential settlement ranging from approximately 0.34 to 0.44 inches.

- Local zones of perched groundwater were encountered during subsurface exploration at a depths ranging from approximately 17 to 38 feet bgs in borings BH-1, BH-14, BH-20, BH-21, BH-23, BH-24, BH-25, and BH-26. Localized perched groundwater seepage should be anticipated during excavations.

- Variable thickness undocumented fill soils were encountered in the borings. The undocumented fill is not considered suitable for any slab or foundation support.

- Based on the proposed plan, cut-and-fill grading operations are required to achieve the planned finished grades.

- Shallow footings or deep foundations are considered suitable for structure support provided the recommendations in this report are incorporated into the project plans, specifications, and are followed during site construction. Foundation recommendations are based on the different subsurface soils anticipated beneath planned structure. The earth materials anticipated at the subject site and the foundation recommendations are summarized in the following table:

Table No. 9, Earth Materials and Foundation Recommendations of Planned Structures

Structure	Approximate Lowest Floor Elevation (MSL)	Anticipated Materials Beneath Planned Structure	Fill Thickness* (feet)	Foundation Recommendations
Field House	731	Bedrock (Tpss)	0 to 10	Shallow Foundations
Gateway Building	748	Fill- Clay (CL)	5 to 10	Deep Foundations
New Restroom Building	740	Bedrock (Tpss)	0 to 7	Shallow Foundations
Visitor Bleachers	731	Bedrock (Tpss)	None	Shallow Foundations
Pedestrian Bridge	730	Fill- Clay (CL)	4 to 5	Pier Foundations
Retaining Walls	731	Fill- Clay (CL)	15	Pier Foundations
Scoreboard	731	Fill- Clay (CL)	13	Deep Foundations

*Approximate

- Based on the proposed plan, cut-and-fill grading operations are required to achieve the planned finished grades.

- The on-site soil has a “Low to High” expansive potential and requires mitigation. On-site clayey soils with an expansion index exceeding 20 should not be re-used for compaction within 2 feet below the proposed foundations or for retaining wall backfill. Soils containing organic materials should not be used as structural fill. The extent of removal should be determined by the geotechnical representative based on soil observation during grading.

- Site soils have “negligible” concentrations of water soluble sulfates.

- In general the pH value, chloride content, and saturated resistivity of the site soils are in the non-corrosive range. However, the saturated resistivity of samples taken, indicate a “Corrosive” potential to ferrous metals.

- The earth materials at the site should be excavatable with conventional heavy-duty earth moving and trenching equipment. The on-site materials contain about 5 to 10 percent gravel up to 3 inches in maximum dimension. Larger gravels, cobbles and possible boulders may exist at the site. Earthwork should be performed with suitable equipments for gravelly materials.

- Buried drain pipes are located beneath the current track and field which drain the detention basin located northeast of the stadium. The condition of the drain pipe should be evaluated for future use. Should the pipe be corroded or damaged, it should be replaced.

9.0 EARTHWORK AND SITE GRADING RECOMMENDATIONS

9.1 General Evaluation

Based on our field exploration, laboratory testing, and analyses of subsurface conditions at the site, remedial grading is required to prepare the site for support of the proposed structures. The subject site has slight slope. It is anticipated that the site preparation will include both cut and fill. To reduce differential settlement, variations in the soil type, degree of compaction, and thickness of the compacted fill, the thickness of compacted fill placed underneath the footings should be kept uniform.

Site grading recommendations provided below are based on our experience with similar projects in the area and our evaluation of this investigation. It is our understanding that site preparation will require removal of existing structures with their foundations and other existing underground manmade structures and utilities.

The site soils can be excavated utilizing conventional heavy-duty earth-moving equipment. The excavated site soils, free of vegetation, shrub and debris, may be placed as compacted fill in structural areas after proper processing. Rocks larger than three (3)

inches in the largest dimension should not be placed as fill. Rocks larger than one (1) inch should not be placed within the upper 12 inches of subgrade soils.

On-site clayey soils and with an expansion index exceeding 20 should not be re-used for compaction within 2 feet below the proposed foundations or for retaining wall backfill. Soils containing organic materials should not be used as structural fill. The extent of removal should be determined by the geotechnical representative based on soil observation during grading

9.2 Over-Excavation/Removal

Different earth materials should be anticipated at excavation bottom of the planned foundation level. In order to provide a relative uniform bearing material below shallow foundations, over-excavation and re-compaction of below the foundations and slab-on-grades are recommended. For structures with shallow footings, we recommend footings be all on bedrock or a minimum of 3 feet of onsite soils below the bottom of foundations should be removed, moisture-conditioned if necessary and replaced as compacted fill.

The excavation to remove unsuitable soils should be extended to five (5) feet laterally beyond the building limits and appendages where space is available. All loose, soft or disturbed earth materials should be removed from the bottom of excavations before placing structural fill. Thickness of compacted fill underneath the buildings should not vary. Cut/Fill transition areas should be over excavated and recompacted to provide uniform fill support. After the required removals have been made, the exposed native earth materials shall be excavated to provide a zone of structural fill for the support of footings, slabs-on-grade, and exterior flatwork. The fill thickness under structures should be kept at a uniform thickness.

As an alternative to deep foundations, over-excavation and re-compaction for the Gateway Building, retaining walls, and pedestrian bridge may be as follows. Over-excavation and re-compaction for the Gateway Building area should be a minimum of 5 feet. For retaining walls up to 24 inches we recommend over-excavation be at least 2 feet below existing grade and 2 feet laterally beyond the foot prints, where space is available. For retaining walls between 24 inches and 54 inches we recommend over-excavation be at least 4 feet below existing grade and 2 feet laterally beyond the foot prints, where space is available. For retaining walls greater than 54 inches we recommend over-excavation be at least 5 feet below existing grade or depth of undocumented fill, whichever is greater, and 2 feet laterally beyond the foot prints, where space is available. For the proposed pedestrian bridge we recommend over-excavation be at least 5 feet below existing grade or depth of undocumented fill, whichever is greater, and 5 feet laterally beyond the foot prints, where space is available.

For IAAF compliant track and field and artificial turf areas, we recommend over-excavation be at least 2 feet below existing grade and 2 feet laterally beyond the foot prints, where space is available. These areas should be backfilled with proper subgrade materials that meet the specifications by IAAF.

The exposed bottom of the over-excavation area should be scarified at least 6 inches, moisture conditioned as needed to near-optimum moisture content, and compacted to 90 percent relative compaction. Over-excavation should not undermine adjacent off-site improvements. Remedial grading should not extend within a projected 1:1 (horizontal to vertical) plane projected down from the outer edge of adjacent off-site improvements. If soft loose, yielding soil conditions are encountered at the excavation bottom, the following options can be considered:

a. Over-excavate until reach firm bottom.
b. Scarify or over-excavate additional 18 inches deep, and then place at least 18-inch-thick compacted base material (CAB or equivalent) to bridge the soft bottom. Base should be compacted to 90% relative compaction.
c. Over-excavate additional 18 inches deep, and then place a layer of geofabric i.e. Marifi HP570, X600 or equivalent), place 18-inch-thick compacted base material (CAB or equivalent) to bridge the soft bottom. Base should be compacted to 90% relative compaction. An additional layer of geofabric may be needed on top of base depending on the actual site conditions.

The actual depth of removal should be based on recommendations and observation made during grading. Therefore, some variations in the depth and lateral extent of over-excavation recommended in this report should be anticipated.

Site grading may result in transition lines with cut and/or fill conditions. This transition line would require special grading considerations. Detailed site grading recommendations are provided in the following sections.

9.3 Canyon Bottom Subdrains

Canyon bottom subdrain systems should be constructed of a minimum 6-inch diameter, Schedule 80 PVC pipe with glued manufactured pipe fitting and caps. The drain pipe should be sloped at a minimum 2% gradient to provide gravity flow to the approved outlet location. Perforated pipes shall be laid with perforations down. Schedule 80 PVC perforated pipe may have to be custom fabricated.

Surface drain systems should not be connected to the subdrain system. Introduction of surface water in the subdrain system could be recharge water into the compacted fill soils. Surface and subsurface drainage systems should be kept separate.

A State of California Department of Transportation (Caltrans) Class 2 Permeable Material is recommended for the permeable drain material. The percentage

composition by weight of permeable material in place shall conform to the following gradings:

Table No. 10, Caltrans Class 2 Permeable Material

Sieve Size	Percentage Passing
1”	100
¾”	90 - 100
3/8”	40 - 100
No. 4	25 – 40
No.8	18 – 33
No. 30	5 – 15
No. 50	0 – 7
No. 200	0 – 3

Note: Class 2 permeable material shall have a Sand Equivalent value of not less than 75.

9.4 Structural Fill

The approved bottom of the excavations should be scarified to a depth of at least six (6) inches. The scarified soils should be moisture conditioned to near-optimum moisture content and compacted to at least 90 percent of the laboratory maximum dry density to produce a firm and unyielding surface.

All structural fill should be placed on competent, scarified and compacted native materials as determined by a geotechnical engineer and in accordance with the specifications presented in this section. Excavated site soils, free of deleterious materials and rock fragments larger than three (3) inches in the largest dimension, should be suitable for placement as compacted fill. Any import fill should be tested and approved by Converse. The import fill should have an expansion potential less than 20.

Prior to compaction, fill materials should be thoroughly mixed and moisture conditioned when necessary, within three (3) percent of the optimum moisture for granular soils and at approximately three (3) percent above the optimum moisture for fine-grained soils. All fill, if not specified otherwise elsewhere in this report, should be compacted to at least 90 percent of the laboratory dry density in accordance with the ASTM Standard D1557 test method. The amount of processing required for proper moisture conditioning at the site will depend on the seasonal variations in the *in-situ* moisture conditions, the depth of cut, the equipment, and the processing method.

Fill exceeding five (5) feet in height shall not be placed on native slopes that are steeper than 5:1 horizontal:vertical (H:V). Where native slopes are steeper than 5:1 H:V, and the

height of the fill is greater than five (5) feet, the fill shall be keyed and benched into competent materials. The height and width of the benches shall be at least two (2) feet.

9.5 Excavatability

Based on our field exploration, the earth materials at the site should be excavatable with conventional heavy-duty earth moving and trenching equipment. The onsite materials contain about 5 to 30 percent gravels up to 3 inches in maximum dimension. Larger gravels, cobbles and possible boulders may exist at the site. The pebble conglomerate bedrock materials are cemented and moderately hard to hard. The excavation and rippability of this bedrock will be more difficult and should be anticipated during grading. Soil borings drilled for the project encountered difficult drilling and/or refusal in the conglomerate bedrock materials. Standard Penetration Tests (SPT) blow counts in the conglomerate bedrock materials were high and often times met refusal to sampler penetrations. Localized areas of very hard bedrock requiring very hard ripping should be anticipated. Directional ripping and downsizing breakers may be required in cemented sandstone and conglomerate beds. Earthwork should be performed with suitable equipments for gravelly materials.

9.6 Expansive Soil

Based on our laboratory testing results, the on-site clayey earth materials are considered to be very “low to high” expansion potential. Medium to high expansion potential materials may be anticipated. The on-site soil materials will be mixed during the grading and the expansion potential might change. Therefore, the expansion potential of site soils should be verified after the grading as slabs, foundations and pavement placed directly on expansive subgrade soil will likely crack over time.

To mitigate the expansive soils, on-site clayey soils with an Expansion Index higher than 20 should not be re-used for compaction within 2 feet below the proposed foundations or for retaining wall backfill. The extent of removal should be determined by the geotechnical representative based on soil observation during grading.

There are several alternative mitigation measures that can be utilized to improve expansive soils at the site. Some mitigation measures include:

- Pre-saturation of on-site compacted subgrade soils to at approximate three (3) percent above optimum moisture content.

- Removing about two (2) feet of the underlying soils throughout areas beneath structures and the track, and replacing with imported non-expansive sandy soil materials.

9.7 Pipeline Backfill Recommendations

Any soft and/or unsuitable material encountered at the pipe invert should be removed and replaced with an adequate bedding material. The pipe subgrade should be level, firm, uniform, free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than two (2) inches in the largest dimension, if any, should be removed from the trench bottom and replaced with compacted materials. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom for as near its full length as is practicable. The bedding zone is defined as that portion of the pipe trench from four inches below the pipe invert to one foot above the top of pipe, in accordance with Section 306-1.2.1 of the Latest Edition of the *Standard Specifications for Public Works Construction* (SSPWC).

9.8 Trench Zone Backfill

The following specifications are recommended to provide a basis for quality control during the placement of trench backfill.

Trench excavations to receive backfill shall be free of trash, debris or other unsatisfactory materials at the time of backfill placement. Excavated on-site soils free of oversize particles, defined as larger than one (1) inch in maximum dimension in the upper 12 inches of subgrade soils and larger than three (3) inches in the largest dimension in the trench backfill below, and deleterious matter after proper processing may be used to backfill the trench zone. Imported trench backfill, if used, should be approved by the project soils consultant prior to delivery at the site. No more than 30 percent of the backfill volume should be larger than ¾ inch in the largest dimension.

Trench backfill shall be compacted to 90 percent of the laboratory maximum dry density as per ASTM Standard D1557 test method. At least the upper twelve (12) inches of trench underlying pavements should be compacted to at least 95 percent of the laboratory maximum dry density.

Trench backfill shall be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers, or mechanical tampers, to achieve the density specified herein. The backfill materials shall be brought to within two (2) percent of optimum moisture content and then placed in horizontal layers if the expansion index is less than or equal to 30. Should the expansion index be greater than 30, backfill materials shall be brought to approximately 2 percent above optimum moisture content. The thickness of uncompacted layers should not exceed eight (8) inches. Each layer shall be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.

The contractor shall select the equipment and processes to be used to achieve the specified density without damage to adjacent ground and completed work. The field density of the compacted soil shall be measured by the ASTM Standard D1556 or ASTM Standard D2922 test methods or equivalent. Observation and field tests should be performed by Converse during construction to confirm that the required degree of compaction has been obtained. Where compaction is less than that specified, additional compactive effort shall be made with adjustment of the moisture content as necessary, until the specified compaction is obtained. It should be the responsibility of the contractor to maintain safe conditions during cut and/or fill operations. Trench backfill shall not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are as previously specified.

Imported soils, if any, used as compacted trench backfill should be predominantly granular and meet the following criteria:

- Expansion Index less than 20
- Free of all deleterious materials
- Contain no particles larger than 3 inches in the largest dimension
- Contain less than 30 percent by weight retained on ¾-inch sieve
- Contain less than 15 percent fines (passing #200 sieve)
- Have a Plasticity Index of 10 or less

Any import fill should be tested and approved by the geotechnical representative prior to delivery to the site.

9.9 Shrinkage and Subsidence

The shrinkage and/or bulkage would depend on, among other factors, the depth of cut and/or fill, and the grading method and equipment utilized. For preliminary estimation, bulking and shrinkage factors for various units of earth material at the site may be taken as presented below:

- The approximate shrinkage factor for the upper ten (10) feet of alluvial soils is estimated to range from ten (10) to twenty (20) percent.
- Subsidence would depend on the construction methods including type of equipment utilized. For estimation purposes, ground subsidence may be taken as 0.20 feet.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

9.10 Subgrade Preparation

Final subgrade soils for structures and streets should be uniform and non-yielding. To obtain a uniform subgrade, soils should be well mixed and uniformly compacted. The subgrade soils should be non-expansive and well-drained. The near-surface site soils should be free draining. We recommend that at least the upper two (2) inches of subgrade soils underneath the slab-on-grade should be comprised of well-drained granular soils such as sands, gravel or crushed aggregate satisfying the following criteria:

- Maximum size $\leq$ 1.5 inches
- Percent passing U.S. #200 sieve $\leq$ 12 percent
- Sand equivalent $\geq$ 30

The subgrade soils should be moisture conditioned before placing concrete.

The various design recommendations provided in this section are based on the assumptions that in preparing the site, the earthwork and site grading recommendations provided in this report will be followed. The proposed buildings may be supported by shallow continuous and isolated square footings.

10.0 DESIGN RECOMMENDATIONS

10.1 Shallow Foundations

10.1.1 Vertical Capacity

Continuous and square footings should be founded at least 24 inches below lowest adjacent final grade on the recommended earth materials. A minimum footing width of 24 inches is recommended for continuous and square footings. The net allowable dead plus live load bearing value for isolated square and continuous footings is 3,000 psf. The net allowable bearing pressure can be increased by 400 psf for each additional foot of excavation depth and width up to a maximum value of 5,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity.

10.1.2 Lateral Capacity

Resistance to lateral loads can be provided by friction acting at the base of the foundation and by passive earth pressure. A coefficient of friction of 0.35 may be assumed with normal dead load forces. An allowable passive earth pressure of 300 psf per foot of depth up to a maximum of 3,000 psf may be used for footings poured

against properly compacted fill or undisturbed stiff natural soils. The values of coefficient of friction and allowable passive earth pressure include a factor of safety of 1.5.

10.1.3 Settlement

The static settlement of structures supported on continuous and/or spread footings founded on compacted fill will depend on the actual footing dimensions and the imposed vertical loads. Most of the footing settlement at the project site is expected to occur immediately after the application of the load. Based on the maximum allowable net bearing pressures presented above, static settlement is anticipated to be less than 1.0 inch. Differential settlement is expected to be up to one-half of the total settlement over a 30 foot span.

10.1.4 Dynamic Increases

Bearing values indicated above are for total dead load and frequently applied live loads. The above vertical bearing may be increased by 33% for short durations of loading which will include the effect of wind or seismic forces. The allowable passive pressure may be increased by 33% for lateral loading due to wind or seismic forces.

10.2 Pier Foundations

The planned cantilever light poles, pedestrian bridge and retaining walls can be supported on piers (caissons) provided the following recommendations incorporated into design and construction. The piers can be connected to a grade beam system determined by the project structural engineer to control the deflections of structure under the design tolerance.

10.2.1 Vertical Capacity

Piers should be at least 24-inch in diameter extending at least 8 feet below adjacent final grade on compacted fill or native alluvial soils. Piers can be designed for an allowable skin friction of 250 psf against the perimeter of pier for a minimum embedment of 8 feet below the adjacent grade or depth of fill, whichever is greater. Furthermore, sonotubes should be used for the depth of the installed piers equal to that of the depth of fill. The soil skin friction associated with the depth of installed sonotubes should be neglected in pier capacity calculations.

If end bearing capacity is to be considered for design, the bottom of pier should be cleaned out with appropriate equipment. The allowable end bearing capacity can be designed for 3,500 psf. However, the diameter of pier may be increased and temporary casing may be required to facilitate cleanout.

10.2.2 Lateral Capacity

Resistance to lateral loads can be provided by friction acting at the base of the foundation and by passive earth pressure. A coefficient of friction of 0.35 may be assumed with normal dead load forces. An allowable passive earth pressure of 300 psf per foot of depth up to a maximum of 3,000 psf may be used for foundations poured against compacted fill. The values of coefficient of friction and allowable passive earth pressure include a factor of safety of 1.5. For ground surface restrained by concrete slab, the passive resistance may be calculated from the ground surface. For unrestrained ground condition, the passive resistance of the upper one (1) feet earth material should be neglected in design.

10.2.3 Settlement

The static settlement of structures supported on piers founded on native alluvium will depend on the actual footing dimensions and the imposed vertical loads. Most of the footing settlement at the project site is expected to occur immediately after the application of the load. Based on the maximum allowable net bearing pressures presented above, static settlement is anticipated to be less than 0.5 inch.

10.2.4 Dynamic Increases

Bearing values indicated above are for total dead load and frequently applied live loads. The above vertical bearing may be increased by 33% for short durations of loading which will include the effect of wind or seismic forces. The allowable passive pressure may be increased by 33% for lateral loading due to wind or seismic forces.

10.3 Cast-In-Drilled-Hole (CIDH) Piles

Cast-In-Drilled-Hole (CIDH) piles deriving their capacities primarily from the skin friction may be used for support of the Gateway Building.

Pile drilling and concrete placement should be performed in accordance with the recommendations presented herein and in the Appendix G, *Guide Specifications for Drilled Pile Installation* and the Standards and Specifications of ADSC: An International Association of Foundation Drilling Contractors.

The drilling for piles should not be performed adjacent to recently excavated or recently poured piles until the concrete in the completed piles has been allowed to set for several hours. The minimum recommended spacing between adjacent pours may be taken as 6 times the pile diameters. Piles in groups should be drilled and poured in an alternating sequence to minimize the potential for fresh concrete flowing into adjacent open pile excavations.

Drilling of pile shafts should be observed by the Geotechnical Consultant to confirm that piles are extended to the proper depth and that material encountered is similar to that encountered in the borings drilled for this study. Pile lengths should be tabulated in the foundation plans based upon the embedment below the bottom of the pile cap or other point of reference that can be established in the field during construction.

10.3.1 Axial Pile Capacity

The CIDH piles should be at least 18-inch in diameter extending to at least 3 feet into native alluvial soils or compacted fill, and can be designed for an allowable skin friction of 200 psf. The diameter and length of pile shall be determined by the project structural engineer based on the design loads. The piles can be connected to grade beams, determined by structural engineer, to control the deflections under the design tolerance. For the Gateway building areas located within relatively deep undocumented fill areas, over-excavation and compaction is not feasible, we recommend CIDH pile extend at least 7 feet below the fill and install sonotube to the depth of undocumented fill to isolate the pile for potential settlement of fills.

A factor of safety of 2.0 has been applied to obtain the allowable values from the ultimate capacities. The Uplift capacities can be taken as one-half of compressive capacities for pile design. In order to eliminate reductions in capacities due to group efficiency and problems in construction, the minimum pile spacing, if any, should be 3 diameters on center.

Settlement of single piles designed and constructed in accordance with the recommendations presented herein is estimated to be less than 0.5 inch. Actual settlement would depend on the applied loads. Pile group settlement would depend on pile spacing, diameter, number of piles and/or the minimum dimensions of the pile group cap.

The allowable capacities may be increased by one-third for short-term transient loads, including wind or seismic forces. Short term uplift capacities can be assumed to be equal to half of the short term downward friction capacities.

10.3.2 Lateral Pile Capacity

The allowable passive earth pressure in terms of equivalent fluid pressure of 300 pcf for bedrock up to a maximum of 3,000 psf can be used for lateral design. The value of allowable passive earth pressure includes a factor of safety of 1.5. The passive pressure can be doubled if the pile spacing is greater than 3 times pile diameter.

10.4 Modulus of Subgrade Reaction

For the subject project, design of the structures supported on compacted fill subgrade prepared in accordance with the recommendations provided in this report may be based on a soil modulus of subgrade reaction of (k_s) of 150 pounds per square inch per inch.

10.5 Lateral Earth Pressure

The proposed retaining walls are anticipated to be up to 17 feet in height. The earth pressure behind any buried wall depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall inclination, surcharges, and any hydrostatic pressure. The following fluid pressures are recommended for vertical walls with no hydrostatic pressure, no surcharge, and level backfill.

Table No. 11, Lateral Earth Pressures for Retaining Wall Design

Backfill Slope (H:V)	Cantilever Wall Equivalent Fluid Pressure (pcf)	Restrained Wall Equivalent Fluid Pressure (psf)
Level	30 (triangular pressure distribution)	50 (triangular pressure distribution)

The recommended lateral pressures assume that the walls are fully back-drained to prevent build-up of hydrostatic pressure. Adequate drainage could be provided by means of permeable drainage materials wrapped in filter fabric installed behind the walls. The drainage system should consist of perforated pipe surrounded by a minimum one (1) square feet per lineal feet of free draining, uniformly graded, ¾ -inch washed, crushed aggregate, and wrapped in filter fabric such as Mirafi 140N or equivalent. The filter fabric should overlap approximately 12 inches or more at the joints. The subdrain pipe should consist of perforated, four-inch diameter, rigid ABS (SDR-35) or PVC A-2000, or equivalent, with perforations placed down. Alternatively, a prefabricated drainage composite system such as the Miradrain G100N or equivalent can be used. The subdrain should be connected to solid pipe outlets, with a maximum outlet spacing of 100 feet. Waterproofing membranes should be added to the subterranean wall levels for moisture sensitive areas to mitigate moisture migration through the walls.

In addition, walls with inclined backfill should be designed for an additional equivalent fluid pressure of one (1) pound per cubic foot for every two (2) degrees of slope inclination. Walls subjected to surcharge loads located within a distance equal to the height of the wall should be designed for an additional uniform lateral pressure equal to one-third or one-half the anticipated surcharge load for unrestrained or restrained walls, respectively. These values are applicable for backfill placed between the wall stem and an imaginary plane rising 45 degrees from below the edge (heel) of the wall footings.

Retaining walls taller than 6 feet should be designed to resist additional earth pressure caused by seismic ground shaking based on Section 1615A.1.6 of CBC 2010. A seismic earth pressure of 16H (psf), based on an inverted triangular distribution, can be used for design of wall.

10.6 Slabs-on-grade

Slabs-on-grade should have a minimum thickness of four inches for support of nominal ground-floor live loads without hydrostatic uplift pressures. Minimum reinforcement for slabs-on-grade should be No. 3 reinforcing bars, spaced at 18-inches on-center each way. The thickness and reinforcement of more heavily-loaded slabs will be dependent upon the anticipated loads and should be designed by a structural engineer.

Slabs should be designed and constructed as promulgated by the American Concrete Institute (ACI) and the Portland Cement Association (PCA). Prior to the slab pour, all utility trenches should be properly backfilled and compacted. Care should be taken during concrete placement to avoid slab curling.

In areas where a moisture-sensitive floor covering (such as vinyl tile or carpet) is used, slabs should be protected by at least a 10-mil-thick moisture barrier between the slab and compacted subgrade that meets the performance criteria of ASTM E 1745 Class A material. Polyethylene sheets should be overlapped a minimum of six inches, and should be taped or otherwise sealed.

10.7 Soil Corrosivity Evaluation

Based on our review of soil corrosivity test results (see Appendix B), the soluble sulfate concentration, pH, and chloride content are not in the corrosive range to concrete In accordance with the Caltrans Corrosive Guidelines (2012). However, the minimum saturated resistivity is in the corrosive range to ferrous metal. Protections of underground metal pipe should be considered. Since the soluble sulfate concentrations tested for this project are less than 2,000 ppm in the soil, mitigation measures to protect concrete in contact with the soils are not anticipated. Type I or II Portland Cement may be used for the construction of the foundations and slabs.

The test results presented herein are considered preliminary. Additional testing and evaluation of the as-graded soils is recommended. A corrosion engineer may be consulted for appropriate mitigation procedures and construction design, if needed. Conventional corrosion mitigation measures may include the following:

- Steel and wire concrete reinforcement should have at least three inches of concrete cover where cast against soil, unformed. Below-grade ferrous metals should be given a high-quality protective coating, such as 18-mil plastic tape, extruded polyethylene, coal-tar enamel, or Portland cement mortar.

- Below-grade metals should be electrically insulated (isolated) from above-grade metals by means of dielectric fittings in ferrous utilities and/or exposed metal structures breaking grade.

10.8 Flexible Pavement

The flexible pavement structural section design recommendations were performed in accordance with the method contained in the *CALTRANS Highway Design Manual*, Chapter 630 without the factor of safety. No specific traffic study was performed to determine the Traffic Index (TI) for the proposed project, therefore a wide range of TI values were evaluated.

Due to various earth materials encountered at the site, flexible pavement structural section recommendations are prepared for both subgrade soils. We recommend that the project structural engineer consider the traffic loading conditions at various locations and select the appropriate pavement sections from the following table:

Table No. 12, Flexible Pavement Structural Sections

Design R-value	Design TI	Asphalt Concrete (AC) Over Aggregate Base (AB) Structural Sections		Full AC Structural Section
		AC (inches)	AB (inches)	AC (inches)
12	4	3.0	5	5
	5	4.0	6.5	6.5
	6	5.0	8	8
	7	6.0	10	9.5
	8	7.0	11.5	11
	9	8.0	13	12.5

Base material shall conform to requirements for Crushed Miscellaneous Base (CMB) or equivalent and should be placed in accordance with the requirements of the Standard Specifications for Public Works Construction (SSPWC, latest Edition).

Asphaltic materials should conform to Section 203-1, "Paving Asphalt," of the Standard Specifications for Public Works Construction (SSPWC, latest Edition) and should be placed in accordance with Section 302-5, "Asphalt Concrete Pavement," of the SSPWC, 2012 edition.

Positive drainage should be provided away from all pavement areas to prevent seepage of surface and/or subsurface water into the pavement base and/or subgrade.

10.9 Rigid Pavement

Rigid pavement design recommendations were provided in accordance with the Portland Cement Association's (PCA) Southwest Region Publication P-14, *Portland Cement Concrete Pavement (PCCP) for Light, Medium, and Heavy Traffic*. We recommend that the project structural engineer consider the loading conditions at various locations and select the appropriate pavement sections from the following table:

Table No. 13, Rigid Pavement Structural Sections

Design R-Value	Design Traffic Index (TI)	PCCP Pavement Section (inches)
12	4.5	7.00
	5.0	7.25
	6.0	7.50
	7.0	7.75
	8.0	8.00
	9.0	8.25

The pavement sections presented in the table are based on a minimum 28-day Modulus of Rupture (M-R) of 550 psi and a compressive strength of 3,000 psi. The third point method of testing beams should be used to evaluate modulus of rupture. The concrete mix design should contain a minimum cement content of 5.5 sacks per cubic yard. Recommended maximum and minimum values of slump for pavement concrete are three (3) inches and one (1) inch, respectively.

Transverse contraction joints should not be spaced more than 15 feet and should be cut to a depth of ¼ the thickness of the slab. Longitudinal joints should not be spaced more than 12 feet apart. A longitudinal joint is not necessary in the pavement adjacent to the curb and gutter section.

All outside edges should conform to Section 201 of the Standard Specifications for Public Works Construction (SSPWC, latest edition), and should be constructed in accordance with Section 302-6 of the SSPWC. Pavement subgrade should be prepared in accordance with Section 9.7 of this report.

The PCCP materials should conform to Section 201 of the Specifications for Public Works Construction and should be constructed in accordance with Section 302-6 of the SSPWC.

Positive drainage should be provided away from all pavement areas to prevent seepage of surface and/or subsurface water into the pavement base and/or subgrade.

10.10 Site Drainage

Adequate positive drainage should be provided away from the structures to prevent ponding and to reduce percolation of water into structural backfill. We recommend that the landscape area immediately adjacent to the foundation shall be designed sloped away from the building with a minimum 5% slope gradient for at least 10 feet measured perpendicular to the face of the wall. Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building per 2013 CBC.

Planters and landscaped areas adjacent to the building perimeter should be designed to minimize water infiltration into the subgrade soils. Gutters and downspouts should be installed on the roof, and runoff should be directed to the storm drain through non-erosive devices. Lower level walkways and open patio areas may require special drainage provisions and sump pumps to provide suitable drainage.

11.0 CONSTRUCTION RECOMMENDATIONS

11.1 General

Site soils should be excavatable using conventional heavy-duty excavating equipment. Temporary sloped excavation is feasible if performed in accordance with the slope ratios provided in Section 11.2, *Temporary Excavations*. Existing utilities should be accurately located and either protected or removed as required. For steeper temporary construction slopes or deeper excavations, shoring should be provided by the contractor as necessary, to protect the workers in the excavation.

11.2 Temporary Excavations

Based on the materials encountered in the exploratory borings, sloped temporary excavations may be constructed according to the slope ratios presented in Table No. 14, *Slope Ratios for Temporary Excavation*. Any loose utility trench backfill or other fill encountered in excavations will be less stable than the native soils. Temporary cuts encountering loose fill or loose dry sand may have to be constructed at a flatter gradient than presented in the following table:

Table No. 14, Slope Ratios for Temporary Excavation

Maximum Depth of Cut (feet)	Maximum Slope Ratio* (horizontal: vertical)
0 – 5	vertical
5 – 10	1:1
10 +	1.5:1

*Slope ratio assumed to be uniform from top to toe of slope.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction, should not be placed within five (5) feet of the unsupported trench edge. The above maximum slopes are based on a maximum height of six (6) feet of stockpiled soils placed at least five (5) feet from the trench edge.

For steeper temporary construction slopes or deeper excavations, shoring should be provided by the contractor as necessary, to protect the workers in the excavation.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act of 1987 and current amendments, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the project's geotechnical consultant. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

If the excavation occurs near existing structures, special construction considerations would be required during excavation to protect these existing structures during construction. The proposed excavation should not cause loss of bearing and/or lateral supports of the existing structures.

11.3 Shoring Design

Temporary shoring will be required for the recommended excavation due to space limitations and property line boundaries and because of nearby existing structures or facilities and traffic loading. Temporary shoring may consist of the use of a trench box (where feasible), or conventional soldier piles and lagging. Shoring should ultimately be designed by a qualified structural engineer considering the recommendations below in their final design and others which are applicable.

Drilled excavations for soldier piles, which are recommended to create the proposed 40 foot high excavation, may require the use of drilling fluids to prevent caving and to maintain an opened hole for pile installation. Casing may be needed if granular earth material is located behind the existing retaining wall.

11.3.1 Cantilevered Shoring

Cantilevered shoring systems may include soldier piles with lagging to maintain temporary support of vertical wall excavations. Shoring design must consider the support of adjacent underground utilities and/or structures, and should consider the effects of shoring deflection on supported improvements. Due to sandy nature of on site soils, some caving during the drilling of soldier-pile borings should be anticipated.

A soldier pile system will require continuous lagging to control caving and sloughing in the excavation between soldier piles.

Temporary cantilevered shoring should be designed to resist a lateral earth pressure equivalent to a fluid density of 32 pounds per cubic foot (pcf) for non-surcharged condition. This pressure is valid only for shoring retaining level ground. This equivalent fluid pressure is valid only for shoring supporting level ground.

In addition to the lateral earth pressure, surcharge pressures due to miscellaneous loads, such as soil stockpiles, vehicular traffic or construction equipment located adjacent to the shoring, should be included in the design of the shoring. A uniform lateral pressure of 100 psf should be included in the upper 10 feet of the shoring to account for normal vehicular and construction traffic within 10 feet of the trench excavation. Surcharge pressures from the existing structures should be added to the above earth pressures for surcharges within a horizontal distance less than or equal to the wall height. Surcharge coefficients of 50% of any uniform vertical surcharge should be added as a horizontal earth pressure for shoring design. All shoring should be designed and installed in accordance with state and federal safety regulations.

The minimum embedment depth for piles is ten (10) feet from the lowest adjacent grade into firm alluvium, below the bottom of the excavation. Vertical skin friction against soldier piles for may be taken as 350 psf. Fixity may be assumed at two (2) feet below the excavation into firm native alluvium or bedrock. For the design of soldier piles spaced at least 3.0 diameters on-center, the passive resistance of the soils adjacent to the piles may be assumed to be 300 psf per foot of embedment depth. Soldier pile members placed in drilled holes should be properly backfilled with a sand/cement slurry or lean concrete in order to develop the required passive resistance.

Caving soils should be anticipated between the piles. To limit local sloughing, caving soils can be supported by continuous lagging or guniting. The lagging between the soldier piles may consist of pressure-treated wood members or solid steel sheets. In our opinion, steel sheeting is expected to be more expedient than wood lagging to install. Although soldier piles and any bracing used should be designed for the full-anticipated earth pressures and surcharge pressures, the pressures on the lagging are less because of the effect of arching between the soldier piles. Accordingly, the lagging between the piles may be designed for a nominal pressure of up to a maximum of 350 psf. All lumber to be left in the ground should be treated in accordance with Section 204-2 of the "Standard Specifications for Public Works Construction" (Latest Edition).

11.3.2 Tie-Back Shoring

A tie-back soldier-pile shoring system may be used to maintain temporary support of deep vertical walled excavations. Braced or tied-back shoring, retaining a level ground

surface, should be designed for a uniform pressure of 20H psf, where H is the height of the retained cut in feet.

Surcharge pressures should be added to this earth pressure for surcharges within a distance from the top of the shoring less than or equal to the shoring height. A surcharge coefficient of 50 percent of any uniform vertical surcharge should be added as a horizontal shoring pressure for braced shoring. A uniform lateral pressure of 100 psf should be included in the upper 10 feet of the shoring to account for normal vehicular and construction traffic within 10 feet of the trench excavation.

11.3.3 Tie-Backs

For design of tie-back shoring, it should be assumed that the potential wedge of failure is determined by a plane at 30 degrees from the vertical, through the bottom of the excavation. Tie-back anchors may be installed at angles of 15 to 40 degrees below a horizontal plane. Tie-back installation and testing guidelines and procedures are presented in Appendix F, *"Guide Specifications for Installation and Acceptance of Tie-back Anchors".* Soil friction values, for estimating the allowable capacity of drilled friction anchors, may be computed using the following equation:

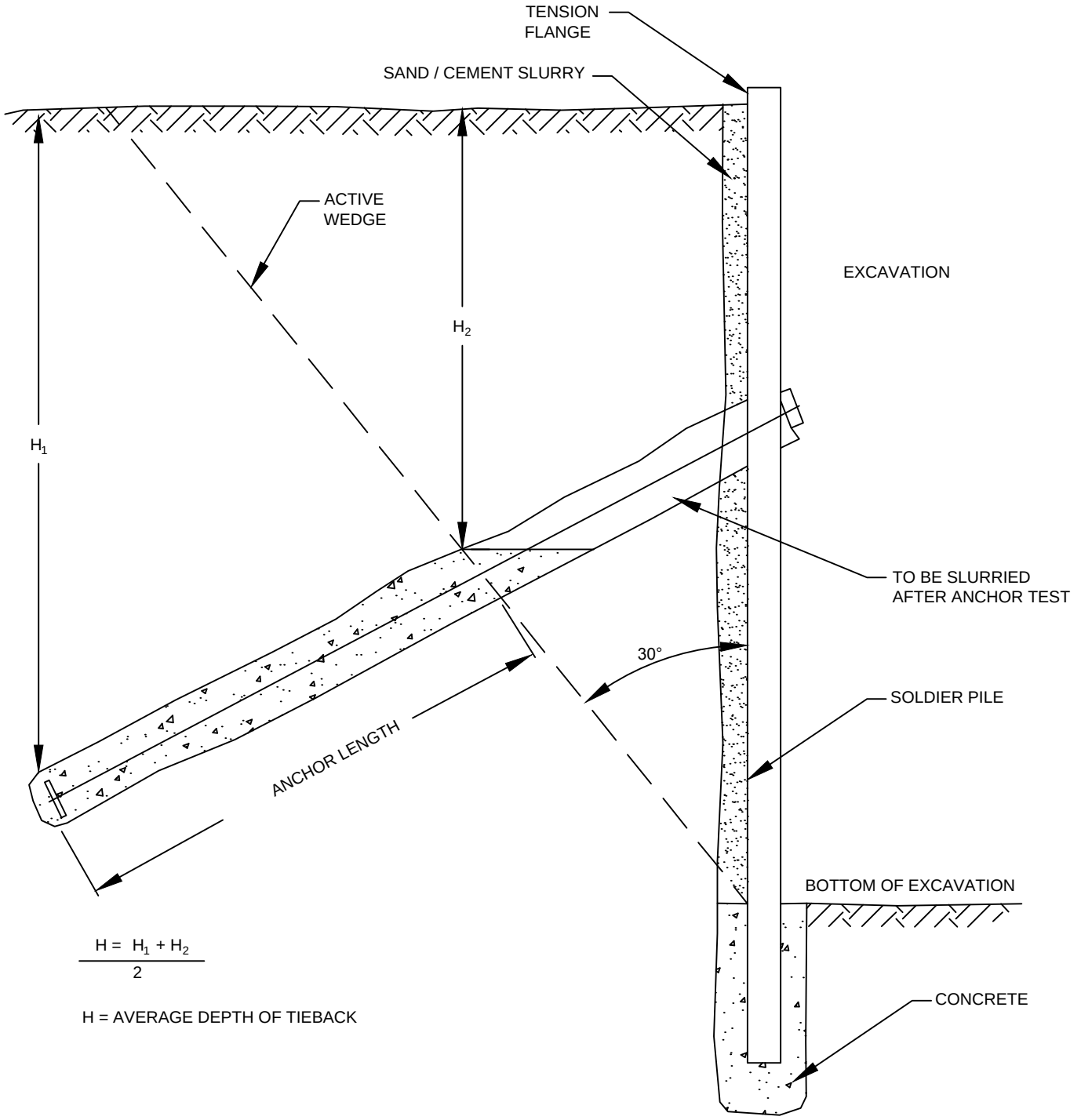
$q = 40H$; $q \leq$ *500 pounds-per-square-foot (psf)*

where:
H = average depth of anchor below ground surface, shown on Drawing No. 9, *Schematic Tie-Back Design*
q = anchor surface area resistance, in psf (excluding tip),

Only the frictional resistance developed beyond the assumed failure plane should be included in the tie-back design for resisting lateral loads. After shoring/tie-back is no longer needed to support the excavation, stress should be carefully released and shoring system including tieback may be able to be left in place.

All shoring and tie-back should be designed by experienced California licensed Civil Engineer and installed by experienced contractors. Shoring/tie-back design should also be reviewed by a geotechnical consultant to verify the soil parameters used in the design are in conformance with geotechnical report.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act of 1987 and current amendments, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by a competent person employed by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.



$$H = \frac{H_1 + H_2}{2}$$

H = AVERAGE DEPTH OF TIEBACK

SCHEMATIC TIE-BACK DESIGN

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No.
13-31-284-01

Converse Consultants

Drawing No.
9

It is recommended that Converse review plans and specifications for proposed shoring and that a Converse representative observes the installation of shoring. A licensed surveyor should be retained to establish monuments on shoring and the surrounding ground prior to excavation. Such monuments should be monitored for horizontal and vertical movement during construction. Results of the monitoring program should be provided immediately to the project Structural (shoring) Engineer and Converse for review and evaluation. Adjacent building elements should be photo-documented prior to construction.

12.0 PLAN REVIEW AND CONSTRUCTION INSPECTION SERVICES

This report has been prepared to aid in evaluation of the site, to prepare site-grading recommendations, and to assist the civil/structural engineer in the design of the proposed developments. It is recommended that this office be provided the opportunity to provide final site grading and design recommendations once the final grading plan is available.

All site grading and earthwork should be completed under the observation and testing of a qualified geotechnical consultant to verify compliance with the recommendations set forth in this report. All ground surfaces should be examined and approved by the project geotechnical consultant prior to placing any fill and/or structure. All footing excavations should be observed prior to placement of steel and concrete to see that footings are founded on satisfactory soil and that excavations are free of loose, disturbed or deleterious materials.

13.0 CLOSURE

The findings and recommendations of this report were prepared in accordance with generally accepted professional engineering and engineering geologic principles and practice. We make no other warranty, either expressed or implied. Our conclusions and recommendations are based on the results of the field and laboratory investigations, combined with an interpolation and extrapolation of soil conditions between and beyond boring locations. If conditions encountered during construction appear to be different from those shown by the borings, this office should be notified.

Design recommendations given in this report are based on the assumption that the earthwork and site grading recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the final site grading and actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

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APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

Our field investigation included a site reconnaissance of the site and a subsurface exploration program consisting of drilling soil borings. During the site reconnaissance on March 18, 2013, the surface conditions were noted and the locations of the borings were determined. The borings were located using existing boundary features as a guide and should be considered accurate only to the degree implied by the method used.

Twenty-nine (29) borings (BH-1 through BH-29) were drilled from June 16 to 24 2013, extending between depths of approximately 10 to 61.5 feet below the existing ground surface (bgs). Sixteen (16) borings were also drilled within the project site from April 6 to April 15, 2013 as part of the Geotechnical Study Report for the Fill Placement for the Driving Range and Practice Field and Hilltop Removal for Future Physical Education Complex (2013) extending between depths of approximately 21.5 to 91.5 feet below the existing ground surface (bgs). The borings were drilled using a limited access track drill rig and truck-mounted drill rig equipped with an 8-inch diameter hollow-stem auger for soil sampling. Soils and bedrock were logged by a Converse engineer and classified in the field by visual examination in accordance with the Unified Soil Classification System. The field descriptions have been modified where appropriate to reflect the laboratory test results.

Ring samples of the subsurface materials were obtained at frequent intervals in the exploratory borings using a drive sampler (2.4-inches inside diameter and 3.0-inches outside diameter) lined with sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches, using an automatic hammer. Samples were retained in brass rings (2.4-inches inside diameter and 1.0-inch in height). The central portion of the sample was retained and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Blow counts for each sample interval are presented on the logs of borings. Bulk samples of typical soil types were also obtained.

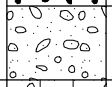
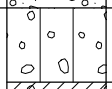
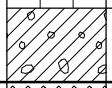
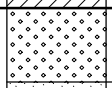
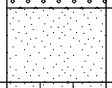
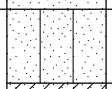
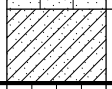
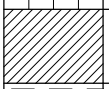
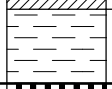
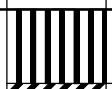
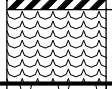
Standard Penetration Tests (SPT) were also performed using a standard (1.4-inches inside diameter and 2.0-inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, failing 30 inches for each blow. The recorded blow counts for every six inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings in the “BLOWS" column. The standard penetration test was performed in accordance with the ASTM Standard D1586 test method. The soil retrieved from the spoon sampler was carefully sealed in waterproof plastic containers for shipment to the laboratory.

Borings BH-22 and BH-29 were utilized for percolation tests prior to backfill. Percolation test procedures and test results are further discussed in report section 7.0, *Percolation*

Testing and Appendix D.

It should be noted that the exact depths at which material changes occur cannot always be established accurately. Changes in material conditions that occur between driven samples are indicated in the logs at the top of the next drive sample. A key to soil symbols and terms is presented as Drawing No. A-1, *Soil Classification Chart*. The logs of the exploratory boring are presented in Drawing Nos. *A-2 through A-30*, *Log of Borings*.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO 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 (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR 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 GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE 2.42" I.D. sampler.
- DRIVE SAMPLE No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

LABORATORY TESTING ABBREVIATIONS

TEST TYPE
(Results shown in Appendix B)

CLASSIFICATION

Plasticity	pi
Grain Size Analysis	ma
Passing No. 200 Sieve	wa
Sand Equivalent	se
Expansion Index	ei
Compaction Curve	max
Hydrometer	h

STRENGTH

Pocket Penetrometer	p
Direct Shear	ds
Direct Shear (single point)	ds*
Unconfined Compression	uc
Triaxial Compression	tx
Vane Shear	vs
Consolidation	c
Collapse Test	col
Resistance (R) Value	r
Chemical Analysis	ca
Electrical Resistivity	er

UNIFIED SOIL CLASSIFICATION AND KEY TO BORING LOG SYMBOLS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-1**

Log of Boring No. BH- 1

Dates Drilled: 6/18/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 733 Depth to Water (ft): 17.2

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		6" ASPHALT CONCRETE OVER 3" BASE						
		FILL (Af): **CLAY (CL):** trace of silt and fine-grained sand, dark brown.						ei,wa (fc=80%)
		SANDY CLAY (CL): fine to medium-grained sand, some silt, olive.						
5			■		7/8/12	32	85	
		ALLUVIUM (Qal): **CLAY (CL):** trace of fine to medium-grained sand and silt, whitish, yellow-brown.						
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** moderately weathered, near vertical bedding, orangish brown/olive.	■		6/14/20	31	85	ds
15		-45° approximate bedding, thinly bedded	■		14/17/21	37	81	
20		-dark brown	⊠		9/16/17			
25			■		21/42/46	42	79	
		End of boring at 26.5 feet. Groundwater encountered at 17.2 feet during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-18-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-2**

Log of Boring No. BH- 2

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 740 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		FILL (Af): **CLAY (CL):** trace of fine-grained sand, some silt, dark brown.		■				ca,er
5			■		8/12/19	24	99	
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** moderately weathered, no apparent bedding, orangish brown/olive.	■		15/19/23	39	84	
15			■		12/17/22	28	89	
20			☒		9/10/12			
		End of boring at 21.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-3**

Log of Boring No. BH- 3

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 769 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **CLAY (CL):** trace fo fine-grained sand, some silt, brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** moderately weathered, near vertical bedding, pockets of caliche, orangish brown, gray.	■		3/18/35	28	87	
10		-45° bedding, orange, gray, trace caliche white	■		8/20/27	14	94	
15			☒		14/19/23			
20		-near vertical bedding, trace caliche, orange gray	■		22/15/20	14	98	
		End of boring at 21.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-4**

Log of Boring No. BH- 4

Dates Drilled: 6/20/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 777 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		3" ASPHALT CONCRETE OVER 1.5" BASE						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, CLAYSTONE AND SANDSTONE:** lightly weathered, 45° bedding, pockeets of caliche, light gray/gray, orangish brown						
5			■		17/32/39	18	98	
10		-45° bedding, lightly weathered, dark brown, gray, light gray	■		7/22/30	30	85	
15			■		14/19/36	24	92	
20			☒		7/9/10			
25		-near vertical bedding, moderately weathered, thinly bedded	■		11/24/50(5")	30	96	
30			☒		9/13/15			

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-5a**

Log of Boring No. BH- 4

Dates Drilled: 6/20/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 777 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, CLAYSTONE AND SANDSTONE:** moderately weathered, thinly bedded.	■		10/24/35	29	89	
40			☒		9/11/12			
45		-thinly bedded, near vertical bedding, orange, orangish brown, gray, light gray	■		16/44/50(5")	16	99	
50			☒		15/16/20			
55			■		15/29/50(4.5")	28	94	
60			☒		11/14/16			
		End of boring at 61.5 feet. Groundwater encountered at 58.7 feet during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-20-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-5b**

Log of Boring No. BH- 5

Dates Drilled: 6/24/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 780 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2" ASPHALT CONCRETE OVER 2" BASE						
		ALLUVIUM (Qal): **SANDY SILT (ML):** fine to medium-grained sand, some clay, yellow brown.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE:** severely weathered, no apparent bedding, orange, gray brown, light gray			22/32/40	28	90	
5								
		-moderate weathering, approximately 45° bedding			19/50(6")	20	92	
10								
					13/16/21			
15								
		-thinly bedded			23/50(6")	32	89	
20								
					11/13/22			
25								
					13/17/22			
30								

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-6a**

Log of Boring No. BH- 5

Dates Drilled: 6/24/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 780 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE:** severely weathered, orange, gray brown, light gray	X		16/17/16			
		End of boring at 36.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-25-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-6b**

Log of Boring No. BH- 6

Dates Drilled: 6/24/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 781 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2" ASPHALT WITH NO BASE						
		ALLUVIUM (Qal): **SANDY SILT (ML):** fine to coarse-grained sand, some clay, yellow brown.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SANDSTONE:** moderately weathered, thinly bedded, nearly vertical, orangish brown, gray, light gray						
5			■		10/30/35	26	123	
10			■		9/22/31	24	95	
15			■		27/36/45	29	90	
20		-approximately 45° bedding, lightly weathered	⊠		8/17/25			
25			■		30/50(5")			
30			⊠		12/12/16			

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-7a**

Log of Boring No. BH- 6

Dates Drilled: 6/24/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 781 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SANDSTONE:** moderately weathered, thinly bedded, orangish brown, gray, light gray	■		25/50(6")	30	85	
40		-pockets of caliche	☒		20/20/20			
45		-approximately 60° bedding, pockets of quartz	■		33/50(5")	30	86	ds
50			☒		7/14/18			
		End of boring at 51.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-24-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-7b**

Log of Boring No. BH- 7

Dates Drilled: 6/24/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 773 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2" ASPHALT WITH NO BASE						
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine to medium-grained, some clay, light brown.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE:** weathered, no apparent bedding, grayish brown, orangish brown, light brown.						
5			■		8/15/21	34	80	
10		-thinly bedded, near vertical bedding	■		13/40/45	20	89	
15			⊠		6/10/13			
20			■		7/19/27	30	86	
25			⊠		7/11/14			
30			■		11/24/38	35	82	
		End of boring at 31.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings and patched with asphalt concrete on 6-24-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-8**

Log of Boring No. BH- 8

Dates Drilled: 6/16/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 740 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		5" ASPHALT OVER 6" BASE						
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained, trace clay, light brown.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE:** weathered, no apparent bedding, grayish brown, orangish brown, light brown	■		14/22/37	21	90	ds
5								
		-thinly bedded, near vertical bedding	■		15/40/50(5")	18	96	
10								
			☒		10/17/25			
15		End of boring at 16.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-16-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-9**

Log of Boring No. BH- 9

Dates Drilled: 6/20/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 732 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **CLAY (CL):** trace fo fine-grained sand, some silt, brown.						ei
5		**ALLUVIUM (Qal):** **CLAY (CL):** trace of fine to medium-grained sand, some silt, dark brown.	■		8/14/22	27	94	
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, CLAYSTONE AND SANDSTONE:** moderately weathered, no apparent bedding, orangish brown, dark brown, gray, light gray.	■		5/14/20	24	91	
15			■		7/16/22	26	95	
20			☒		5/7/7			
25		-pockets of caliche	■		8/14/24	27	90	
30			☒		6/6/8			

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-10a**

Log of Boring No. BH- 9

Dates Drilled: 6/20/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 732 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, CLAYSTONE AND SANDSTONE:** moderately weathered, no apparent bedding, orangish brown, dark brown, gray, light gray.	■		16/31/34	36	84	
		End of boring at 37.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings on 6-16-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-10b**

Log of Boring No. BH-10

Dates Drilled: 6/16/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 725 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		4" ASPHALT OVER 6" BASE						ca,er
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained, trace of clay, gravels up to 1.5" in maximum dimension, few clays, light brown.						
5		**ALLUVIUM (Qa):** **SILTY SAND (SM):** fine to medium-grained, with clay, trace caliche, dark brown.	■		7/7/7	22	80	ds
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** weathered, no apparent bedding, light.	■		7/18/30	29	92	
15		-moderately weathered, near vertical bedding, thinly bedded, orangish brown, grayish brown, light brown	■		9/19/28	24	95	
20			■		19/26/48	24	92	
		End of boring at 21.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-16-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-11**

Log of Boring No. BH-11

Dates Drilled: 6/16/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 717 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3" ASPHALT OVER 9" BASE						
		FILL (Af): **CLAY (CL):** trace of fine to medium-grained sand, trace silt, dark gray.						
5		**SANDY CLAY (CL):** fine to coarse-grained sand, trace silt, few gravels up to 0.5" in maximum dimension, dark brown.	■		6/9/7	14	108	
10			■		44/21/8	12	95	
15		-native at the bottom	■		6/3/4	10	97	
		End of boring at 16.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-16-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-12**

Log of Boring No. BH-12

Dates Drilled: 6/16/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 718 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3" ASPHALT OVER 6" BASE						ca,er
		FILL (Af): **CLAY (CL):** trace of fine to medium-grained sand, some silt, few gravels up to 0.5" in maximum dimension, dark brown.						
5		**ALLUVIUM (Qa):** **CLAY (CL):** trace of fine-grained sand, trace of silt, caliche, dark brown.	■		5/14/18	19	101	ds
10			■		7/13/16	25	90	
		BEDROCK - PUENTE FORMATION (Tpss): **SANDSTONE AND SILTSTONE:** severly weathered, no apparent bedding, orangish brown, olive brown						
15			■		7/12/14	28	97	
20		-moderately weathered, thinly bedded, near vertical bedding, light grayish brown, orangish brown, light brown	■		17/28/36	30	76	
		End of boring at 21.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-16-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-13**

Log of Boring No. BH-13

Dates Drilled: 6/16/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 731 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		FILL (Af): **SANDY CLAY (CL):** fine to medium-grained sand, trace silt, dark brown. **SANDY CLAY (CL):** fine to medium-grained sand, trace silt, olive brown.		■				ca,er
5			■		5/10/10	30	85	
10		**SAND (SP):** fine to medium-grained, with silt and clay, greenish gray.	■		6/11/14	26	91	
15		**ALLUVIUM (Qa):** **CLAY (CL):** trace of fine-grained sand, trace of silt, dark gray.	■		4/4/6	31	87	
20			■		4/8/11	20	117	ds
25			⊠		4/7/10			
30			■		7/13/17	27	89	
		End of boring at 31.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings on 6-16-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-14**

Log of Boring No. BH-14

Dates Drilled: 6/17/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 732 Depth to Water (ft): 38

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained, olive. **CLAYEY SAND (SC):** fine to medium-grained, few gravels up to 1.5" in maximum dimension, gray brown.						
5			■		4/8/11	35	86	
		CLAY (CL): fine to coarse-grained, with few rocks with silt up to 1" in maximum dimension, gray brown.						
10			■		5/7/8	29	87	
		ALLUVIUM (Qal): **CLAY (CL):** trace of fine to coarse-grained sand, with silt, trace caliche, dark brown.						
15			■		3/4/5			
20			⊠		4/5/6			wa (fc=72%)
25			■		7/14/22	33	85	c
30			⊠		8/11/12			wa(fc=46%)

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-15a**

Log of Boring No. BH-14

Dates Drilled: 6/17/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 732 Depth to Water (ft): 38

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **CLAY (CL):** trace of fine to coarse-grained sand, with silt, dark brown.	■		2/6/9	31	91	c
40			☒		5/5/7			wa (fc=63%)
45			☒		6/4/7			
		CLAY (CL): trace of fine-grained sand, trace silt, brown.						
50		**SILTY SAND (SM):** fine to medium-grained, with clay, light brown.	☒		27/36/22			
		End of boring at 53 feet. Groundwater encountered at 38 feet during drilling. Borehole backfilled with soil cuttings on 6-17-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-15b**

Log of Boring No. BH-15

Dates Drilled: 6/17/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 731 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **SILTY SAND (SM):** fine to coarse-grained, olive brown.						
		ALLUVIUM (Qal): **CLAY (CL):** trace of fine to medium-grained sand, with silt, olive brown.						
5			■		10/5/8	31	86	
10			⊠		4/6/8			
15			■		4/10/17	27	87	c
20		**Fat CLAY (CH):** trace silt, dark brown.	■		10/15/21	27	90	pi
25			⊠		4/5/7			
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE:** moderately weathered, no apparent bedding, grayish brown, orange brown, light brown						
30			■		8/11/14	29	92	
		End of boring at 31.5 feet. Groundwater encountered at 38 feet during drilling. Borehole backfilled with soil cuttings on 6-17-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-16**

Log of Boring No. BH-16

Dates Drilled: 6/17/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 756 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **CLAY (CL):** trace of fine to coarse-grained sand and silt, with gravels up to 1" in maximum dimension, light gray.						ei,ca,er
5			■		16/33/43	17	91	
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE** no apparent bedding, moderately weathered, light gray.						
10		-trace caliche	■		15/32/50	21	121	
15			■		15/28/39	22	112	
20			■		17/30/48	23	113	
25		-near vertical bedding	⊠		9/13/16			
30			⊠		11/17/21			
		End of boring at 31.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings on 6-24-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-17**

Log of Boring No. BH-17

Dates Drilled: 6/17/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 750 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		ALLUVIUM (Qal): **SANDY SILT (ML):** fine to coarse-grained sand, yelllow brown.						max
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** moderate weathering, no apparent bedding, yellowish brown.	■		33/35/29	22	99	
10			■		19/28/41	20	97	
15			⊠		10/12/18			
20			⊠		18/16/21			
25			⊠		16/20/21			
30			⊠		11/16/18			

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-18a**

Log of Boring No. BH-17

Dates Drilled: 6/17/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 750 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND CLAYSTONE:** moderate weathering, no apparent bedding, yellowish brown	X		8/17/17			
40		-trace clay, near horizontal bedding	X		13/23/26			
45			X		11/15/16			
50			■		24/42/50(4.5")	38	105	
		End of boring at 51.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings on 6-17-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-18b**

Log of Boring No. BH-18

Dates Drilled: 6/18/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 751 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine to medium-grained, trace of clay, yellow.						
5			■		8/10/19	18	106	
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, SANDSTONE AND CLAYSTONE:** lightly weathered, 30° from horizontal bedding, with caliche, light gray, olive brown.	■		12/23/35	18	116	
15			■		18/26/35	11	126	
20		-severely weathered, no apparent bedding, orangish brown, olive brown to yellow brown	☒		13/20/29			
25		-moderate weathering, near vertical bedding, thinly bedded, olive, light gray to gray, trace caliche	■		34/50(4.5")	13	84	
30			☒		21/22/24			

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-19a**

Log of Boring No. BH-18

Dates Drilled: 6/18/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 751 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND CLAYSTONE:** lightly weathered, 30° from horizontal bedding, with caliche, light gray, olive brown.			15/35/47	27	85	
40		-few gravels up to 3/4" in maximum dimension, gray brown	X		12/17/22			
45			■		15/27/50(5.5")	32	94	
50			X		10/16/19			
		End of boring at 51.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-18-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-19b**

Log of Boring No. BH-19

Dates Drilled: 6/18/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 771 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		ALLUVIUM (Qal): **SILTY SAND (SM):** fine to coarse-grained, few rocks up to 3/4" in maximum dimension, yellow brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** severely weathered, thinly bedded at nearly horizontal, orangish brown, and light gray, red brown.	■		17/15/17	38	77	ds
10			■		16/26/32	19	91	
15			⊠		7/11/10			
20		-thinly bedded at approximately 30°, moderately weathered, orange brown, light gray	■		11/21/32	21	93	
25		-Siltstone, Sandstone, Claystone and Granite, Sandy Clay (CL) fine to coarse-grained, few rocks up to 3/4" in maximum dimension, gray brown	■		8/16/26			
30			▭		50(5")			
		End of boring at 31.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings on 6-18-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-20**

Log of Boring No. BH-20

Dates Drilled: 6/18/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 736 Depth to Water (ft): 23.25

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		2.5" ASPHALT COVER WITH 6" BASE						ei
		FILL (Af): **SANDY CLAY (CL):** fine to coarse-grained, trace silt, dark brown.						
5		-with gravels up to 3/4" in maximum dimension, brown			8/8/15	22	96	ds
10		**ALLUVIUM (Qal):** **CLAY (CL):** trace of fine-grained sand and silt, trace caliche, brown.			5/8/13	29	86	
15					3/5/6			
20					4/6/7	38	79	
25					4/6/7			
30		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** moderately weathered, bedding approximately 80° vertical, orangish brown and gray.			13/31/50	33	85	
		End of boring at 31.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-18-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-22**

Log of Boring No. BH-21

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 740 Depth to Water (ft): 30.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3" ASPHALT CONCRETE						
		FILL (Af): **CLAY (CL):** trace of fine to medium-grained sand and silt, dark brown.		■				
5		**ALLUVIUM (Qa):** **CLAY (CL):** trace of fine-grained sand and silt, dark brown.	■		8/8/11	13	110	c
10		**SANDY CLAY (CL):** fine to medium-grained sand, some silt, dark brown.	■		7/14/15	6	109	
15		**CLAY (CL):** trace of fine-grained sand and silt, trace caliche, dark brown.	■		6/9/14	28	94	
20			⊠		4/6/8			
25		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** moderately weathered, no apparent bedding, brown, orangish brown, gray	⊠		7/9/12			
30			⊠		10/10/14			
		End of boring at 31.5 feet. Groundwater encountered at 30.5 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-23**

Log of Boring No. BH-22

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 745 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3" ASPHALT CONCRETE WITH 3" BASE						wa (fc=83%)
		FILL (Af): **CLAY (CL):** trace of fine-grained sand and silt, dark gray.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE:** lightly weathered, near vertical bedding, orangish brown, olive gray.			4/10/14	31	84	
10					8/10/12	27	87	
		End of boring at 11.5 feet. Groundwater not encountered during drilling. Borehole utilized for percolation testing. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-24**

Log of Boring No. BH-23

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 742 Depth to Water (ft): 29.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3" ASPHALT CONCRETE WITH 3" BASE						max
		FILL (Af): **SANDY SILT (ML):** fine to coarse-grained sand, some gravels up to 1" in maximum dimension.						
5		**ALLUVIUM (Qa):** **CLAY (CL):** trace of fine-grained sand and silt, dark brown.			6/8/14	19	103	
10		**CLAY WITH SAND (CL):** fine to medium-grained sand, brown.			10/11/16	12	111	
15		**CLAY (CL):** trace of fine-grained sand and silt, trace caliche, brown.			6/10/22	24	95	c
20					6/9/8			
25		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** lightly weathered, near vertical bedding, orangish brown, olive gray			12/14/22	7	109	
30					14/17/17			

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-25a**

Log of Boring No. BH-23

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 742 Depth to Water (ft): 29.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND CLAYSTONE:** lightly weathered, near vertical bedding, orangish brown, olive gray	X		11/15/20			
		End of boring at 29.5 feet. Groundwater not encountered during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-25b**

Log of Boring No. BH-24

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 743 Depth to Water (ft): 17

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3.5" ASPHALT OVER 6" BASE						
		FILL (Af): **CLAY (CL):** trace of fine to medium-grained sand with silt, few rocks up to 1/2" in maximum dimension, dark brown.						ca,er
5		**ALLUVIUM (Qal):** **SILTY CLAY (CL):** trace of fine to medium-grained sand and silt, gravels between 3/8" to 3/4" in diameter, trace caliche, brown.			9/13/19	11	110	ds
10		**SILTY SAND (SM):** fine to coarse-grained, few gravels up to 1/2" in maximum diemension, dark brown.			4/8/10	11	100	
15		**CLAY (CL):** trace of fine-grained sand and silt, brown.			4/6/10			
20		**SANDY CLAY (CL):** fine to medium-grained sand, brown.			4/8/8	20	107	
25		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, CLAYSTONE AND SANDSTONE:** stiff layers of cemented clay, sandy clay with gravel, rocks up to 3/4" in maximum dimension, brown			31/25/30			
					19/20/22			
		End of boring at 29.5 feet due to refusal of stiff cemented layer. Groundwater encountered at 17 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-26**

Log of Boring No. BH-25

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 741 Depth to Water (ft): 28.8

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		2" ASPHALT OVER 5" BASE						ei
		FILL (Af): **CLAY WITH SAND (CL):** fine to medium-grained sand, some silt, dark brown.		■				
5		**ALLUVIUM (Qal):** **SANDY CLAY (CL):** fine to medium-grained sand, some silt, dark brown.	■		8/13/18	16	114	pi
10		**SILTY SAND (SM):** fine to coarse-grained, with rocks up to 3/4" in maximum dimension, trace clay, dark brown.	■		11/11/19	6	108	
15			⊠		3/5/9			
20			■		15/16/28	16	113	
25		**CLAYEY SAND (SC):** fine to coarse-grained, trace silt, some gravel, brown.	⊠		50(4")			
30		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** gray brown.	■		20/50(6")	33	81	
		End of boring at 31 feet. Groundwater encountered at 28.8 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-18-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-27**

Log of Boring No. BH-26

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 741 Depth to Water (ft): 17.9

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		2" ASPHALT CONCRETE OVER 3" BASE						
		FILL (Af): **CLAYEY SAND (SC):** medium to coarse-grained, brown.						
5			■		6/9/12	16	113	ds
10		**ALLUVIUM (Qal):** **CLAYEY SAND (SC):** fine to medium-grained, trace silt, brown.	■		13/23/34	12	118	wa (fc=21%)
15		**SILTY SAND (SM):** fine-grained, slightly gravelly, trace of clay, brown.	■		14/23/30	11	119	
20			⊠		20/13/20			wa (fc=17%)
25		**SILTY CLAY (CL):** trace of fine-grained sand and silt, brown.	■		14/19/21	34	80	
30			⊠		7/10/14			wa (fc=62%)

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-28a**

Log of Boring No. BH-26

Dates Drilled: 6/19/2014 Logged by: FM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 741 Depth to Water (ft): 17.9

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND CLAYSTONE:** thinly bedded, moderately weathered, gray brown	■		18/36/47	34	85	
40			☒		5/7/9			wa (fc=75%)
45			■		15/30/50	33	86	
50			☒		8/15/20			
		End of boring at 51.5 feet. Groundwater encountered at 17.9 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **A-28b**

Log of Boring No. BH-27

Dates Drilled: 6/19/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 746 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **SILTY CLAY (CL):** trace of fine-grained sand and silt, dark brown.						
5		**ALLUVIUM (Qal):** **CLAY (CL):** trace of fine-grained sand and silt, dark brown.	■		38/18/20	13	98	
		-few gravels up to 1.5" in maximum dimension, brown to light brown						
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND CLAYSTONE:** severly weathered, no apparent bedding, trace caliche, orangish brown, gray, olive	■		5/13/23	30	84	
15		-near vertical bedding, moderately weathered.	⊠		7/7/13			
20			■		7/18/25	33	89	
		End of boring at 21.5 feet. Groundwater encountered at 38 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-29**

Log of Boring No. BH-28

Dates Drilled: 6/18/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 742 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **SANDY SILT (ML):** fine to coarse-grained sand, trace clay, dark brown.						ma, max (fc=80%)
5		**ALLUVIUM (Qal):** **CLAY (CL):** trace of fine-grained sand and silt, gray brown.			5/9/14	28	96	
10					7/15/15	32	93	
15		**SANDY CLAY (CL):** fine to medium-grained, trace silt, pockets of caliche, olive brown.			5/7/9			
20					10/15/22	35	84	
		End of boring at 21.5 feet. Groundwater encountered at 38 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-30**

Log of Boring No. BH-29

Dates Drilled: 6/19/2014 Logged by: MM Checked By: WHC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 740 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		4" ASPHALT OVER 6" BASE						r
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained, light brown.						
		CLAYEY SAND (SC): fine to medium-grained, trace silt, orangish brown.						
5								
10		End of boring at 21.5 feet. Groundwater encountered at 38 feet during drilling. Borehole backfilled with soil cuttings, tamped and patched with asphalt 6-19-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE ATHLETICS COMPLEX EAST WALNUT, CALIFORNIA

Project No. **14-31-124-01** Drawing No. **A-31**

APPENDIX A-1

PREVIOUS FIELD EXPLORATION BORING LOGS (2013)

Log of Boring No. BH-B1

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 752 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with gravels up to 1" in maximum dimension, light brown.						max
5			■		9/16/13			
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE:** slightly to moderately weathered, near-vertical bedding (±90°), orange-brown, olive-brown.	■		19/19/30	29	91	c
15			⊠		4/7/10			
20		-slightly fractured, tight, contains gypsum crystals along fractures	■		13/20/32	36	84	
25			⊠		7/11/15			
		End of boring at 26.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-12-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-2

Log of Boring No. BH-B2

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 803 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with clays and gravels up to 1" in maximum dimension, light brown.						
5		-becomes gray, buff	■		10/11/16	19	81	
10		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, gray.	■		14/25/31	54	83	
15		-becomes olive-brown	☒		2/4/6			
20		-moderate bedding (±45°), becomes gray	■		10/21/28	27	92	
25			☒		5/8/12			
30			■		17/32/42	33	88	

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-3a

Log of Boring No. BH-B2

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 803 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE:** laminated, slightly to moderately weathered, gray.	X		8/11/15			
40			■		10/29/54	23	95	
45			X		5/12/15			
50			■		21/48/50	39	80	ds
		End of boring at 51.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-11-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-3b

Log of Boring No. BH-B3

Dates Drilled: 4/15/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 840 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with gravels up to 0.75" in maximum dimension, light brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, some caliche along fractures, moderate bedding (±45°), gray, light brown.			15/26/27	29	96	
10					8/17/27	36	83	
15		**SILTSTONE, SANDSTONE AND SHALE:** steep to near-vertical bedding (±70°), gray.			6/23/33	46	69	
20					4/8/9			
25		-near-vertical bedding (±90°)			7/18/38	55	71	
30		-becomes olive-brown			5/7/13			

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01 Drawing No.: A2-4a

Log of Boring No. BH-B3

Dates Drilled: 4/15/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 840 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, some caliche along fractures, moderate bedding (±45°), gray, light brown.	■		6/12/34	34	86	ds
40		**MUDSTONE:** weathered, massive, olive-brown	☒		3/5/9			
45		**SILTSTONE, SHALE AND SANDSTONE:** very thinly bedded, slightly weathered, moderate bedding (±45°), olive-brown and orangish-brown	■		10/23/25	37	84	
50			☒		10/20/29			
55			■		13/50(5")	29	90	
60			☒		6/10/16			
65		-becomes slightly fractured, gypsum crystals along fractures	■		11/26/50	34	88	

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-4b

Log of Boring No. BH-B3

Dates Drilled: 4/15/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 840 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly weathered, olive-brown, orangish-brown.	X		7/10/16			
		End of boring at 71.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-15-13.						

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01 Drawing No.: A2-4c

Log of Boring No. BH-B4

Dates Drilled: 4/15/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 841 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with gravels up to 1" in maximum dimension, light brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE:** laminated, slightly weathered to moderately weathered, moderate to steep bedding (±70°), gray-brown.			9/17/27	3	108	
10		**SHALE:** slightly fractured, caliche along fractures, near-vertical bedding, gray.			8/15/24	28	87	
15					16/28/32			
20		**SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, gray-brown.			9/16/27			
25		-becomes orange-brown			6/11/13			
30					7/11/14			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-5a

Log of Boring No. BH-B4

Dates Drilled: 4/15/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 841 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly weathered to moderately weathered, moderate to steep bedding (±70°), olive-brown.	X		5/8/10			
40			X		8/11/17			
45		-becomes orange-brown	X		12/17/28			
50		-becomes grayish brown	X		8/9/10			
55		-becomes orange-brown	X		9/12/17			
60			X		7/9/12			
65			X		11/15/16			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-5b

Log of Boring No. BH-B4

Dates Drilled: 4/15/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 841 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly weathered to moderately weathered, moderate to steep bedding (±70°), gray-brown.	X		9/11/16			
		End of boring at 71.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-12-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-5c

Log of Boring No. BH-B5

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 839 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with few clays and gravels up to 0.75" maximum dimension, light brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE** slightly fractured, slightly to moderately weathered, light gray	■		8/20/28	27	78	
10		-becomes light brown, near vertical-bedding (±90°)	■		10/36/50(5")	29	64	
15			■		8/19/38	33	83	ds
20		-becomes gray	☒		6/12/14			
25			☒		10/9/14			
30		-becomes slightly fractured, gypsum crystals along fractures, orange-brown	☒		5/11/15			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-6a

Log of Boring No. BH-B5

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 839 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly fractured, slightly to moderately weathered, light gray.	X		50(5")			
40			X		6/9/76			
45		-becomes gray	X		6/10/17			
50		-becomes olive-brown/orange-brown	X		5/10/15			
55			X		6/10/15			
60			X		10/17/25			
65			X		11/12/19			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-6b

Log of Boring No. BH-B5

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 839 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly fractured, slightly to moderately weathered, light gray.	X		5/6/14			
		End of boring at 71.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-12-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-6c

Log of Boring No. BH-B6

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 841 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with clays and gravels up to 1" in maximum dimension, light brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, SANDSTONE, AND SHALE:** laminated, slightly to moderately weathered, steep to near-vertical bedding (±70°), light gray, light brown			17/28/37	25	85	
10		-becomes slightly fractured, gray-brown			8/22/34	23	91	
15					11/23/37	26	91	
20					5/6/10			
25		-moderate bedding (±45°), gray-brown, orange-brown			8/17/28			
30					5/6/10			

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01 Drawing No.: A2-7a

Log of Boring No. BH-B6

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 841 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE, AND SHALE:** slightly fractured, gypsum crystals along fractures.	■		2/8/38	34	86	
40			☒		6/17/24			
45			■		16/50(5")			
50		-moderate bedding (±45°)	☒		11/13/20			
55			■		13/42/50(4")	26	92	
60								
65		-near-vertical bedding (±90°)	■		14/50(5")	34	85	ds

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01 Drawing No.: A2-7b

Log of Boring No. BH-B6

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 841 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE, AND SHALE:** laminated, slightly to moderately weathered, steep to near-vertical bedding (±70°), light gray, light brown	X		11/16/20			
		End of boring at 71.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-11-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-7c

Log of Boring No. BH-B7

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 823 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, light gray.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE SHALE AND SANDSTONE:** laminated, slightly to moderately weathered, light gray.	■		10/21/35	32	87	
10		**MUDSTONE:** fractured and recemented, massive, gypsum crystals along fractures, gray-brown.	■		14/24/36	34	90	
15		**SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, moderate bedding (±45°), gray-brown, orange-brown	■		5/24/27			
20			☒		6/11/15			
25		-slightly fractured, gypsum crystals along fractures	■		7/17/39	32	89	
30			☒		4/11/15			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-8a

Log of Boring No. BH-B7

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 823 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SHALE AND SANDSTONE:** very thinly bedded, slightly weathered, gray/orangish-brown.	X		13/10/14			
75		-steep to near-vertical bedding (±70°)	■		25/50(5")	34	82	ds
80			X		8/7/14			
		End of boring at 81.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-11-13.						

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01

Drawing No.: A2-8c

Log of Boring No. BH-B8

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 835 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, gravels up to 1" in maximum dimension, light brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, moderate bedding (±45°), gray-brown, olive-brown.	■		8/16/31	31	88	
10			■		11/22/32	30	91	
15		**MUDSTONE:** slightly to moderately weathered, massive, tight, gray	■		7/23/29	34	87	
20		**SILTSTONE AND SHALE:** laminated, slightly moderately weathered, moderate bedding (±45°), gray-brown, olive-brown	☒		3/9/8			
25			☒		11/13/15			
30			☒		5/8/8			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-9a

Log of Boring No. BH-B8

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 835 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, moderate bedding (±45°), gray-brown, olive-brown	X		10/13/17			
40			X		6/8/11			
45			X		9/9/14			
50			X		7/23/18			
55			X		10/15/17			
60		-becomes orange-brown	X		9/16/18			
65			X		9/14/20			

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01 Drawing No.: A2-9b

Log of Boring No. BH-B8

Dates Drilled: 4/11/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 835 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly to moderately weathered, moderate bedding (±45°), orange brown	X		11/16/21			
		End of boring at 71.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-11-13.						

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No. 13-31-116-01 Drawing No. A2-9c

Log of Boring No. BH-B9

Dates Drilled: 4/10/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 846 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		COLLUVIUM (Qcol): **SILTY SAND (SM):** fine to medium-grained, with clay and gravels up to 1" in maximum dimension, light brown.						
5		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, SANDSTONE AND SHALE:** laminated, slightly to moderately weathered, moderate bedding (±45°), olive-brown, orange-brown.			14/29/36	29	87	
10					13/30/35	36	83	
15		-becomes gray-brown, moderate to steep bedding (±50°)			5/8/13			
20					6/24/31	33	87	
25					4/9/17			
30		-becomes slightly fractured, gypsum crystals along fractures			13/14/22	34	86	

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01 Drawing No.: A2-10a

Log of Boring No. BH-B9

Dates Drilled: 4/10/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 846 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND SHALE:** laminated, slightly to moderately weathered, moderate bedding (±45°), olive-brown, orange-brown.	X		9/18/21			
40		**SHALE:** fractured and recemented, moderately weathered, gypsum crystals along fractures, gray-brown	■		10/21/38	34	87	
45			X		4/6/8			
50		**SILTSTONE AND SHALE:** laminated, slightly weathered, moderate bedding (±45°), gray-brown	■		19/42/50(5")	29	92	
55			X		6/20/24			
60			■		8/12/23	39	81	
65			X		3/10/22			

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-10b

Log of Boring No. BH-B9

Dates Drilled: 4/10/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 846 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE, SANDSTONE AND SHALE:** laminated, slightly to moderately weathered, steep to near-vertical bedding (±70°), orange-brown.	■		5/30/50(3")	34	91	
75			⊠		9/13/28			
80		-near-vertical bedding (±90°)	■		34/50(5")	33	88	
		End of boring at 81.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-10-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

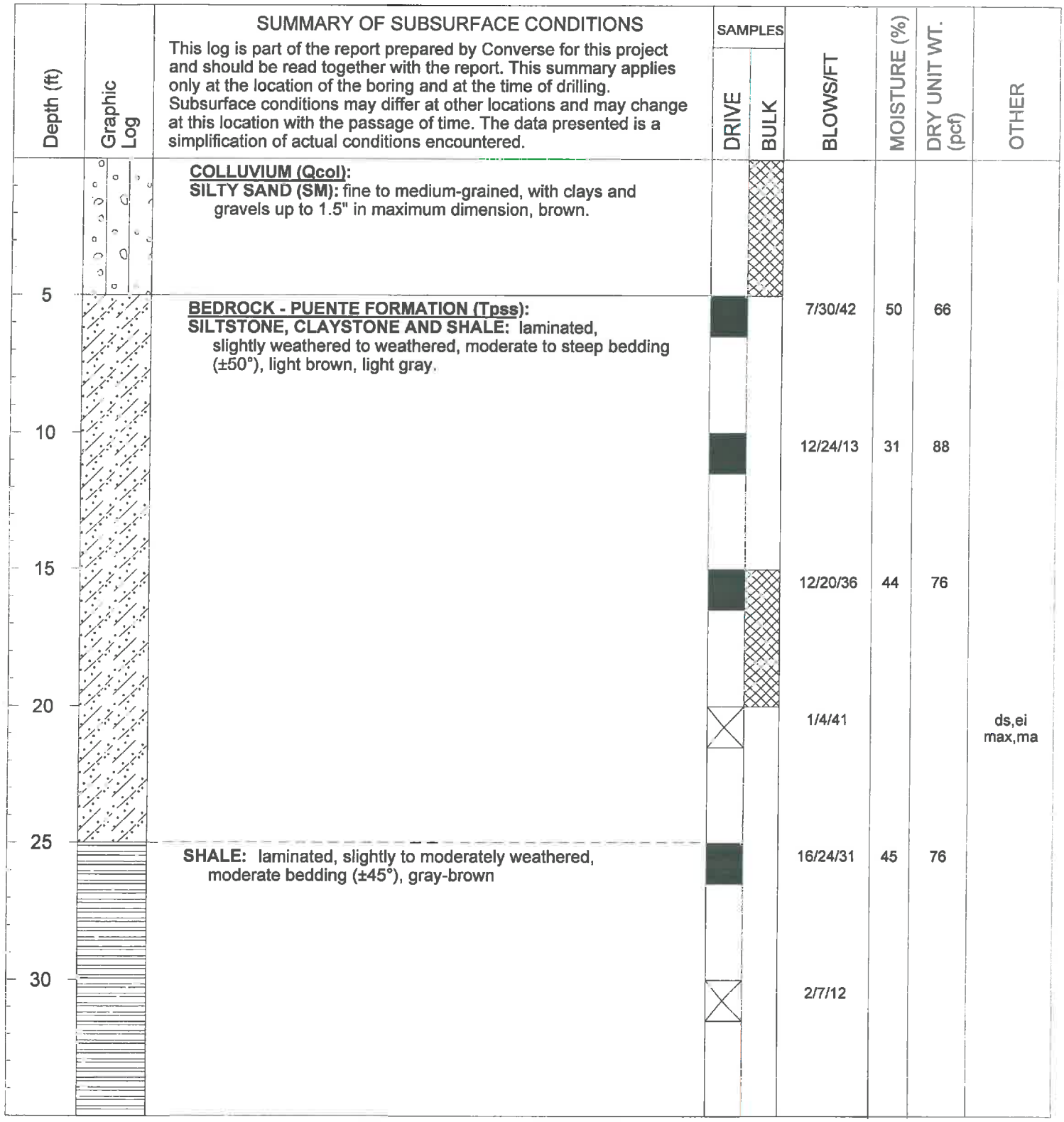
Drawing No. A2-10c

Log of Boring No. BH-B10

Dates Drilled: 4/10/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 846 Depth to Water (ft): NOT ENCOUNTERED



Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A-11a

Log of Boring No. BH-B10

Dates Drilled: 4/10/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 846 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly weathered to weathered, slightly fractured, gypsum cystals along fractures	■		9/18/25	38	80	
40		-becomes olive-brown	☒		5/18/15			
45			■		20/39/50(5")	61	61	
50			☒		8/15/26			
55		**SILTSTONE AND SHALE:** thinly bedded, slightly fractured, gypsum crystals along fractures, steep to near-vertical bedding (±70°), gray-brown	■		24/45/50(5")	36	84	
60			☒		18/25/36			
65		**MUDSTONE:** slightly fractured, slightly weathered, massive, gray-brown	■		22/37/50	43	80	

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A-11b

Log of Boring No. BH-B10

Dates Drilled: 4/10/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 846 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		BEDROCK - PUENTE FORMATION (Tpss): **SILTSTONE AND SHALE:** laminated, slightly weathered to weathered, gray brown	X		7/18/14			
75		**SILTSTONE AND SHALE:** thinly bedded, slightly weathered, steep to near-vertical bedding (±70°), gray brown	■		15/32/50(2")	46	74	
80			X		7/11/13			
85		**SILTSTONE, SANDSTONE AND SHALE:** slightly fractured, gypsum crystals along fractures, near-vertical bedding (±90°), dark brown, orange-brown	■		34/45/50	40	77	ds
90			X		12/13/23			
		End of boring at 91.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings on 4-10-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A-11c

Log of Boring No. BH-B11

Dates Drilled: 4/6/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 722 Depth to Water (ft): 21.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.						
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained with clay, with gravels up to 0.5" in maximum dimension, brown. **SANDY CLAY (CL):** fine to medium-grained sand, light brown.						ei
5					6/14/21	28	83	ds
10		**ALLUVIUM (Qal):** **SANDY CLAY (CL):** fine to medium-grained sand, dark brown, black.			2/4/6			
15					9/15/22	24	100	c
20					4/6/10			
25		**CLAYEY SILT (ML):** caliche stringers, brown.			6/14/27	20	108	
30					5/11/18			

Converse Consultants

Project Name: MT. SAC HILLTOP REMOVAL, WALNUT, CALIFORNIA

Project No.: 13-31-116-01

Drawing No.: A2-12a

Log of Boring No. BH-B11

Dates Drilled: 4/6/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 722 Depth to Water (ft): 21.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		SAND (SP): medium to coarse-grained, with gravels up to 1.5" in maximum dimension, orangish brown.	■		16/50(5")	9	128	
40			☒		8/18/16			
45		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, SANDSTONE AND SHALE** laminated, slightly weathered, near vertical bedding (±90°), gray-brown, orange-brown	■		15/50(5")	28	90	
50			☒		23/23/43			
		End of boring at 51.5 feet. Groundwater encountered at 21.5 feet. Borehole backfilled with soil cuttings on 4-6-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-12b

Log of Boring No. BH-B12

Dates Drilled: 4/6/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 721 Depth to Water (ft): 19.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained, with clays and gravels up to 1" maximum dimension, brown.						
5		**SANDY CLAY (CL):** fine to medium-grained sand, brown.	■		4/4/6	28	86	ei
10		**ALLUVIUM (Qal):** **CLAYEY SAND (SC):** medium to coarse-grained, dark orange-brown.	■		4/8/10	14	115	
15			☒		2/2/5			
20		**CLAY (CL):** trace of fine-grained sand, brown.	■		4/3/4	35	92	c
25			☒		5/6/6			
30		**CLAYEY SAND (SC):** fine to medium-grained, gravels up to 1/3" in maximum dimension, brown.	■		7/9/10	19	106	

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-13a

Log of Boring No. BH-B12

Dates Drilled: 4/6/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 721 Depth to Water (ft): 19.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		CLAY (CL): brown.	X		8/11/14			
40		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE, SHALE AND SANDSTONE** laminated, slightly weathered to weathered, steep to near-vertical bedding (±70°), gray-brown, orange-brown.	■		8/18/27	25	94	
45			X		20/28/22			
50			■		36/50(4")	34	88	
		End of boring at 51.5 feet. Groundwater encountered at 19.5 feet. Borehole backfilled with soil cuttings on 4-6-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-13b

Log of Boring No. BH-B13

Dates Drilled: 4/6/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 717 Depth to Water (ft): 17.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		FILL (Af): **CLAYEY SAND (SC):** fine to medium-grained, with silts, brown. **CLAY (CL):** trace fo fine medium-grained sand and silt, dark brown.						
5			■		3/5/7	25	94	
10			■		2/3/5	36	78	c
15		**ALLUVIUM (Qal):** **CLAYEY SAND (SC):** fine to medium-grained, light brown.	⊠		2/5/8			
20		**SANDY CLAY (CL):** fine to medium-grained sand, brown.	■		2/4/5	25	100	
25		**CLAYEY SAND (SC):** medium to coarse-grained, with gravels up to 1" in maximum dimension, light brown.	⊠		5/7/5			
30		-becomes orange-brown	■		5/10/21	30	98	

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-14a

Log of Boring No. BH-B13

Dates Drilled: 4/6/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 717 Depth to Water (ft): 17.5

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		CLAYEY SAND (SC): medium to coarse-grained, with gravels up to 1" in maximum dimension, light brown.	X		20/17/36			
40		**GRAVELLY CLAY (CL):** some fine to coarse-grained sand, gravels up to 2" in maximum dimension, brown.	■		16/30/45	15	108	
45			X		6/7/14			
50		**BEDROCK - PUENTE FORMATION (Tpss):** **SILTSTONE AND SHALE:** laminated, slightly fractured, sligtly weathered, gray-brown, orange-brown	■		12/20/30	29	92	
		End of boring at 51.5 feet. Groundwater encountered at 17.5 feet. Borehole backfilled with soil cuttings on 4-6-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-14b

Log of Boring No. BH-B14

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 744 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES: DRIVE	SAMPLES: BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		4" ASPHALT OVER 7" BASE						
		FILL (Af): **SILTY SAND (SM):** fine to medium-grained, light brown. **CLAYEY SAND (SC):** fine to medium-grained, with gravels up to 1" in maximum dimension, orangish brown.						
5			■		8/10/10			
10		**ALLUVIUM (Qal):** **SILTY SAND (SM):** fine to medium-grained, with few clays, gravels up to 1/2" in maximum dimension, orangish brown.	■		9/16/19			
15			■		6/9/11	20	109	
20		**SILTY SAND (SM):** medium to coarse-grained, orange-brown.	■		5/5/6	11	113	
25		**CLAYEY SAND (SC):** fine to coarse-grained, gray brown.	■		7/16/24	15	120	
		End of boring at 26.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings and bentonite chips, tamped and patched with asphalt on 4-12-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-15

Log of Boring No. BH-B15

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 749 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		3.5" ASPHALT OVER 7" BASE						
		FILL (Af): **SAND WITH CLAY (CL):** fine to medium-grained, with gravels up to 1" in maximum dimension.						ma
5		**CLAYEY SAND (SC):** fine to medium-grained, with gravels up to 0.5" in maximum dimension, dark brown.			4/11/13	23	89	
10		**ALLUVIUM (Qal):** **SANDY CLAY (CL):** fine to medium-grained, dark brown.			6/9/13	34	94	
15		**CLAYEY SAND (SC):** gravels up to 3/4" in maximum dimension, brown.			6/10/12	17	113	
20		**GRAVELLY SAND (SP):** medium to coarse-grained, gravels up to 1" in maximum dimension, orange-brown.			19/35/19			
		End of boring at 21.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings and bentonite chips, tamped and patched with asphalt on 4-12-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-16

Log of Boring No. BH-B16

Dates Drilled: 4/12/2013 Logged by: MM Checked By: SCL/CLC

Equipment: 8" HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 742 Depth to Water (ft): NOT ENCOUNTERED

Depth (ft)	Graphic Log	SUMMARY OF SUBSURFACE CONDITIONS This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered.	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FT	MOISTURE (%)	DRY UNIT WT. (pcf)	OTHER
		4.5" ASPHALT/6" BASE						
		FILL (Af): **CLAYEY SAND (SC):** fine to medium-grained, with gravels up to 1" in maximum dimension, dark brown.			6/10/14			max,ei
5		**SANDY CLAY (CL):** fine to medium-grained sand, dark brown.			6/10/14	32	86	
10		**ALLUVIUM (Qal):** **CLAYEY SAND (SC):** fine to medium-grained, with gravels up to 1" in maximum dimension, orangish brown.			7/10/19	6	123	c
15					5/6/7	4	120	
20		**SAND (SP):** medium to coarse-grained, with gravels up to 1" in maximum dimension, orangish brown.			10/17/24	4	115	
25		**CLAYEY SAND (SC):** gravels up to 1 1/2" in maximum dimension, dark brown.			10/13/18	15	116	
		End of boring at 26.5 feet. No groundwater encountered during drilling. Borehole backfilled with soil cuttings and bentonite chips, tamped and patched with asphalt on 4-12-13.						

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. A2-17

APPENDIX B

LABORATORY TESTING PROGRAM

APPENDIX B

LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their relevant physical characteristics and engineering properties. The amount and selection of tests were based on the geotechnical requirements of the project. Test results are presented herein and on the Logs of Borings in Appendix A, *Field Exploration*. The following is a summary of the laboratory tests conducted for this project.

Moisture Content and Dry Density

Results of moisture content and dry density tests, performed on relatively undisturbed ring samples were used to aid in the classification of the soils and to provide quantitative measure of the *in situ* dry density. Data obtained from this test provides qualitative information on strength and compressibility characteristics of site soils. For test results, see the Logs of Borings in Appendix A, *Field Exploration*.

Grain-Size Analysis

To assist in classification of soils, mechanical grain-size analysis was performed on One (1) selected sample. Testing was performed in general accordance with the ASTM Standard C136 test method. Grain-size curves are shown in Drawing No. B-1, *Grain Size Distribution Results*.

Percent Finer than Sieve No. 200

The percent finer than sieve No. 200 tests were performed on nine (9) representative soil samples to aid in the classification of the on-site soils and to estimate other engineering parameters. Testing was performed in general accordance with the ASTM Standard D1140 test method. Test results are presented in the Logs of Borings in Appendix A, *Field Exploration*.

Atterberg Limits

Atterberg limits test were performed on two (2) representative samples to assist the classification of the soil and fill materials according to ASTM Standard D4318 test method. The test results are presented in the following table and on Drawing No. B-2, *Atterburg Limits Results*.

Table No. B-1 Atterberg Limit Test Results

Boring No.	Depth (feet)	Soil Classification	Liquid Limit (%)	Plastic Limit (%)	Plastic Index (%)
BH-15	25	Fat Clay (CH)	58	29	29
BH-25	5	Clay (CL)	43	18	25

Maximum Dry Density Test

Three (3) laboratory maximum dry density-moisture content relationship test was performed on one representative bulk sample. The test was conducted in accordance with ASTM Standard D1557 laboratory procedure. The test result is presented on Drawing No. B-3, *Moisture-Density Relationship Results*.

Direct Shear

Direct shear tests were performed on ten (10) relatively undisturbed samples at soaked moisture conditions. For each test, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.01 inch/minute. Shear deformation was recorded until a maximum of about 0.50-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawing Nos. B-4a through B-4j, Direct *Shear Test Results,* and in the following table:

Table No. B-2, Direct Shear Test Results

Boring No.	Depth (feet)	Soil Classification	Peak Strength Parameters	
			Friction Angle (degrees)	Cohesion (psf)
BH-1	10	Bedrock (TPSS) Siltstone/Sandstone	47	0
BH-6	45	Bedrock (TPSS) Siltstone/Sandstone	28	270
BH-8	5	Bedrock (TPSS) Siltstone/Sandstone	33	270
BH-10	5	Silty Sand (SM)	28	555
BH-12	5	Clay (CL)	35	300
BH-13	20	Clay (CL)	36	315
BH-19	5	Bedrock (TPSS) Siltstone/Sandstone	19	75
BH-20	5	Sandy Clay (CL)	34	450
BH-24	5	Clay (CL)	19	1515
BH-26	5	Clayey Sand (SC)	31	390

Consolidation Test

Consolidation tests were performed on five (5) selected samples. Data obtained from this test performed on a relatively undisturbed soil sample was used to evaluate the settlement characteristics of the foundation soils under load. Preparation for this test involved trimming the sample and placing the one-inch high brass ring into the test apparatus, which contained porous stones, both top and bottom, to accommodate drainage during testing. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various time periods. The load was increased after the sample reached a reasonable state of equilibrium. Normal loads were applied at a constant load-increment ratio, successive loads being generally twice the preceding load. The sample was tested at field and submerged conditions. The test results, including sample density and moisture content, are presented in Drawings Nos. B-5a through B-5e, *Consolidation Test Results*.

Expansion Index Test

Five (5) representative bulk samples were tested to evaluate the expansion potential of material encountered at the site. The test was conducted in accordance with ASTM D4829 Standard. Test results are presented in the following table:

Table No. B-3, Expansion Index Test Result

Boring No.	Depth (feet)	Soil Description	Expansion Index	Expansion Potential
BH-1	1-5	Sandy Clay (CL)	38	Low
BH-9	0-5	Clay (CL)	75	Medium
BH-16	0-5	Clay (CL)	71	Medium
BH-20	1-5	Sandy Clay (CL)	97	High
BH-25	1-5	Clay with Sand (CL)	85	Medium

R-value Test

One (1) representative bulk soil sample was tested for resistance value (R-value) in accordance with State of California Standard Method 301-G. This test is designed to provide a relative measure of soil strength for use in pavement design. The test results are shown in the following table:

Table No. B-4, R-value Test Result

Boring No.	Depth (feet)	Soil Classification	Measured R-value
BH-29	1-5	Clayey Sand (SC)	12

Soil Corrosivity

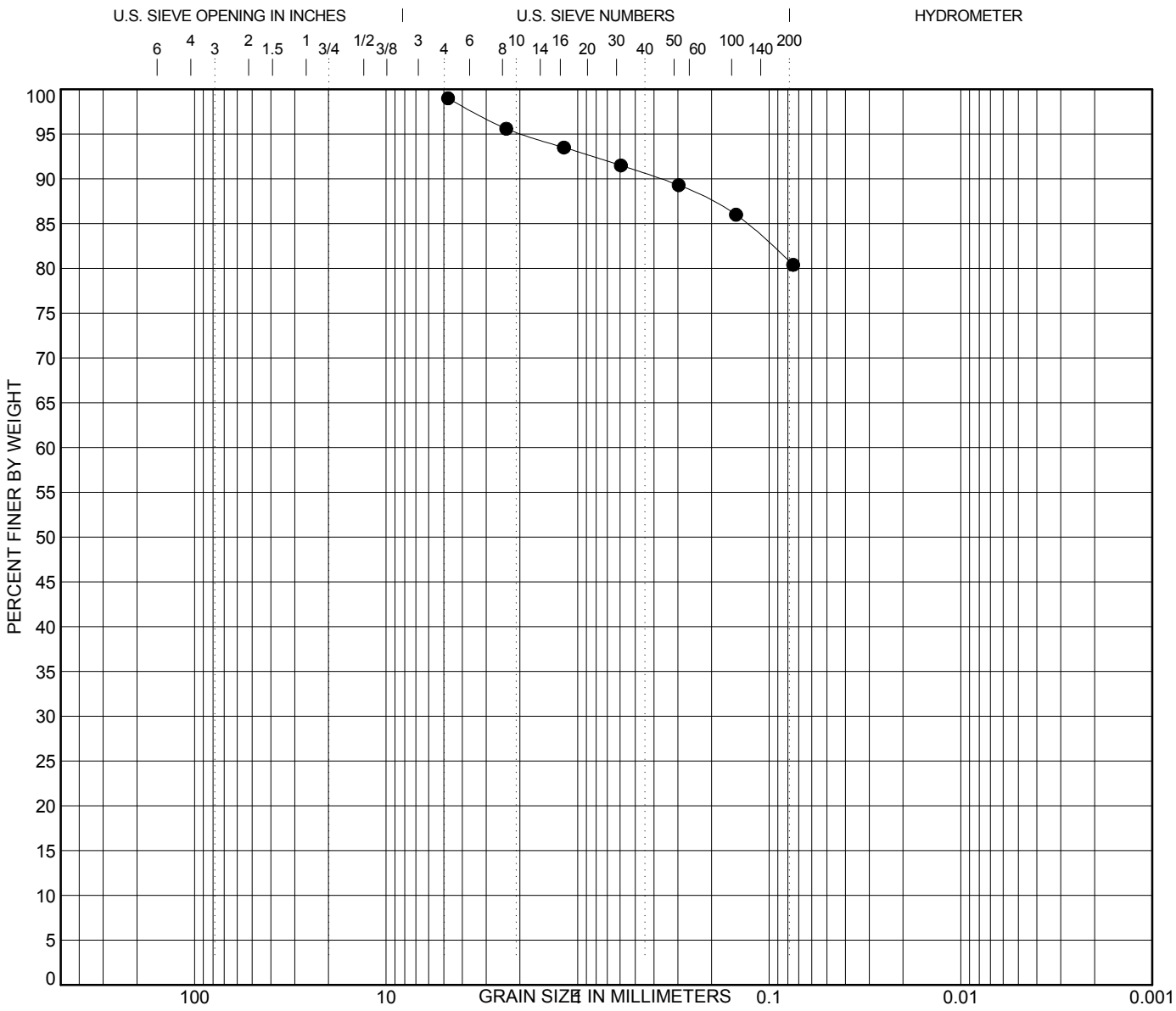
Six (6) representative soil samples were tested to determine minimum electrical resistivity, pH, and chemical content, including chloride concentrations, and soluble sulfate. The purpose of these tests is to determine the corrosion potential of site soils when placed in contact with common construction materials. These tests were performed by EGL in Arcadia, California. The test results received from EGL are included in the following table:

Table No. B-5, Corrosivity Test Results

Boring No.	Sample Depth (feet)	pH (Caltrans 643)	Soluble Chlorides (Caltrans 422) ppm	Soluble Sulfate (Caltrans 417) (% by weight)	Saturated Resistivity (Caltrans 532) Ohm-cm
BH-2	0-5	7.40	100	0.001	480
BH-10	1-5	7.60	110	0.026	460
BH-12	1-5	7.61	65	0.002	500
BH-13	0-5	7.66	280	0.052	380
BH-16	0-5	7.95	130	0.048	640
BH-24	1-5	7.36	85	0.002	1,300

Sample Storage

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period of time.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-28**	**0-5**	**SANDY SILT (ML)**					

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-28**	**0-5**	**4.75**				**0.0**	**18.6**	**80.4**	

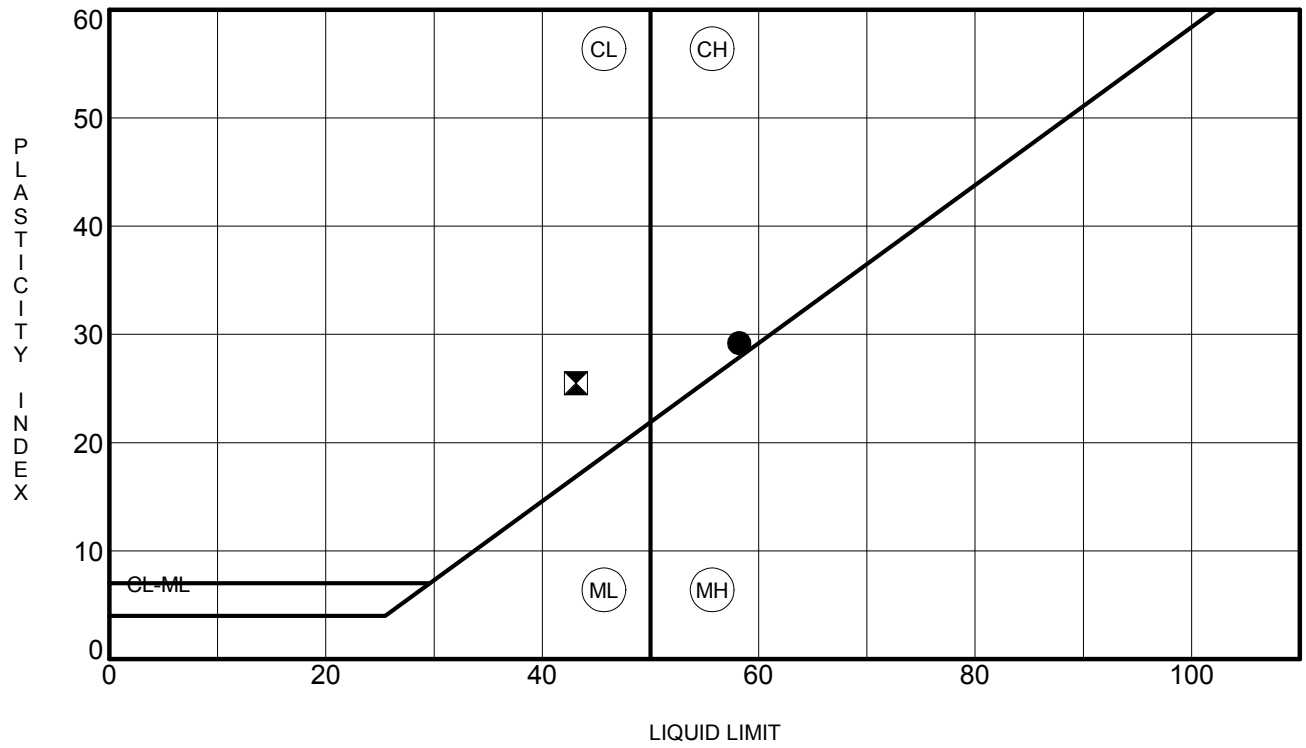
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-1**



Symbol	Boring No.	Depth (ft)	LL (%)	PL (%)	PI (%)	Description
●	**BH-15**	**25**	**58.2**	**29**	**29**	**Fat CLAY (CH)**
⧓	**BH-25**	**5**	**43.1**	**17.6**	**25**	**SANDY CLAY (CL)**

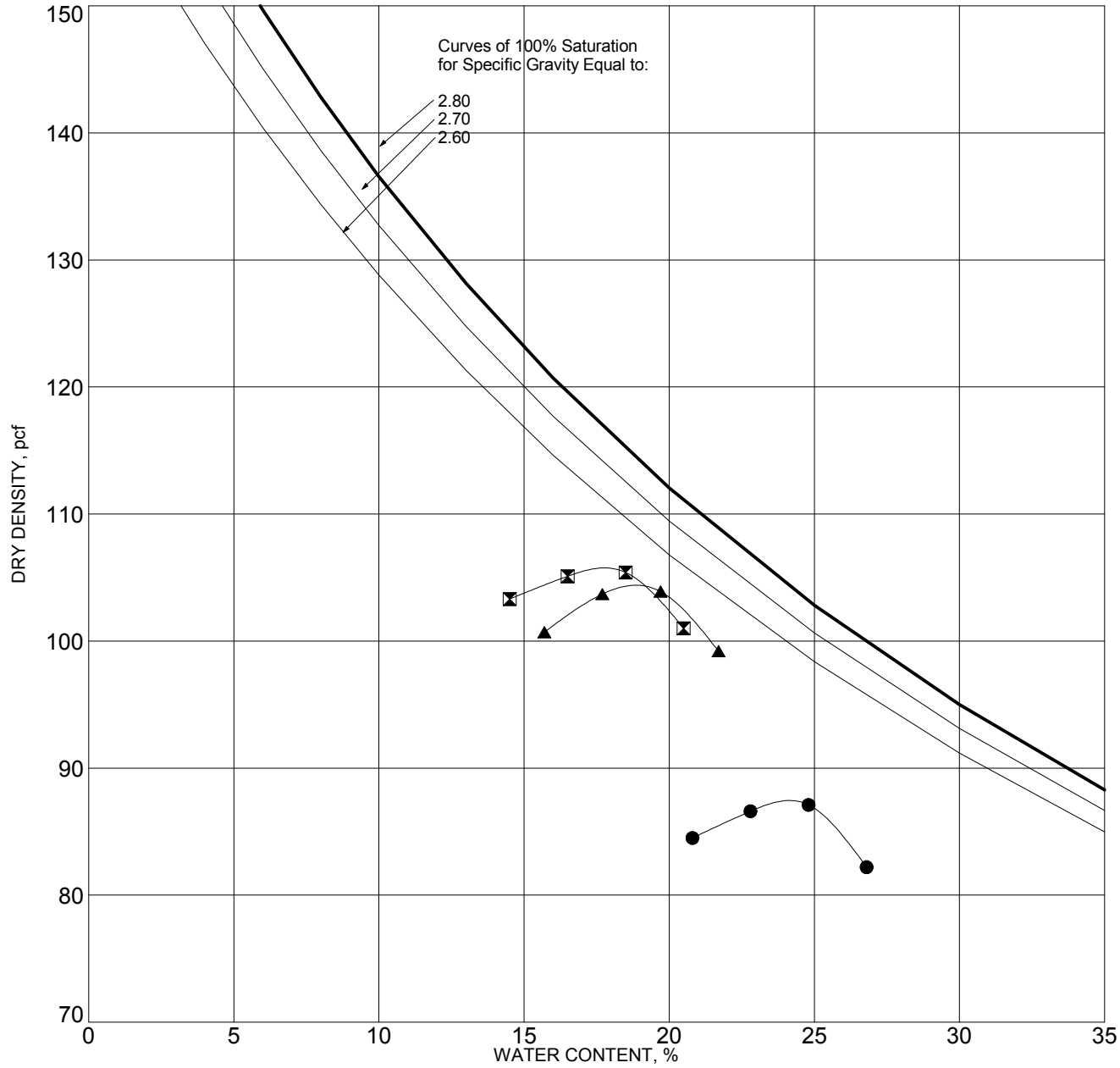
ATTERBERG LIMITS RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No.
14-31-124-01

Drawing No.
B-2



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	BH-17	0-5	SANDY SILT (ML)	D1557 Method A	23.8	87.5
⊠	BH-23	1-5	SANDY SILT (ML)	D1557 Method A	17.9	106
▲	BH-28	0-5	SANDY SILT (ML)	D1557 Method A	18.7	104.6

NOTE:

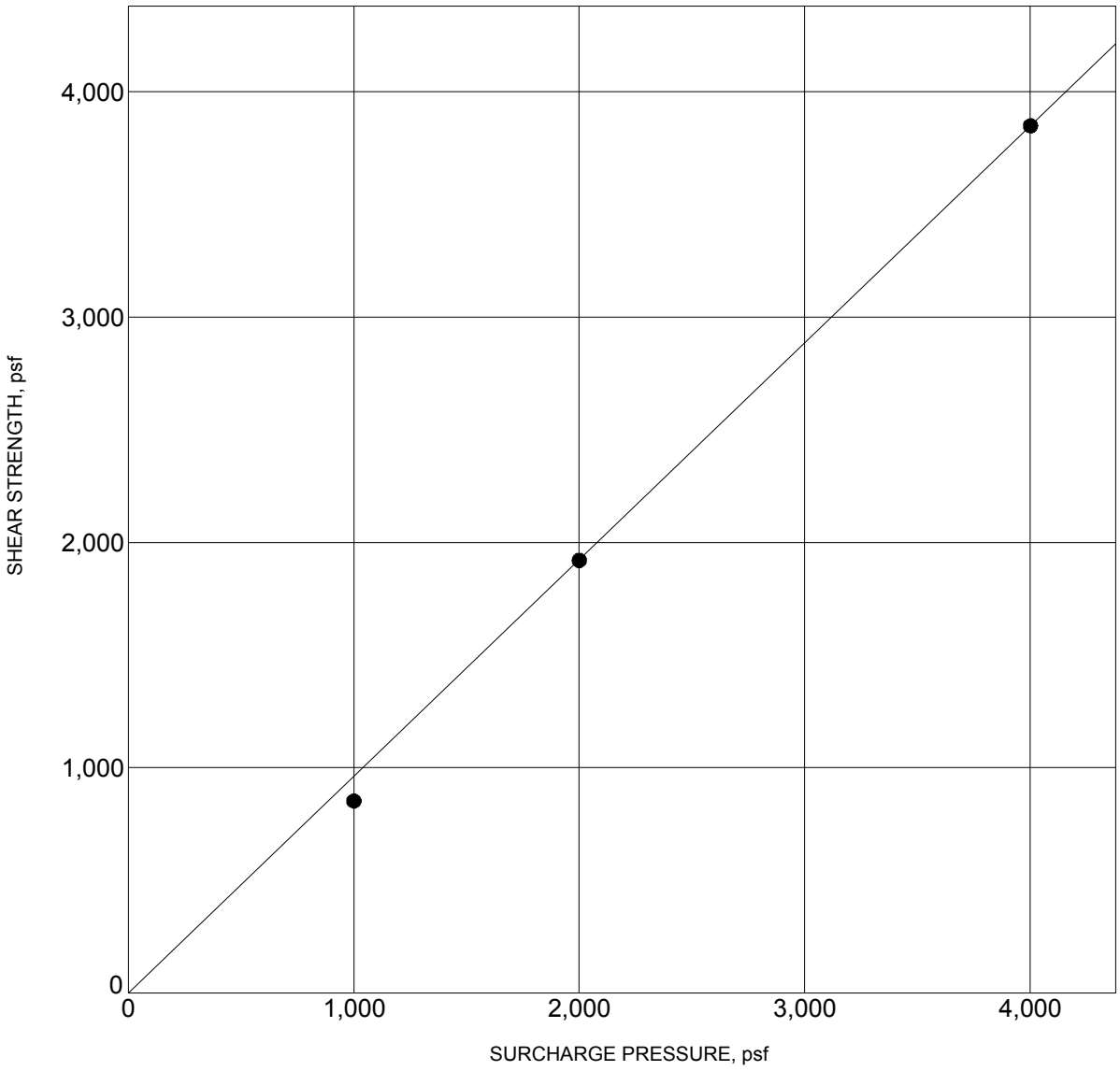
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No.
14-31-124-01

Drawing No.
B-3



BORING NO.	:	**BH- 1**	DEPTH (ft)	:	**10**
DESCRIPTION	:	**BEDROCK (Tpss): - SILTSTONE AND CLAYSTONE**			
COHESION (psf)	:	**0**	FRICTION ANGLE (degrees)	:	**47**
MOISTURE CONTENT (%)	:	**30.8**	DRY DENSITY (pcf)	:	**84.8**

NOTE: Ultimate Strength.

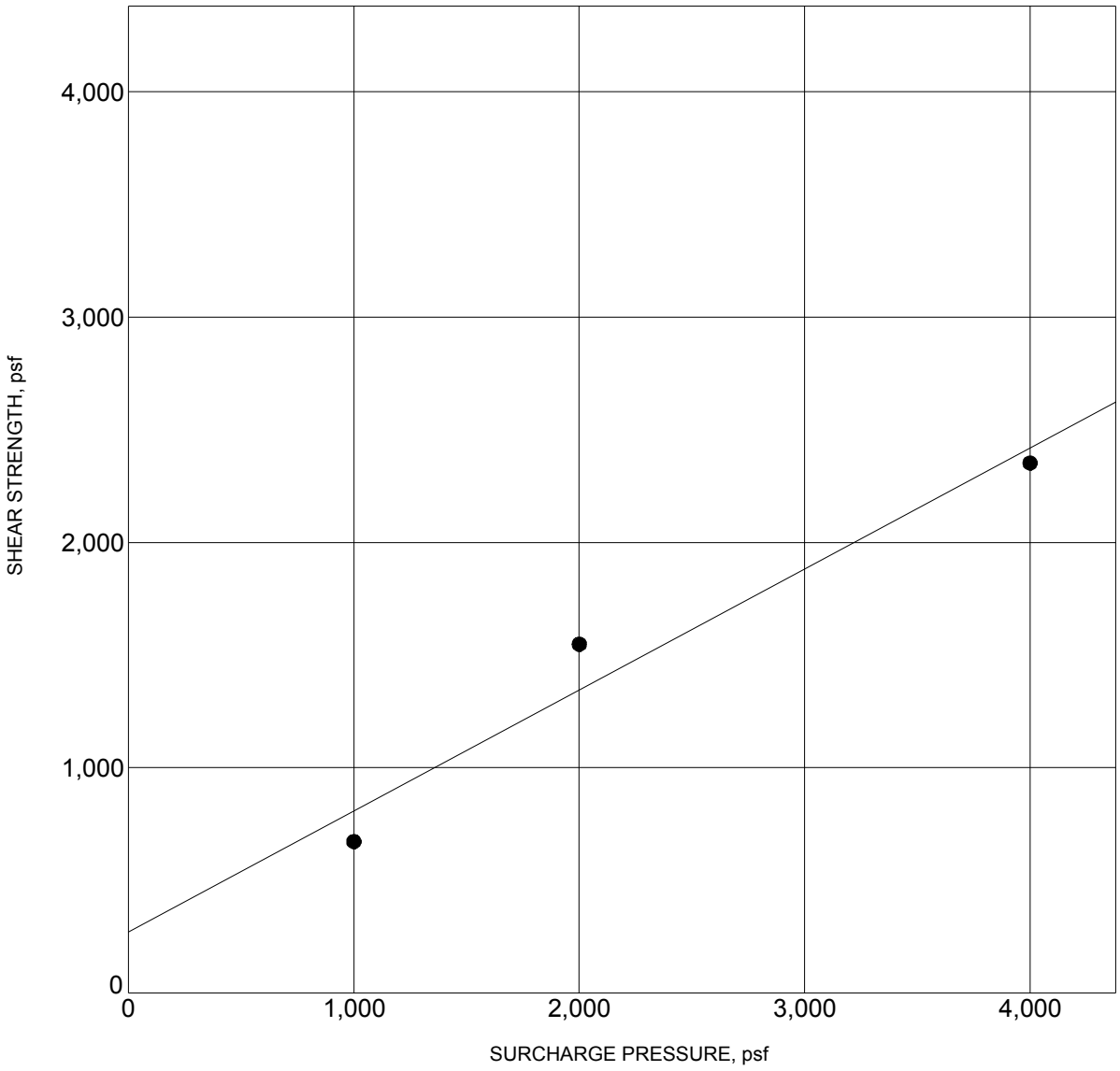
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4a**



BORING NO.	:	**BH- 6**	DEPTH (ft)	:	**45**
DESCRIPTION	:	**BEDROCK (Tpss): - SILTSTONE AND CLAYSTONE**			
COHESION (psf)	:	**270**	FRICTION ANGLE (degrees)	:	**28**
MOISTURE CONTENT (%)	:	**30.2**	DRY DENSITY (pcf)	:	**86.2**

NOTE: Ultimate Strength.

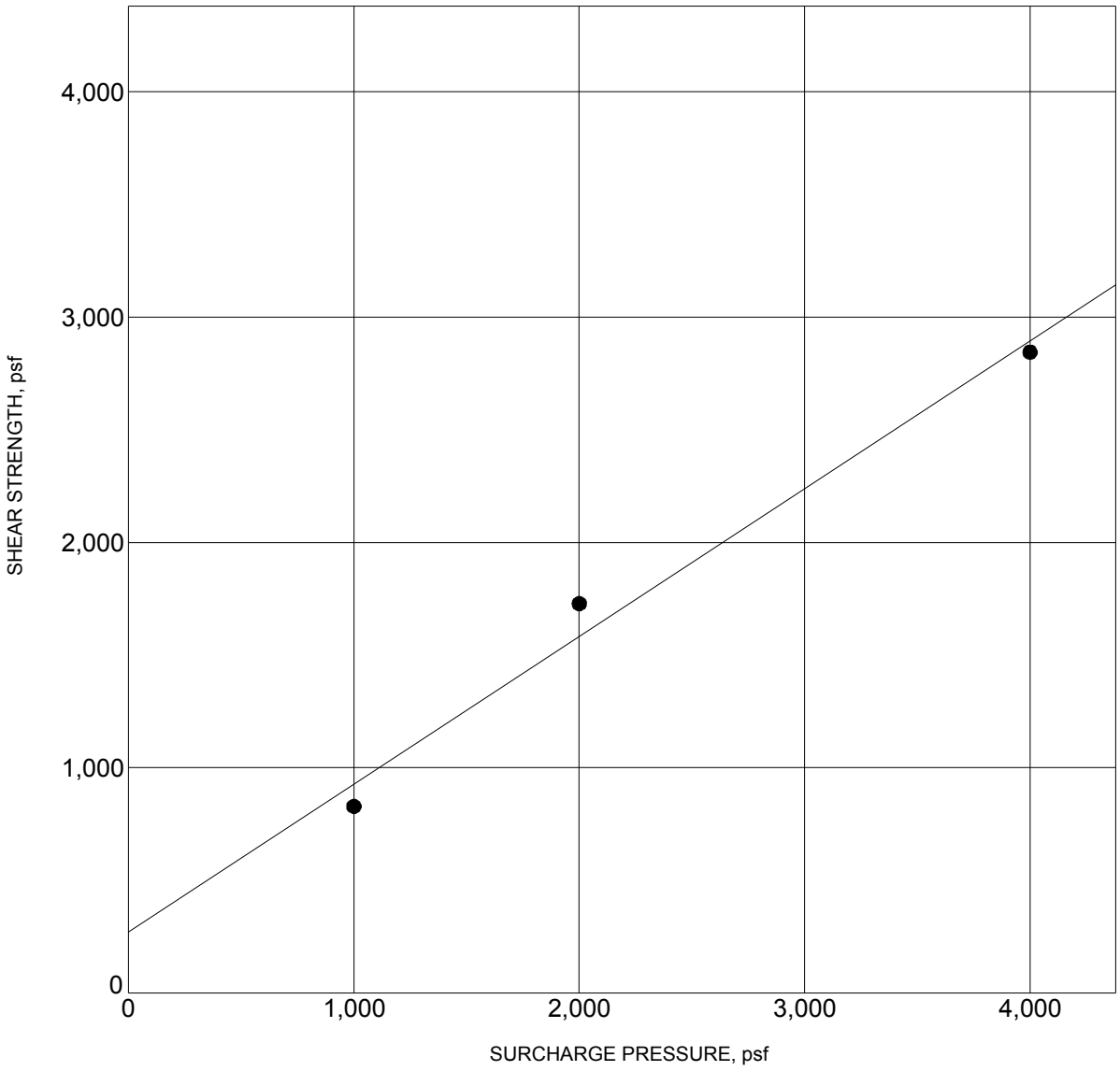
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4b**



BORING NO.	:	**BH- 8**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**BEDROCK (Tpss): - SILTSTONE AND CLAYSTONE**			
COHESION (psf)	:	**270**	FRICTION ANGLE (degrees)	:	**33**
MOISTURE CONTENT (%)	:	**21.2**	DRY DENSITY (pcf)	:	**89.8**

NOTE: Ultimate Strength.

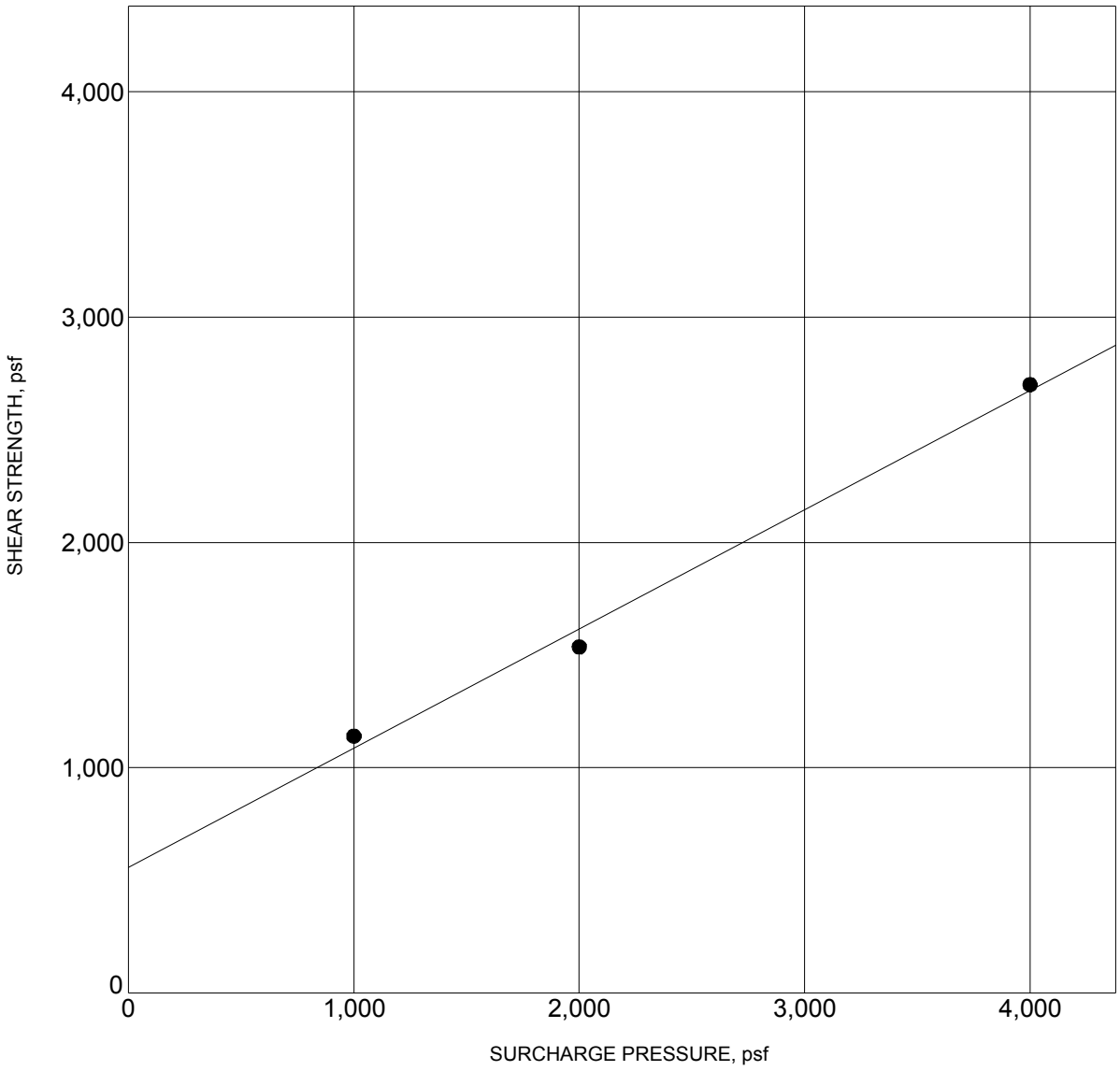
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4c**



BORING NO.	:	**BH-10**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**SILTY SAND (SM)**			
COHESION (psf)	:	**555**	FRICTION ANGLE (degrees)	:	**28**
MOISTURE CONTENT (%)	:	**22**	DRY DENSITY (pcf)	:	**80**

NOTE: Ultimate Strength.

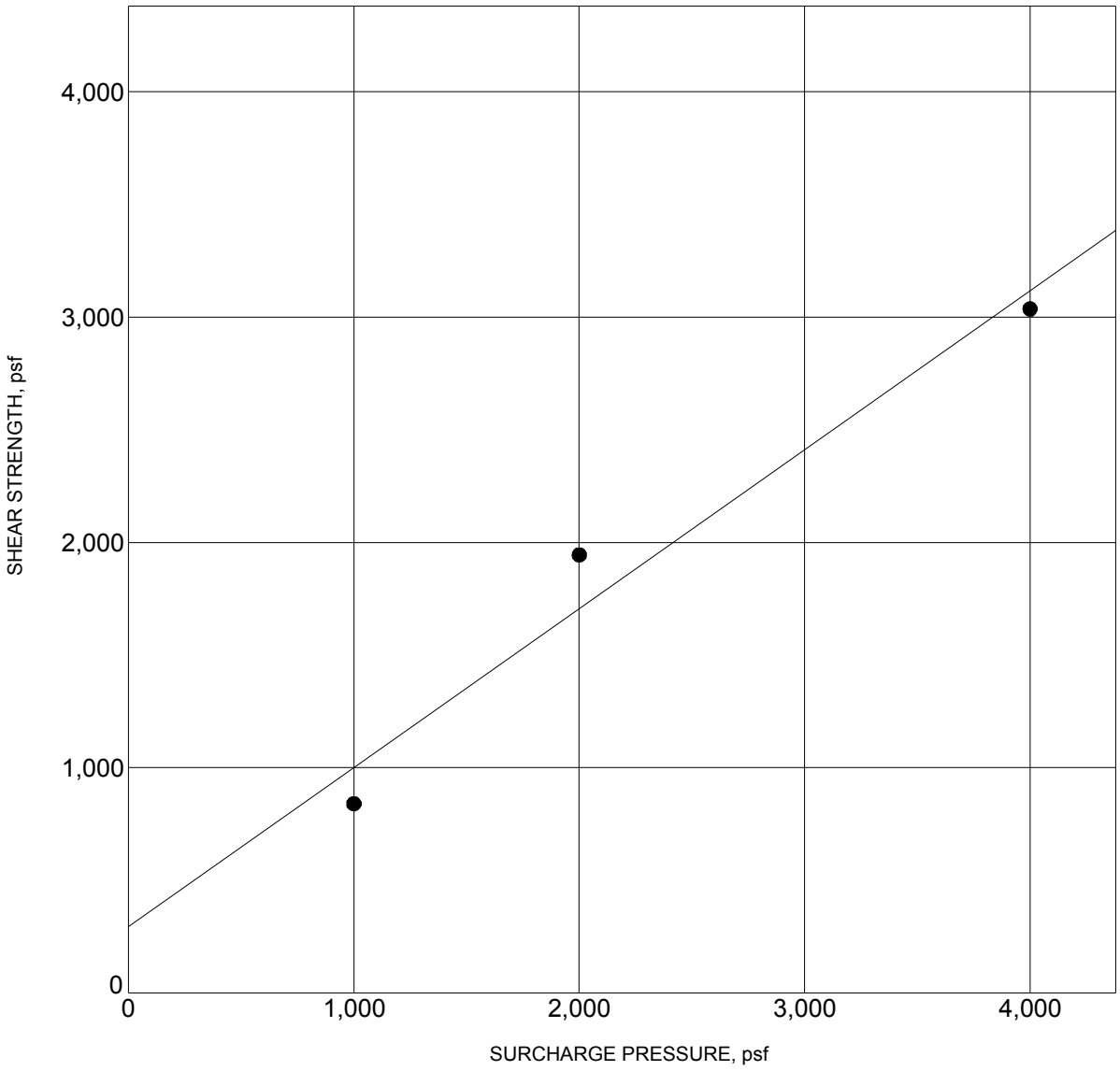
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4d**



BORING NO.	:	**BH-12**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**CLAY (CL)**			
COHESION (psf)	:	**300**	FRICTION ANGLE (degrees)	:	**35**
MOISTURE CONTENT (%)	:	**18.5**	DRY DENSITY (pcf)	:	**100.9**

NOTE: Ultimate Strength.

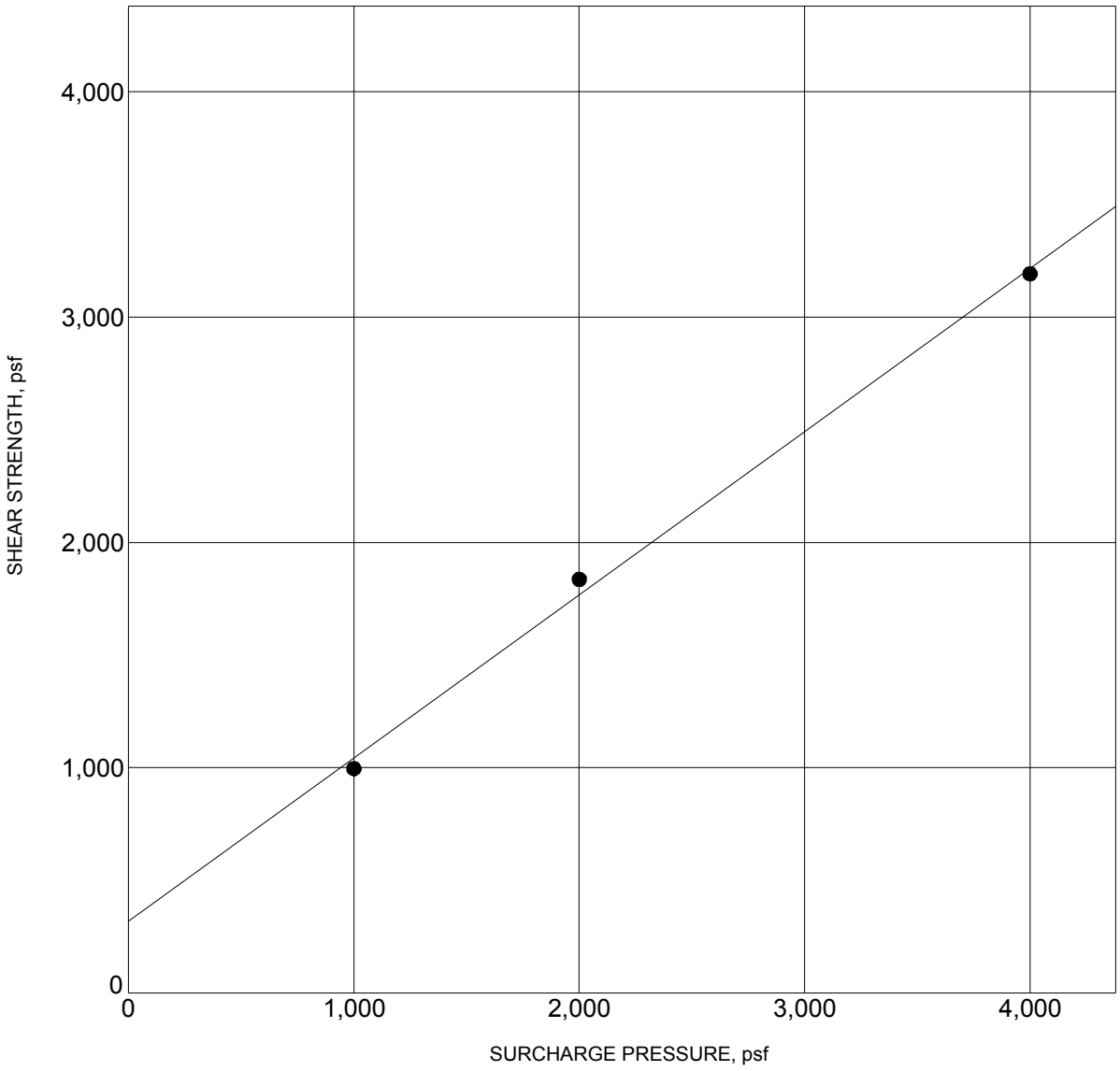
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4e**



BORING NO.	:	**BH-13**	DEPTH (ft)	:	**20**
DESCRIPTION	:	**CLAY (CL)**			
COHESION (psf)	:	**315**	FRICTION ANGLE (degrees)	:	**36**
MOISTURE CONTENT (%)	:	**20**	DRY DENSITY (pcf)	:	**116.9**

NOTE: Ultimate Strength.

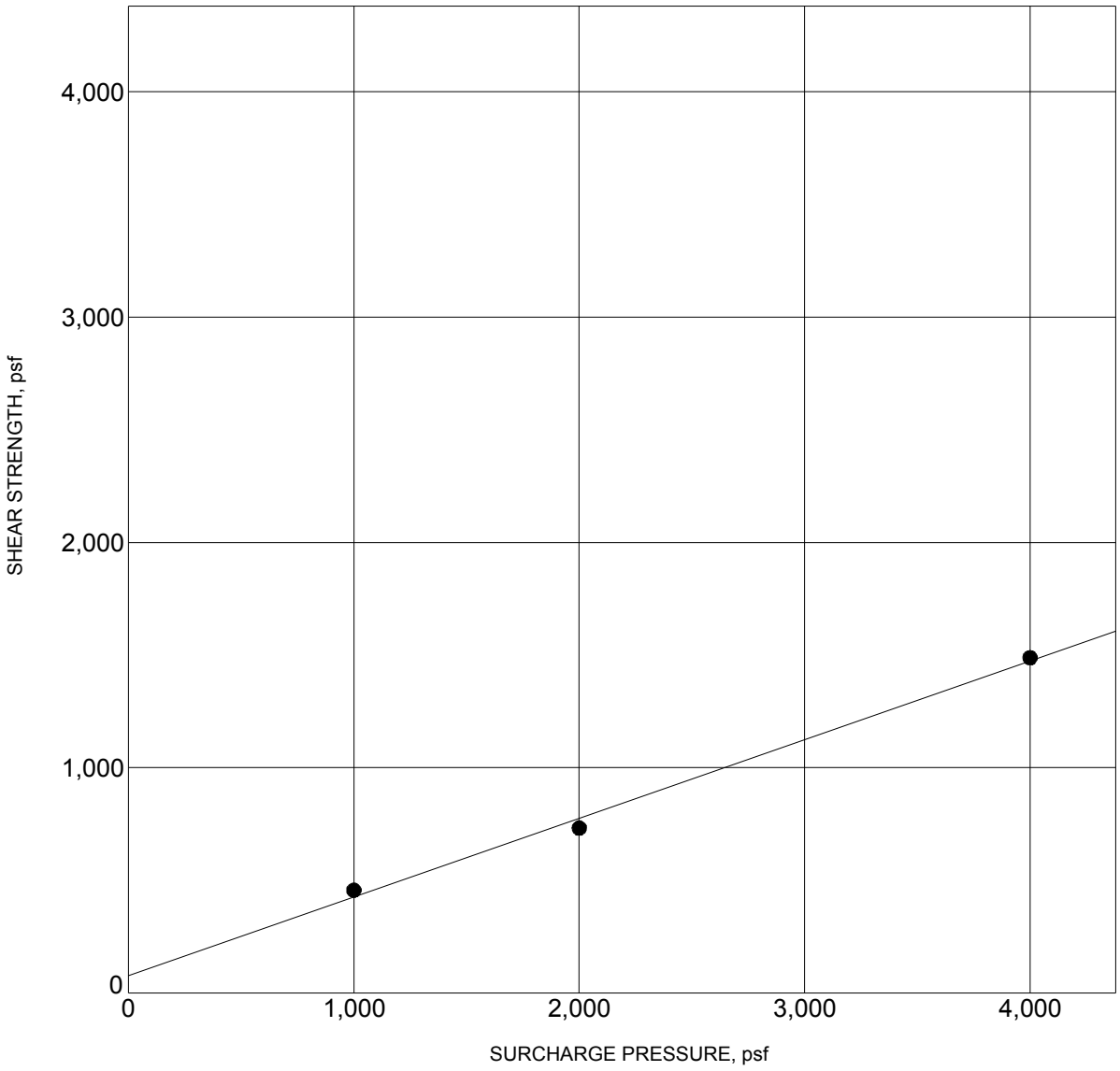
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4f**



BORING NO.	:	**BH-19**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**BEDROCK (Tpss): - SILTSTONE AND CLAYSTONE**			
COHESION (psf)	:	**75**	FRICTION ANGLE (degrees)	:	**19**
MOISTURE CONTENT (%)	:	**37.8**	DRY DENSITY (pcf)	:	**76.6**

NOTE: Ultimate Strength.

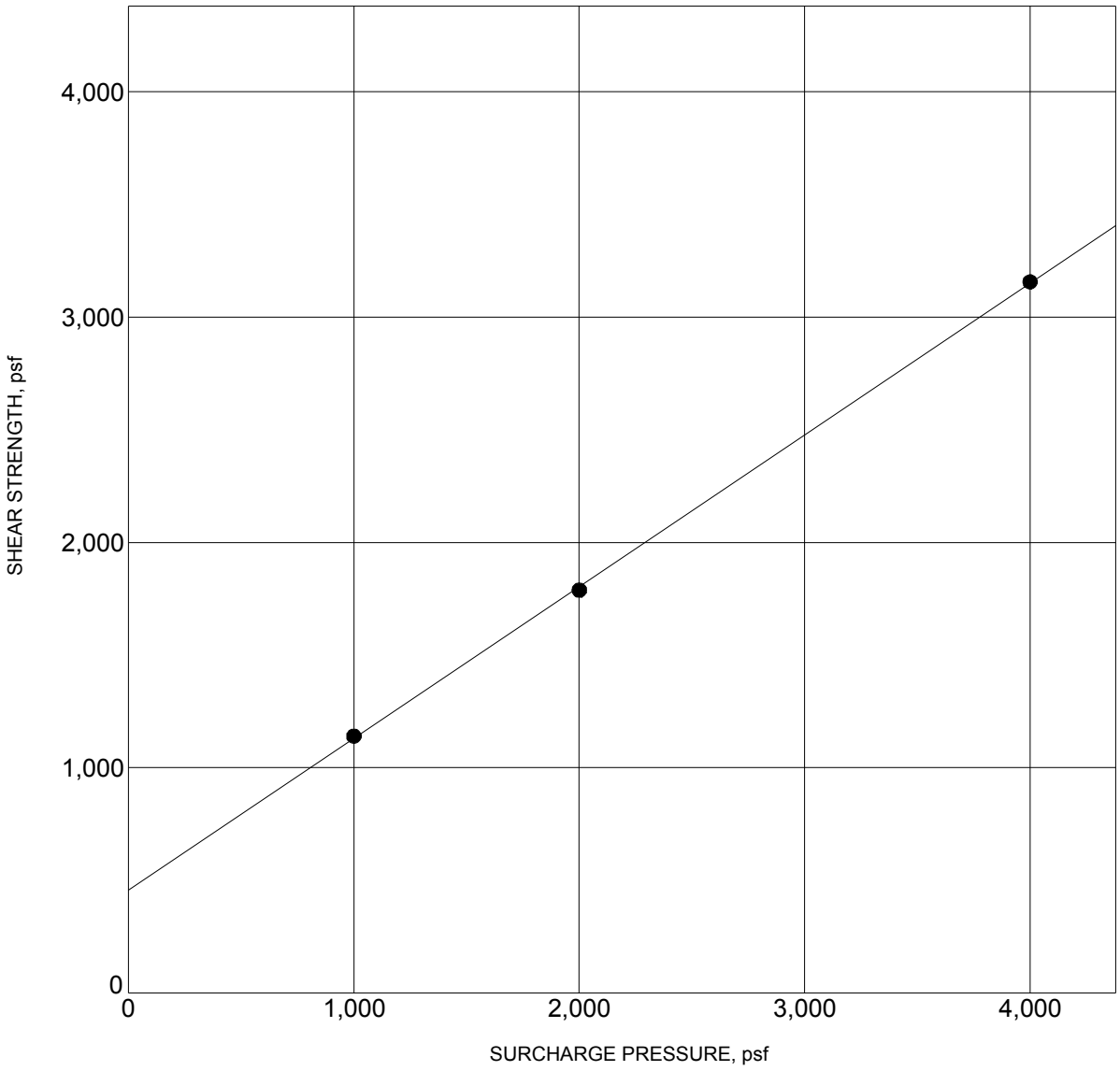
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4g**



BORING NO.	:	**BH-20**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**SANDY CLAY (CL)**			
COHESION (psf)	:	**450**	FRICTION ANGLE (degrees)	:	**34**
MOISTURE CONTENT (%)	:	**22.0**	DRY DENSITY (pcf)	:	**96.1**

NOTE: Ultimate Strength.

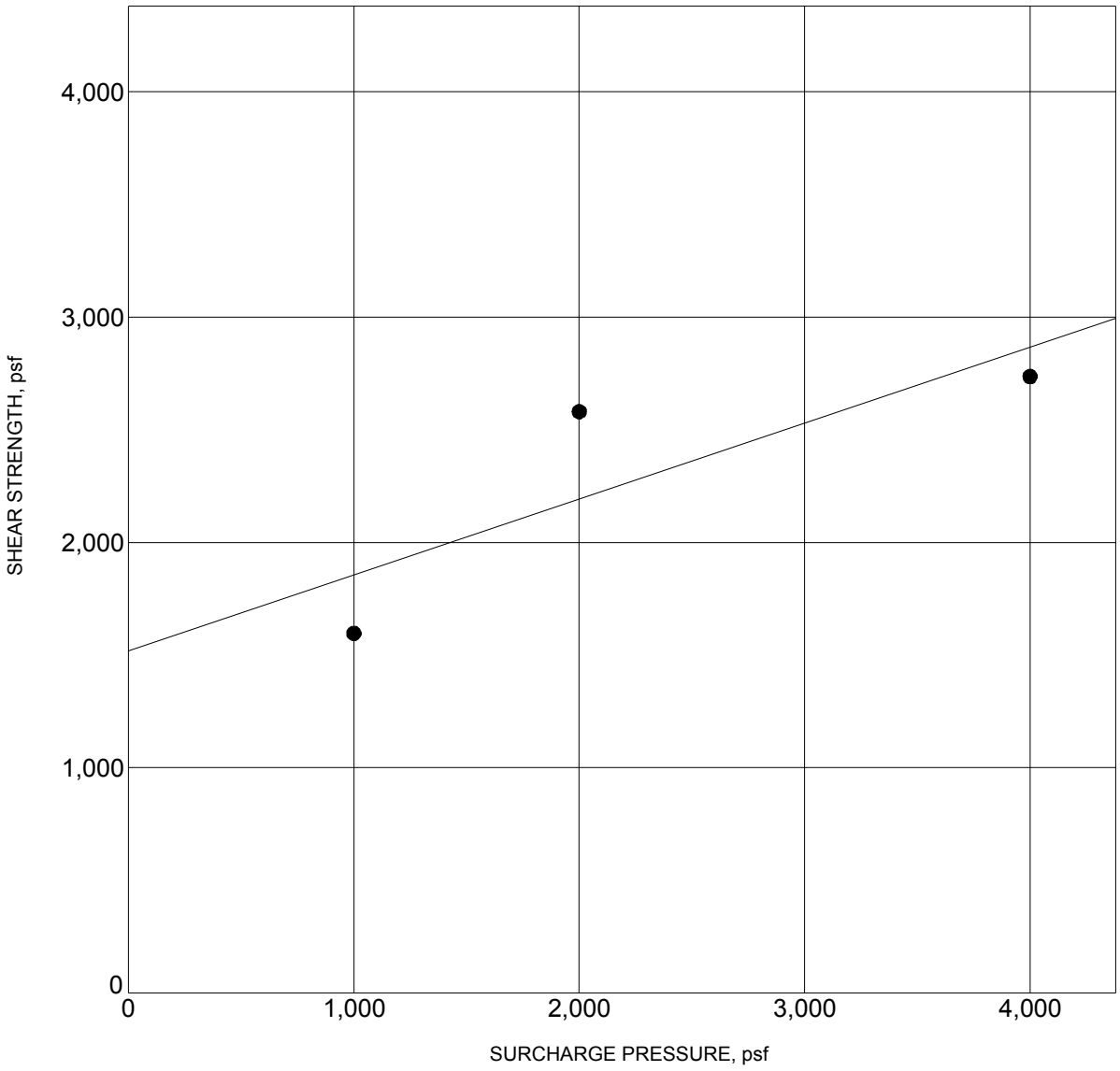
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4h**



BORING NO.	:	**BH-24**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**CLAY (CL)**			
COHESION (psf)	:	**1515**	FRICTION ANGLE (degrees)	:	**19**
MOISTURE CONTENT (%)	:	**11.1**	DRY DENSITY (pcf)	:	**110.3**

NOTE: Ultimate Strength.

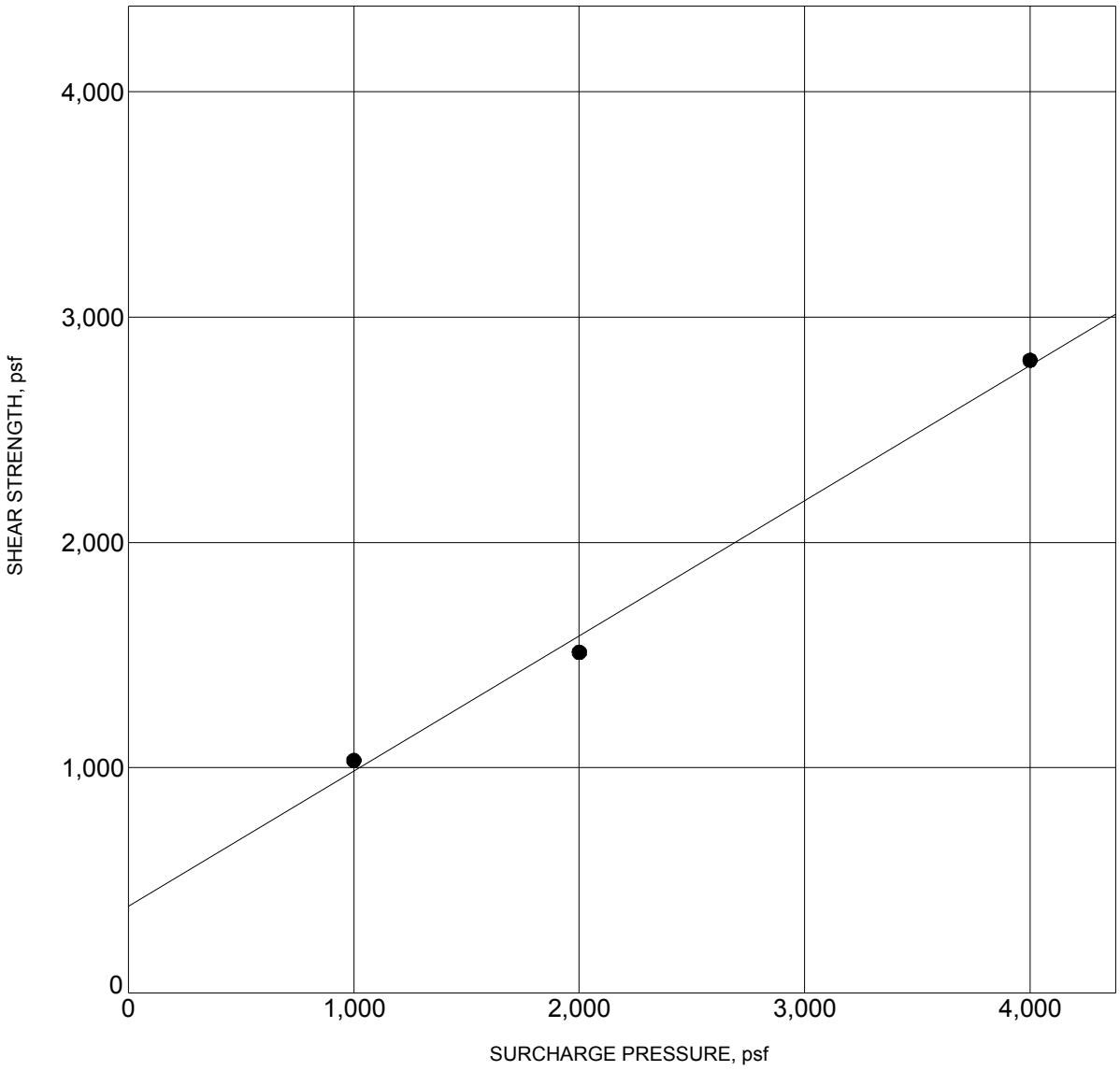
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4i**



BORING NO.	:	**BH-26**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**CLAYEY SAND (SC)**			
COHESION (psf)	:	**390**	FRICTION ANGLE (degrees)	:	**31**
MOISTURE CONTENT (%)	:	**15.9**	DRY DENSITY (pcf)	:	**112.6**

NOTE: Ultimate Strength.

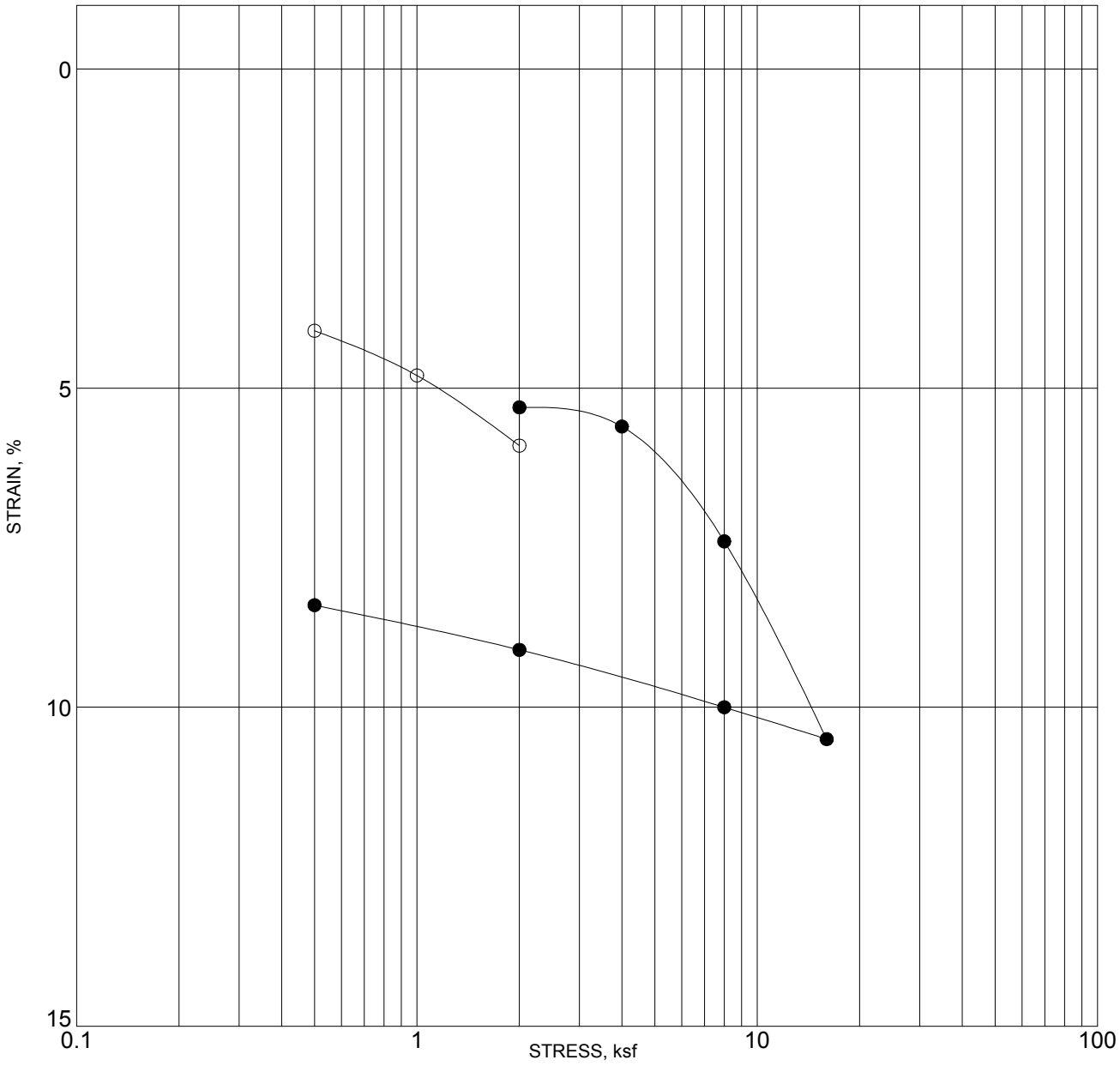
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-4j**



BORING NO. :	**BH-14**	DEPTH (ft) :	**25**
DESCRIPTION :	**SILTY CLAY (CL)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**33.2**	**84.8**		
FINAL	**32.4**	**91.9**		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

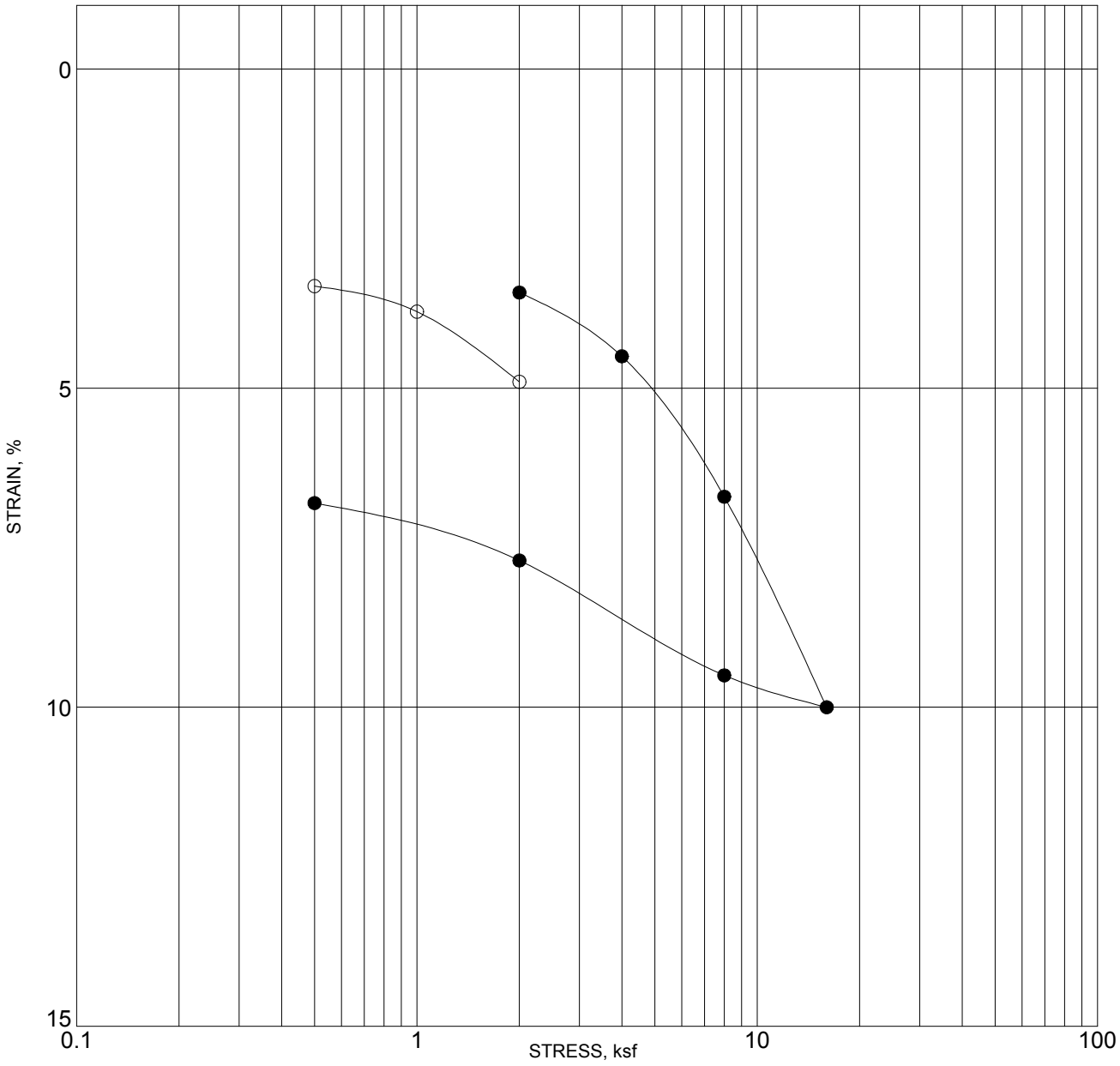
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-5a**



BORING NO. :	BH-14	DEPTH (ft) :	35
DESCRIPTION :	SILTY CLAY (CL)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	31.2	91.2		
FINAL	28.6	87.4		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

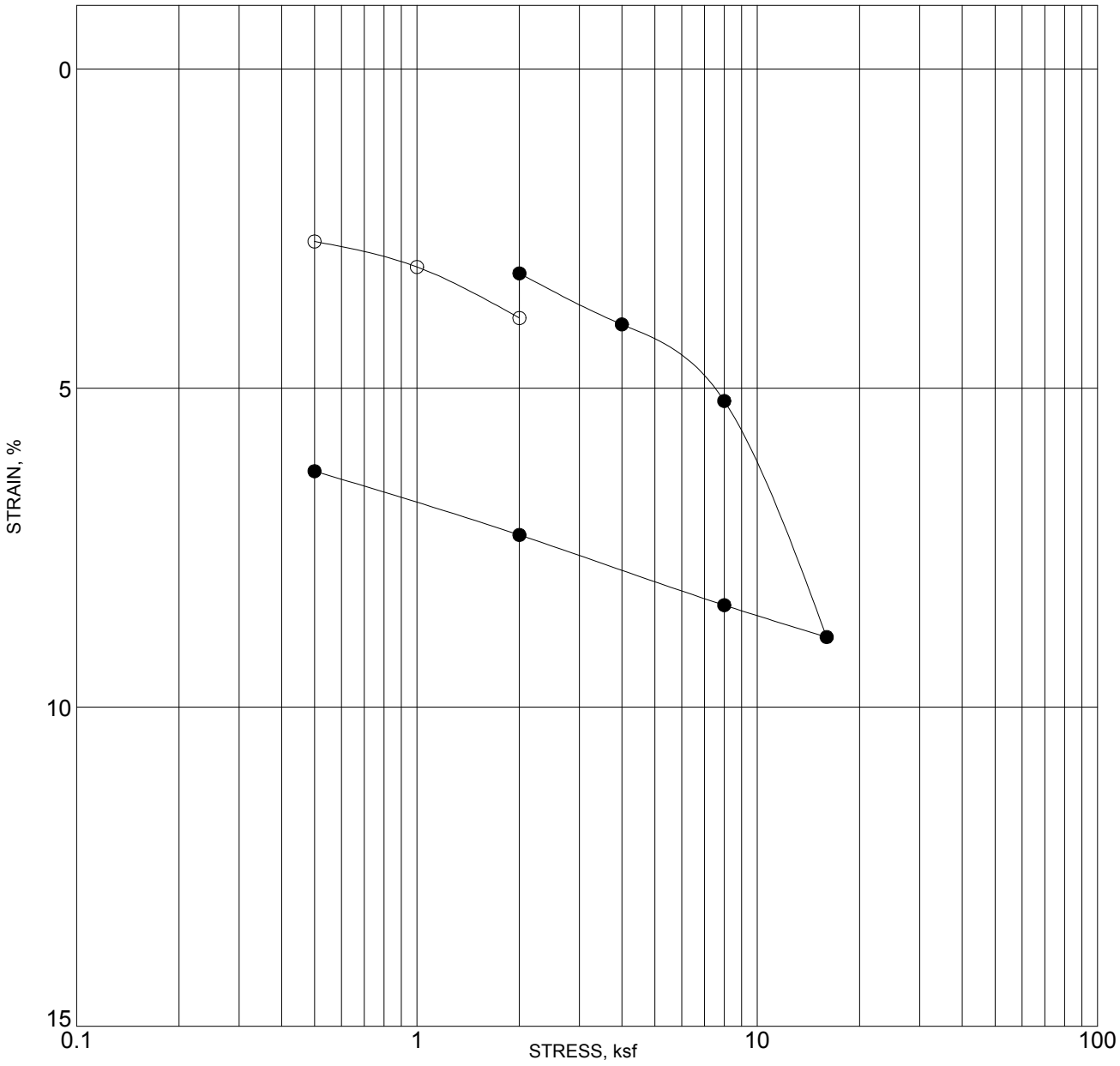
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-5b**



BORING NO. :	**BH-15**	DEPTH (ft) :	**15**
DESCRIPTION :	**CLAY (CL)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**26.7**	**87.4**		
FINAL	**29.3**	**92.9**		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

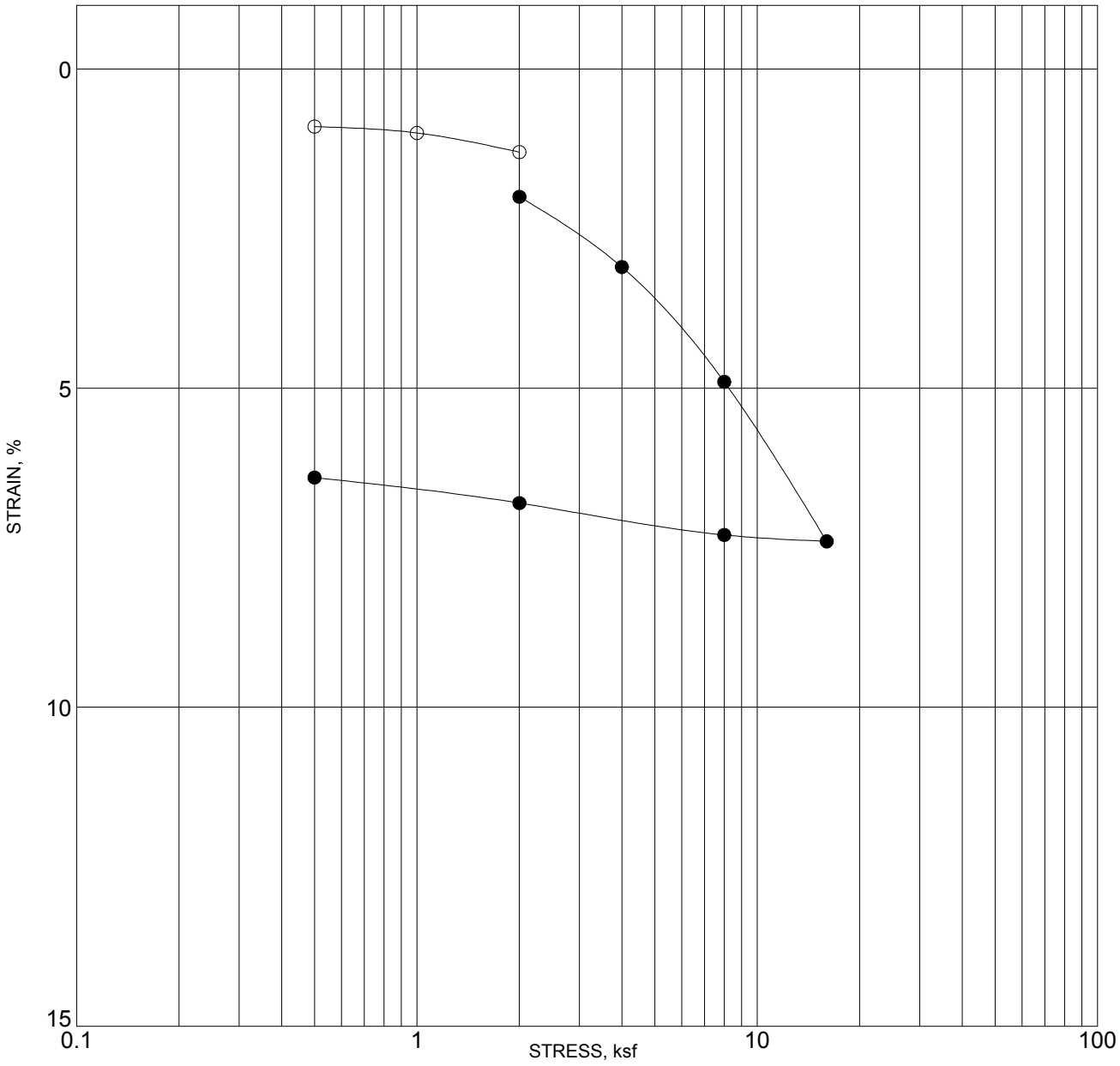
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-5c**



BORING NO. :	**BH-21**	DEPTH (ft) :	**5**
DESCRIPTION :	**CLAY (CL)**		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	**12.9**	**110.1**		
FINAL	**14.7**	**117.1**		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

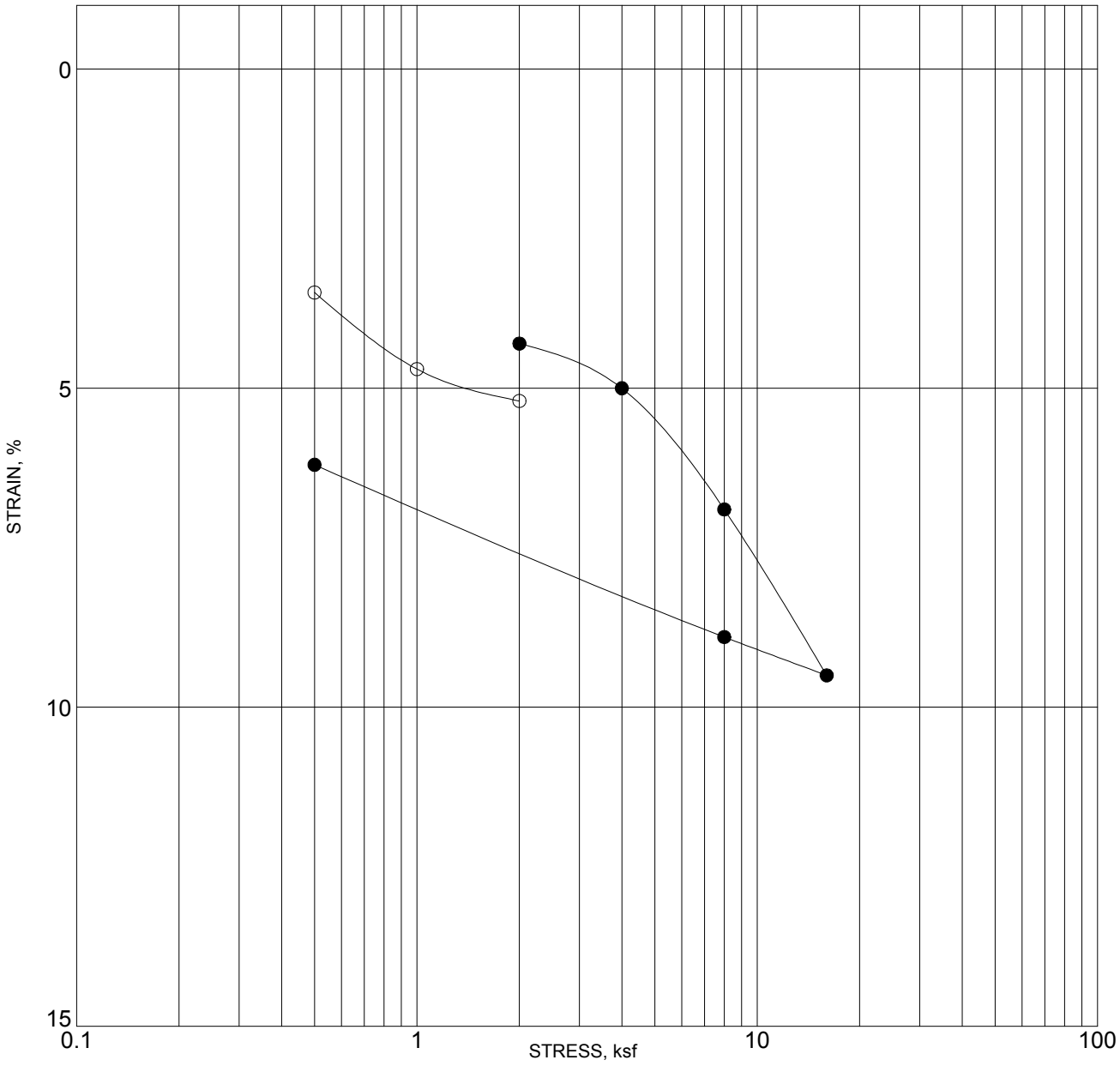
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-5d**



BORING NO. :	BH-23	DEPTH (ft) :	15
DESCRIPTION :	CLAY (CL)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	24	95		
FINAL	25.4	100.9		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

CONSOLIDATION TEST RESULTS

Converse Consultants

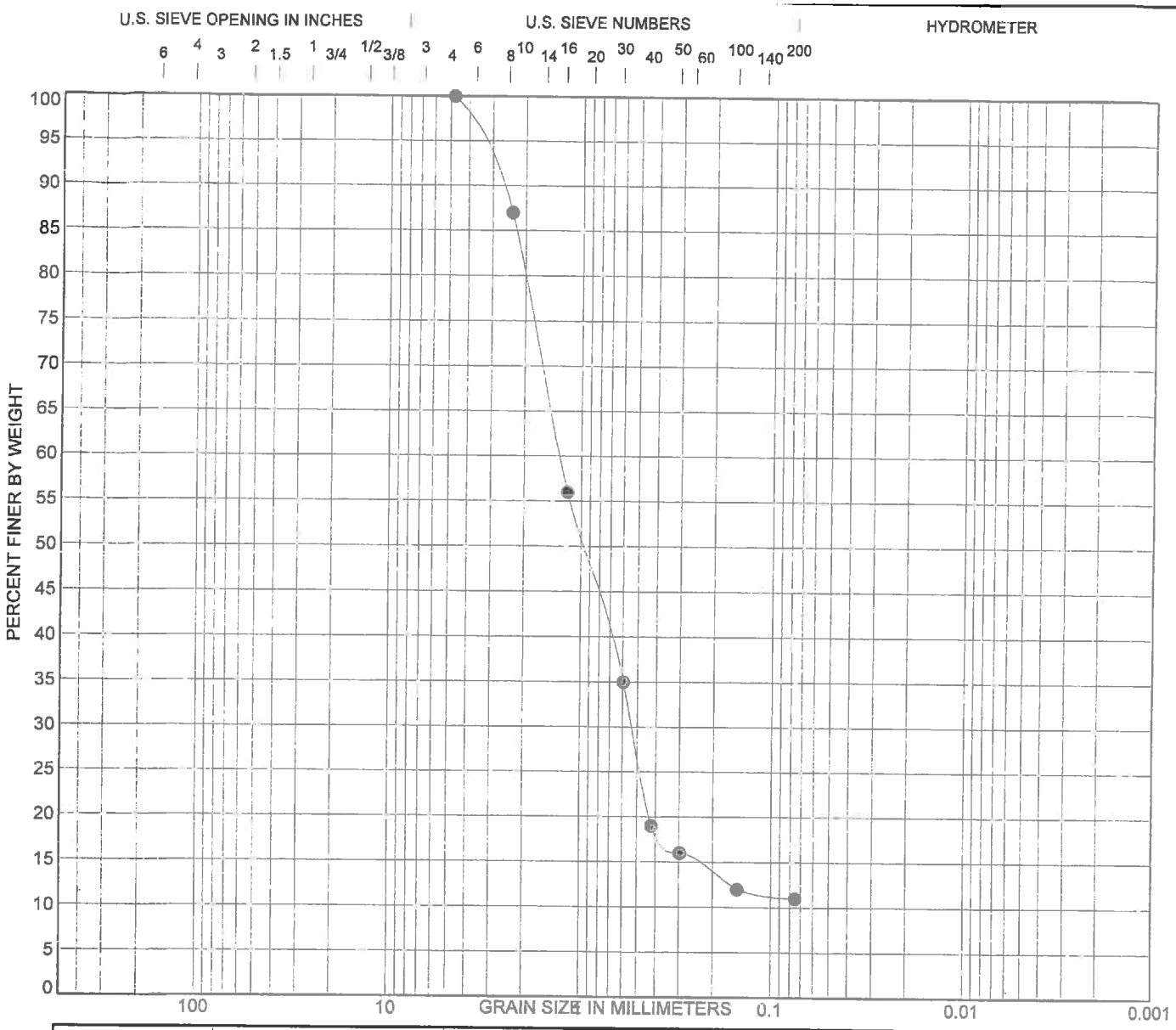
Project Name
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Project No. **14-31-124-01**

Drawing No. **B-5e**

APPENDIX B-1

PREVIOUS LABORATORY TESTING (2013)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Boring No.	Depth (ft)	Description	LL	PL	PI	Cc	Cu
●	**BH-B15**	**0-5**	**SAND (SP) WITH CLAY**				**5.85**	**34.18**

	Boring No.	Depth (ft)	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**BH-B15**	**0-5**	**4.75**	**1.29**	**0.534**		**0.0**	**89.0**	**11.0**	

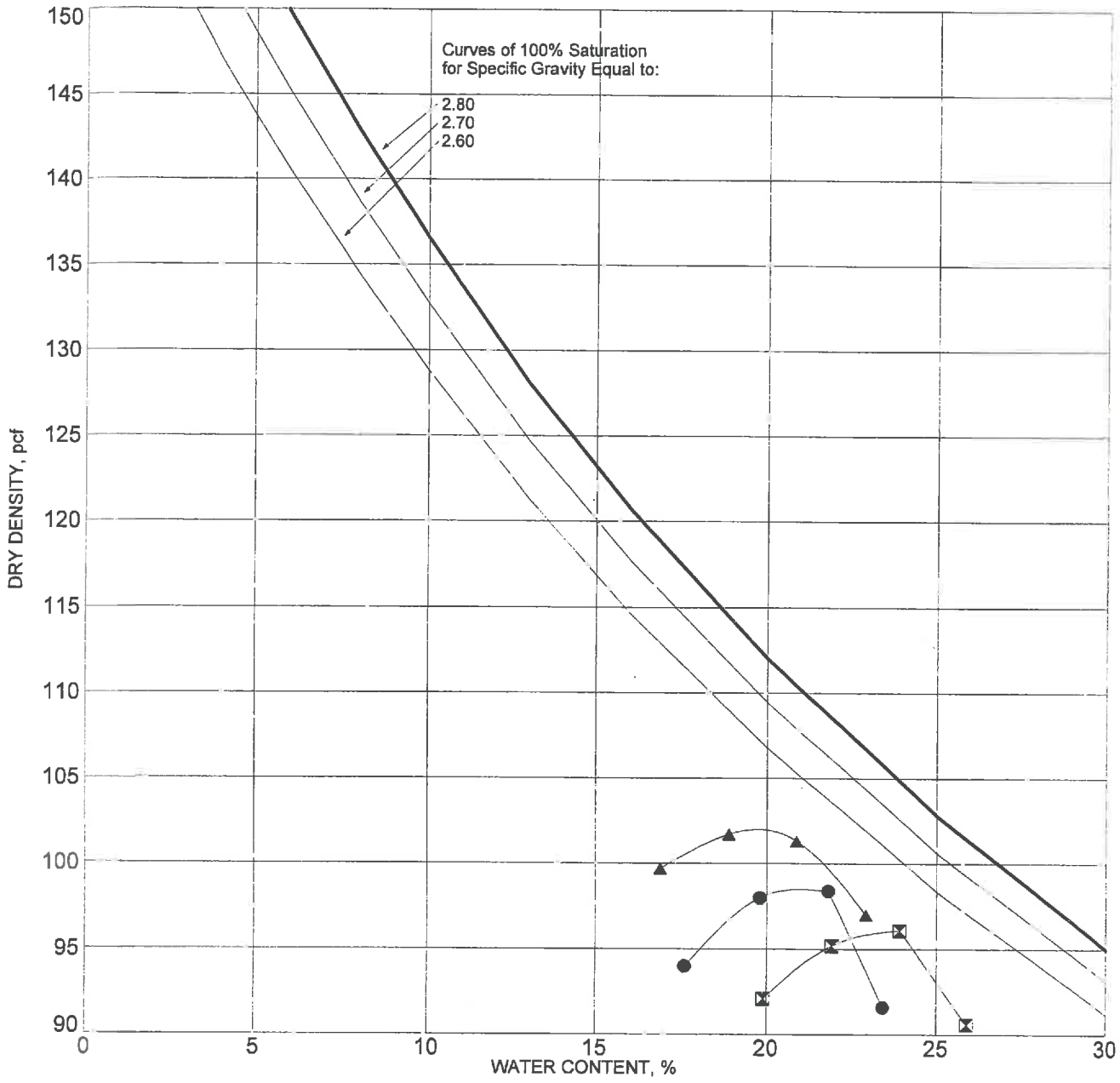
GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No.
13-31-116-01

Drawing No.
B2-1



SYMBOL	BORING NO.	DEPTH (ft)	DESCRIPTION	ASTM TEST METHOD	OPTIMUM WATER, %	MAXIMUM DRY DENSITY, pcf
●	BH-B1	0-5	SILTY SAND (SM)	D1557 Method B	20.8	99.2
⊠	BH-B10	15-20	BEDROCK: SILTSTONE - CLAYSTONE	D1557 Method B	23.3	97
▲	BH-B16	0-5	CLAYEY SAND (SC)	D1557 Method B	19.8	102.2

NOTE:

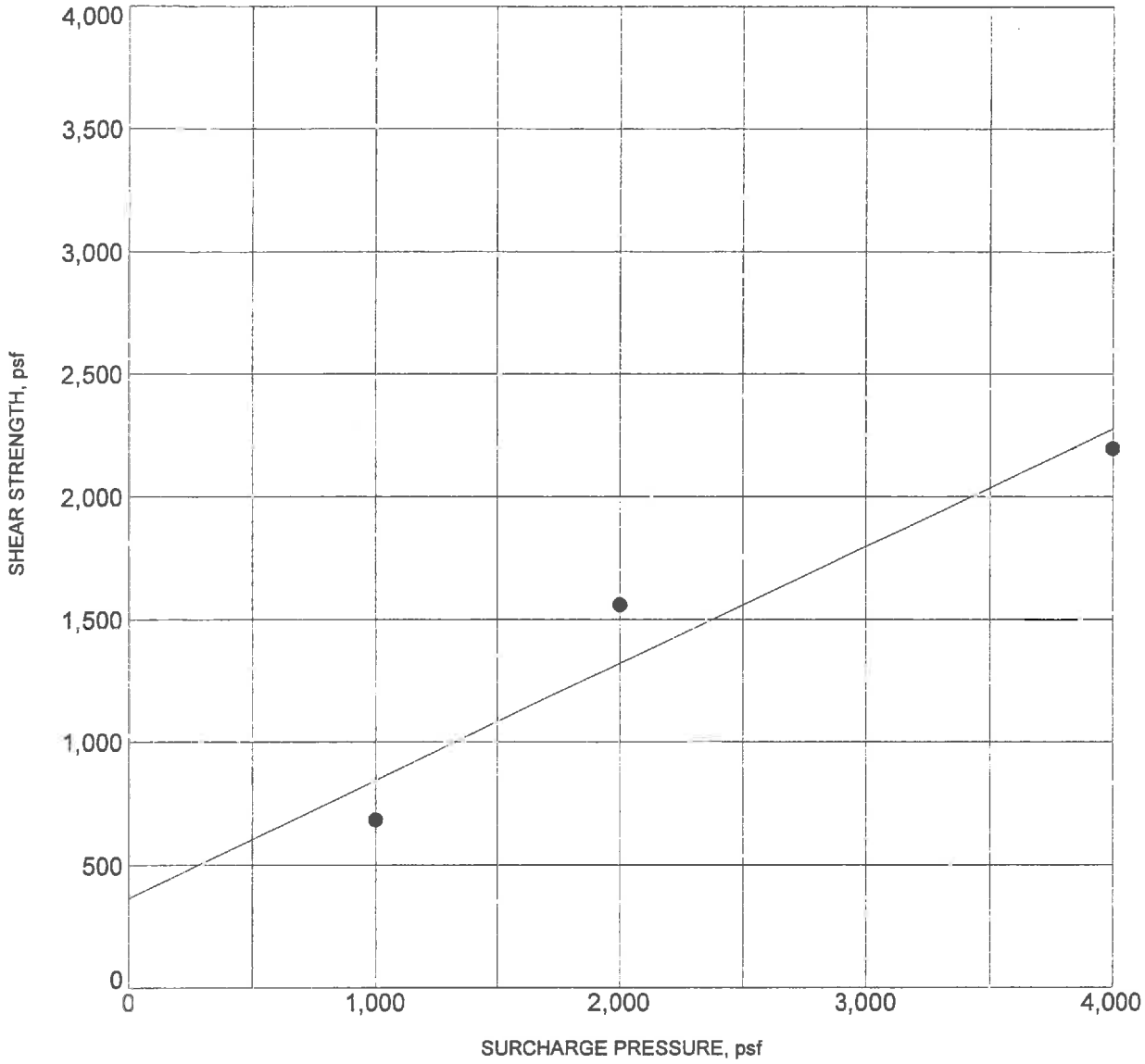
MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No.
13-31-116-01

Drawing No.
B2-2



BORING NO.	:	**BH-B2**	DEPTH (ft)	:	**50**
DESCRIPTION	:	**BEDROCK: SILTSTONE**			
COHESION (psf)	:	**350**	FRICTION ANGLE (degrees)		**26**
MOISTURE CONTENT (%)	:	**39.1**	DRY DENSITY (pcf)	:	**79.8**

NOTE: Ultimate Strength.

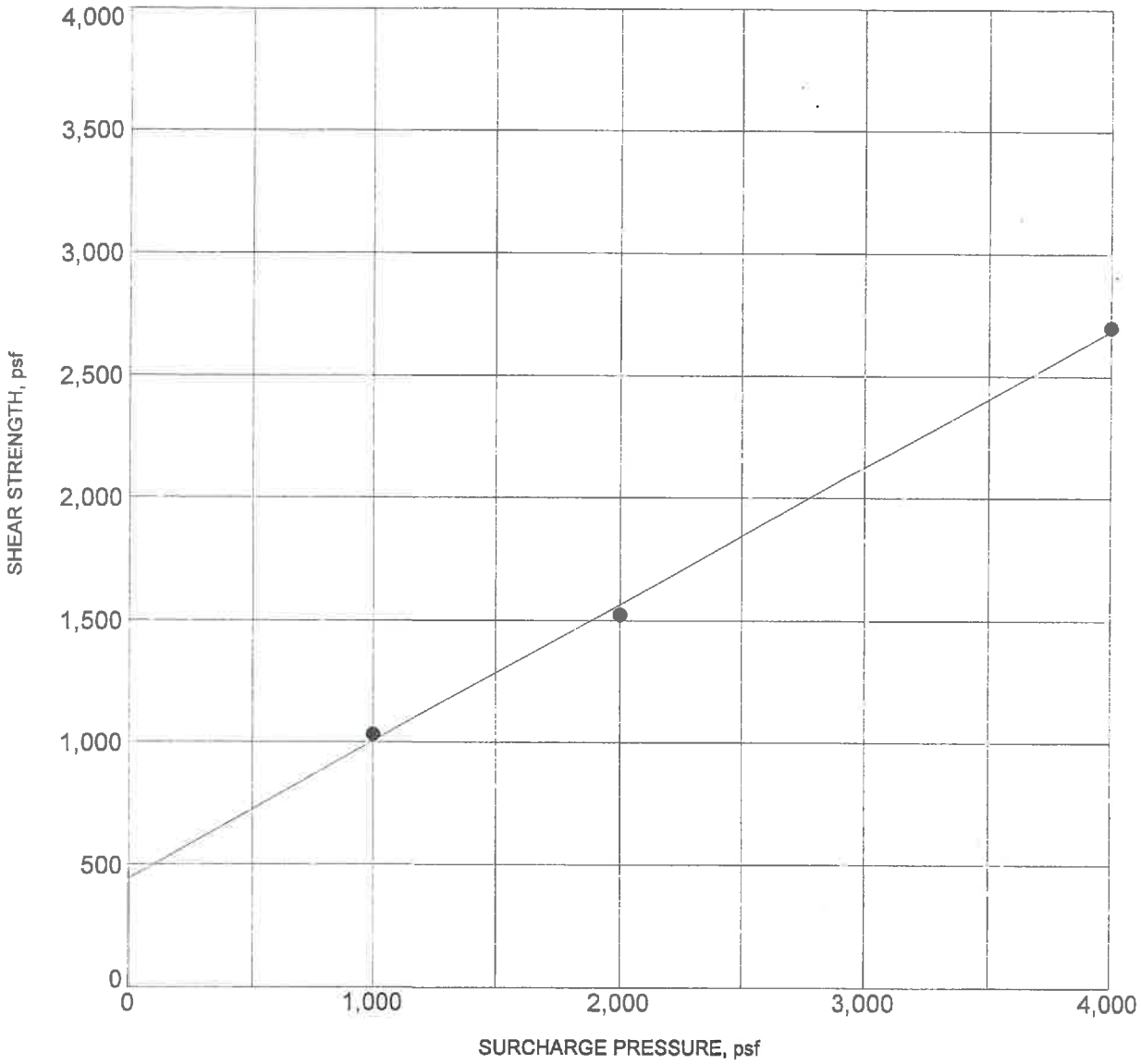
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-3a**



BORING NO.	:	**BH-B3**	DEPTH (ft)	:	**35**
DESCRIPTION	:	**BEDROCK: SILTSTONE**			
COHESION (psf)	:	**450**	FRICTION ANGLE (degrees)		**29**
MOISTURE CONTENT (%)	:	**33.7**	DRY DENSITY (pcf)	:	**85.7**

NOTE: Ultimate Strength.

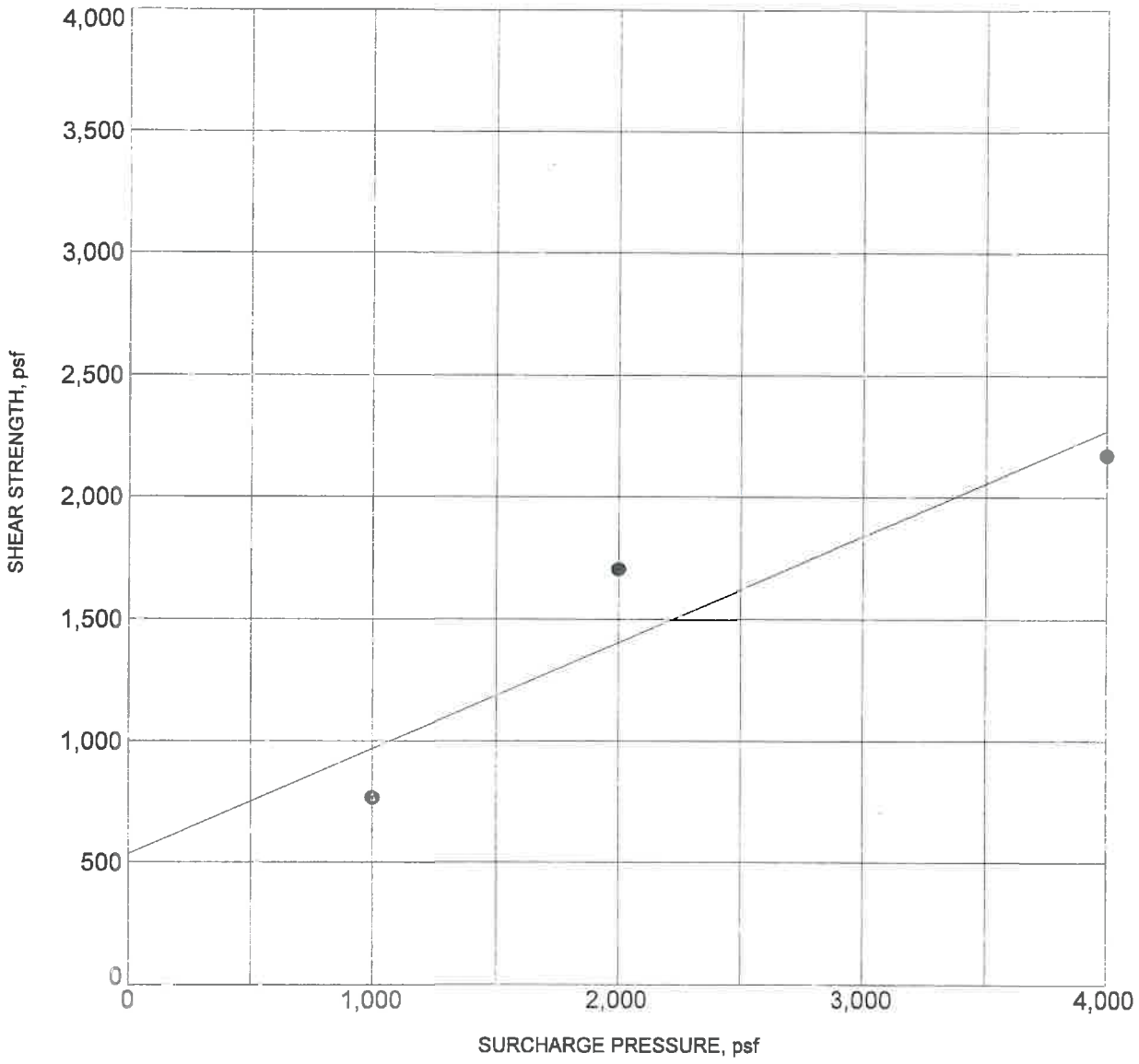
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-3b**



BORING NO.	:	**BH-B5**	DEPTH (ft)	:	**15**
DESCRIPTION	:	**BEDROCK: SILTSTONE**			
COHESION (psf)	:	**550**	FRICTION ANGLE (degrees)		**23**
MOISTURE CONTENT (%)	:	**32.6**	DRY DENSITY (pcf)	:	**83.3**

NOTE: Ultimate Strength.

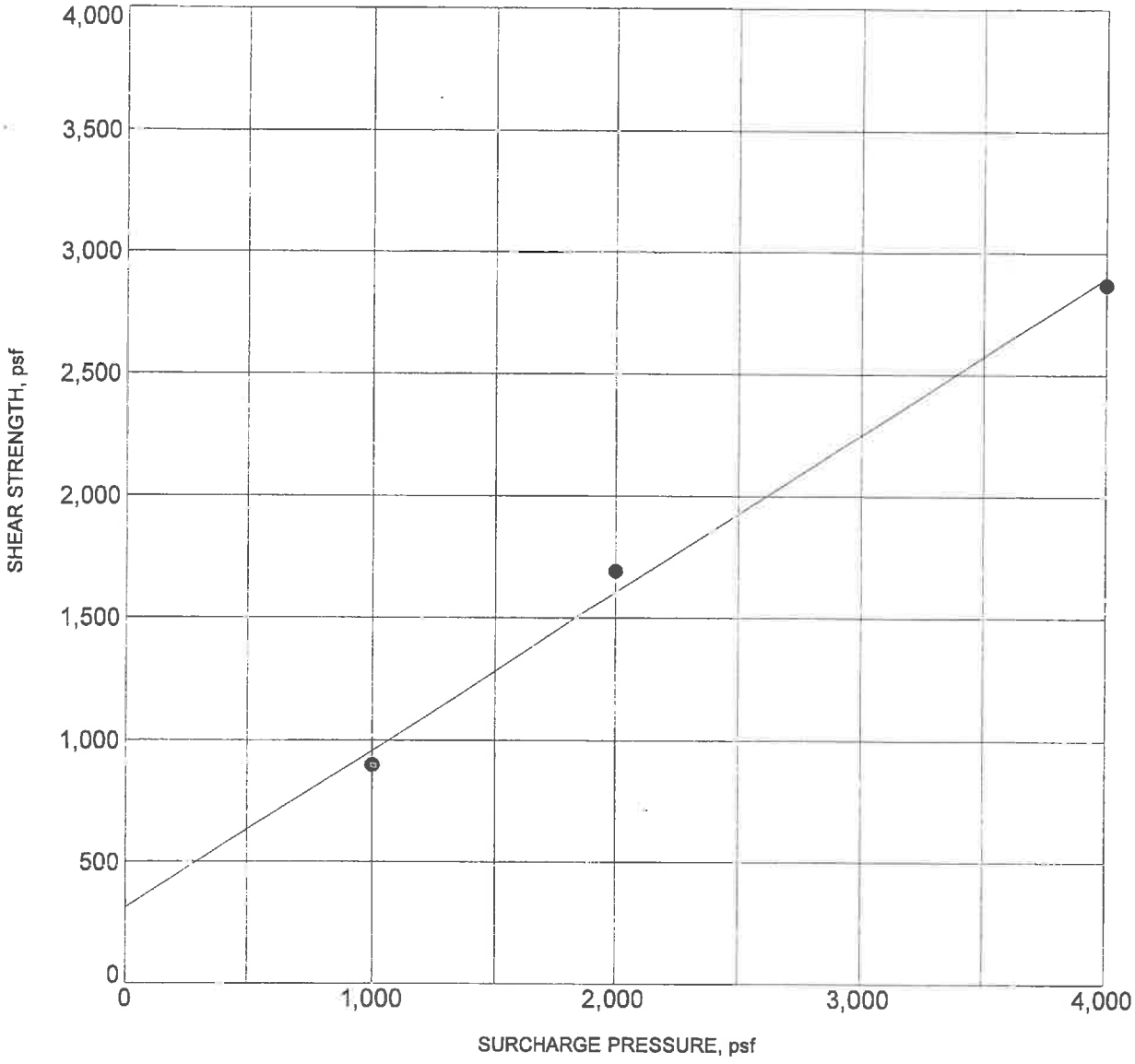
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-3c**



BORING NO.	:	**BH-B6**	DEPTH (ft)	:	**65**
DESCRIPTION	:	**BEDROCK: SILTSTONE, SANDSTONE AND SHALE**			
COHESION (psf)	:	**300**	FRICTION ANGLE (degrees)		**33**
MOISTURE CONTENT (%)	:	**34.0**	DRY DENSITY (pcf)	:	**85.3**

NOTE: Ultimate Strength.

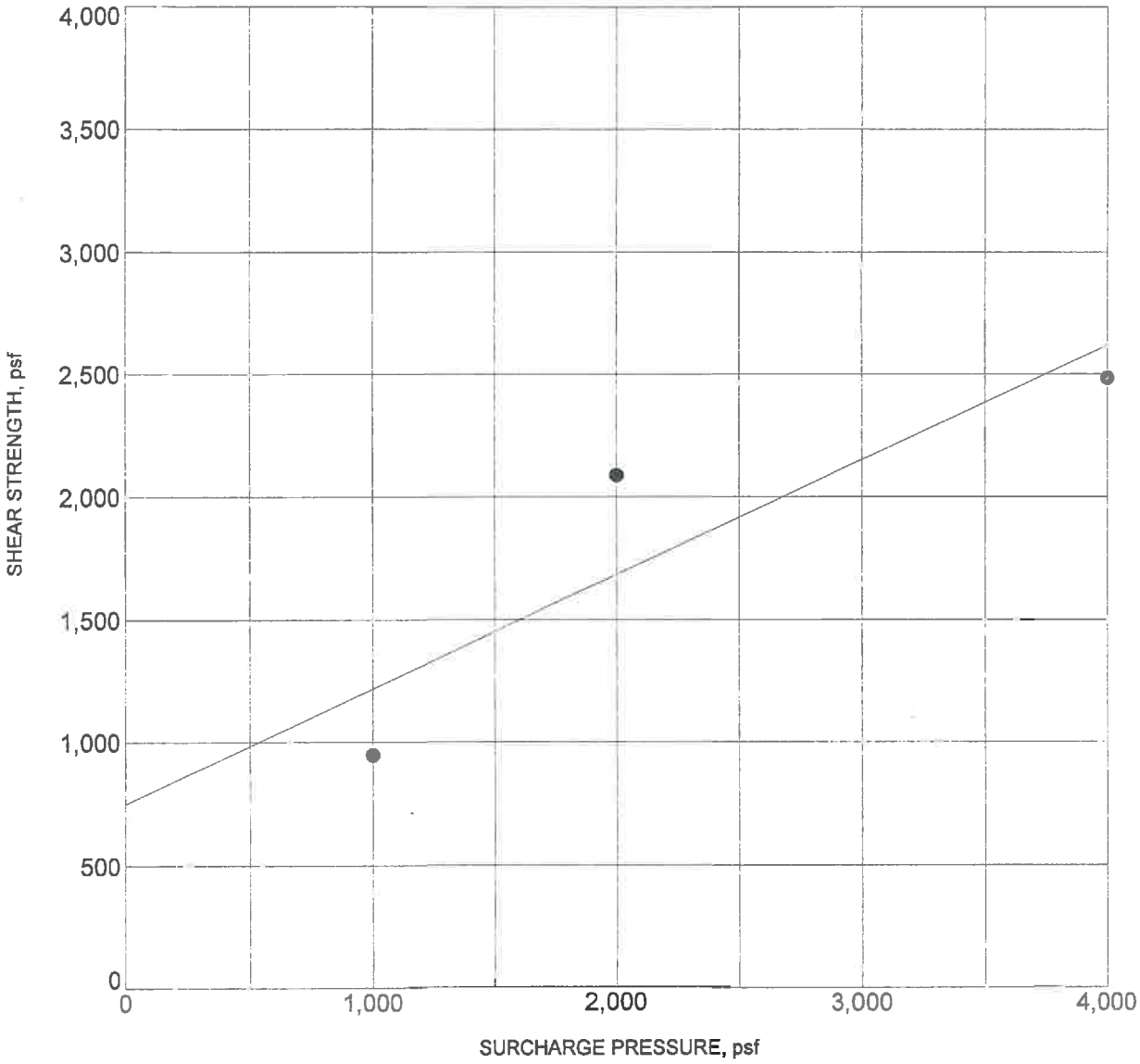
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No.
13-31-116-01

Drawing No.
B2-3d



BORING NO.	:	**BH-B7**	DEPTH (ft)	:	**75**
DESCRIPTION	:	**BEDROCK: SILTSTONE**			
COHESION (psf)	:	**750**	FRICTION ANGLE (degrees)		**25**
MOISTURE CONTENT (%)	:	**34.2**	DRY DENSITY (pcf)	:	**81.5**

NOTE: Ultimate Strength.

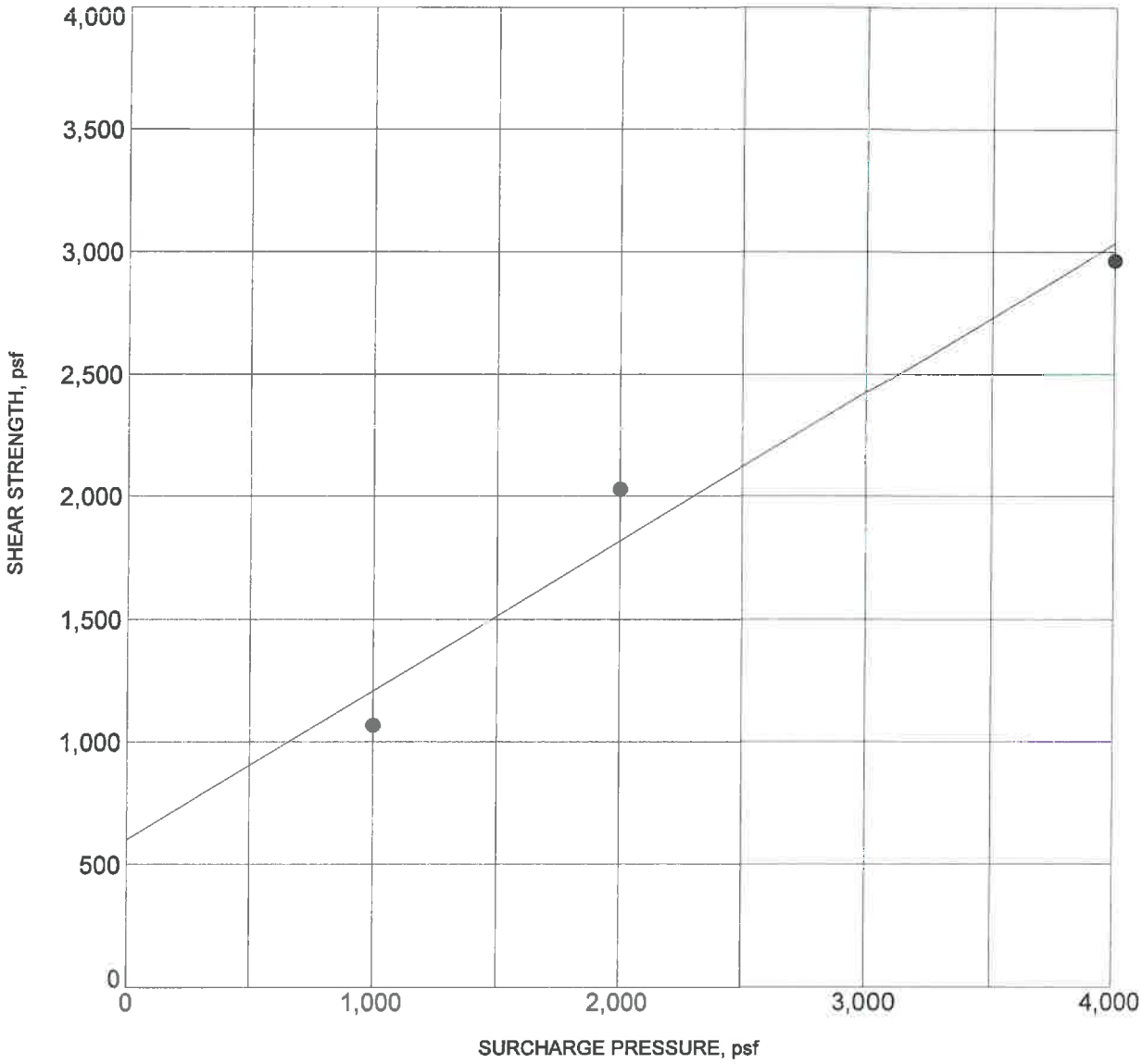
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No.
13-31-116-01

Drawing No.
B2-3e



BORING NO.	:	**BH-B10**	DEPTH (ft)	:	**15-20**
DESCRIPTION	:	**BEDROCK: SILTSTONE, CLAYSTONE AND SHALE**			
COHESION (psf)	:	**600**	FRICTION ANGLE (degrees)		**31**
MOISTURE CONTENT (%)	:	**31.9**	DRY DENSITY (pcf)	:	**82.3**

NOTE: Ultimate Strength, remolded to 90% relative compaction.

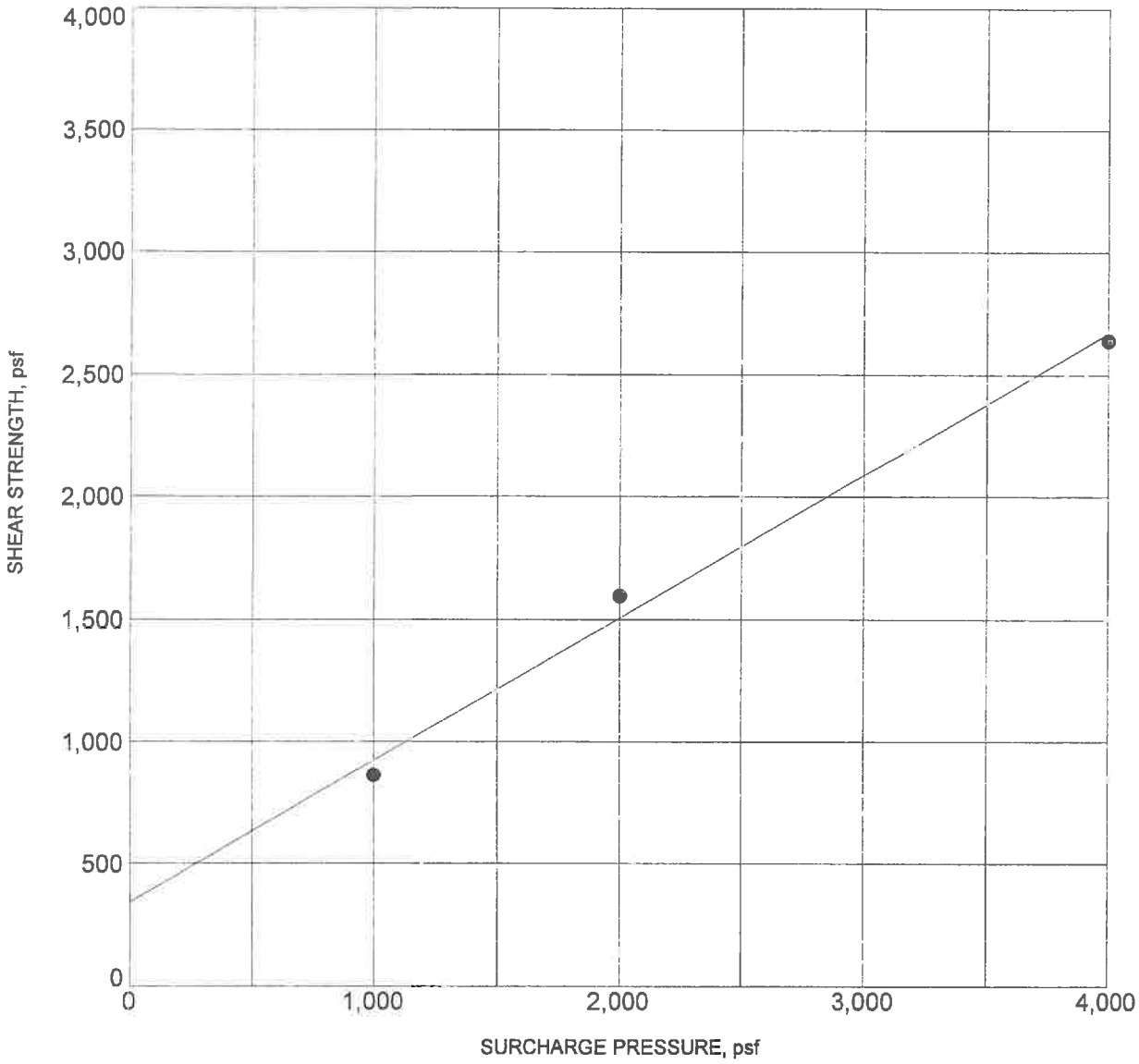
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-3f**



BORING NO.	:	**BH-B10**	DEPTH (ft)	:	**85**
DESCRIPTION	:	**BEDROCK: SILTSTONE, SANDSTONE AND SHALE**			
COHESION (psf)	:	**350**	FRICTION ANGLE (degrees)		**30**
MOISTURE CONTENT (%)	:	**40.3**	DRY DENSITY (pcf)	:	**76.9**

NOTE: Ultimate Strength.

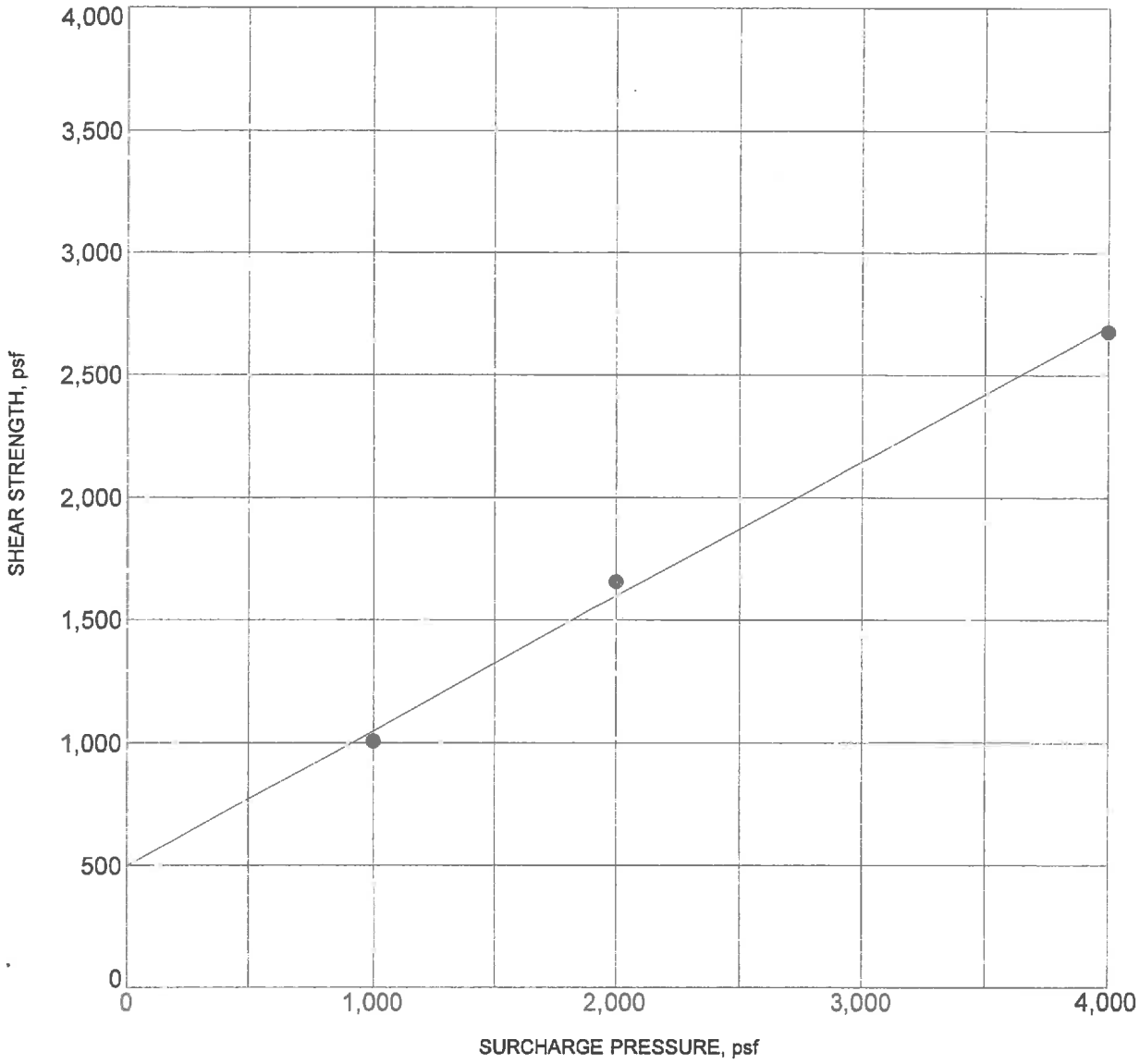
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-3g**



BORING NO.	:	**BH-B11**	DEPTH (ft)	:	**5**
DESCRIPTION	:	**SANDY CLAY (CL)**			
COHESION (psf)	:	**500**	FRICTION ANGLE (degrees)		**29**
MOISTURE CONTENT (%)	:	**28.1**	DRY DENSITY (pcf)	:	**83.1**

.NOTE: Ultimate Strength.

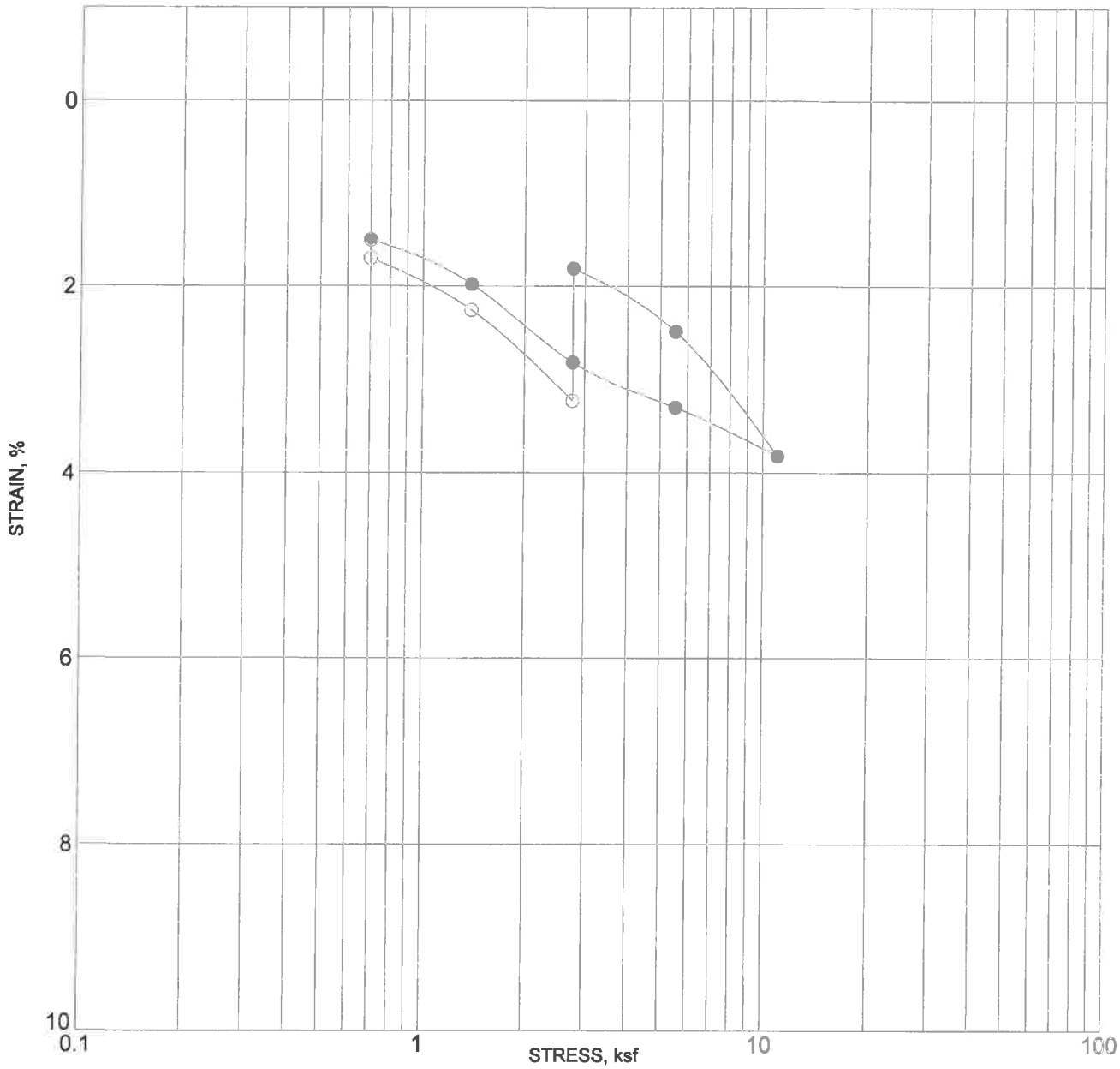
DIRECT SHEAR TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-3h**



BORING NO. :	BH-B1	DEPTH (ft) :	10
DESCRIPTION :	BEDROCK: SILTSTONE AND SHALE		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	29.9	91.3		
FINAL	18.1	96.4		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

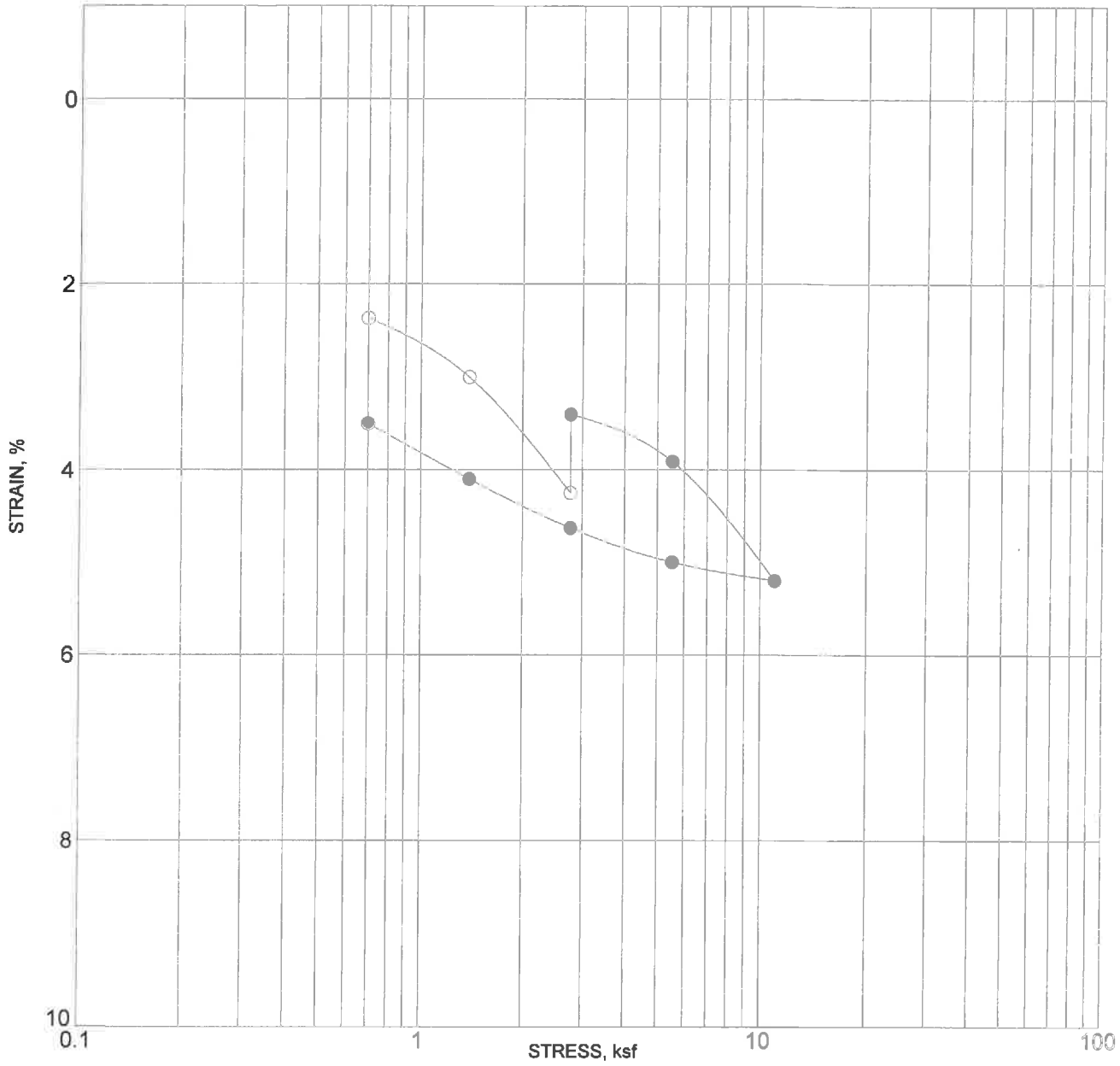
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. **13-31-116-01**

Drawing No. **B2-4a**



BORING NO. :	BH-B11	DEPTH (ft) :	15
DESCRIPTION :	SANDY CLAY (CL)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	24.2	100.3		
FINAL	18.1	105.9		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

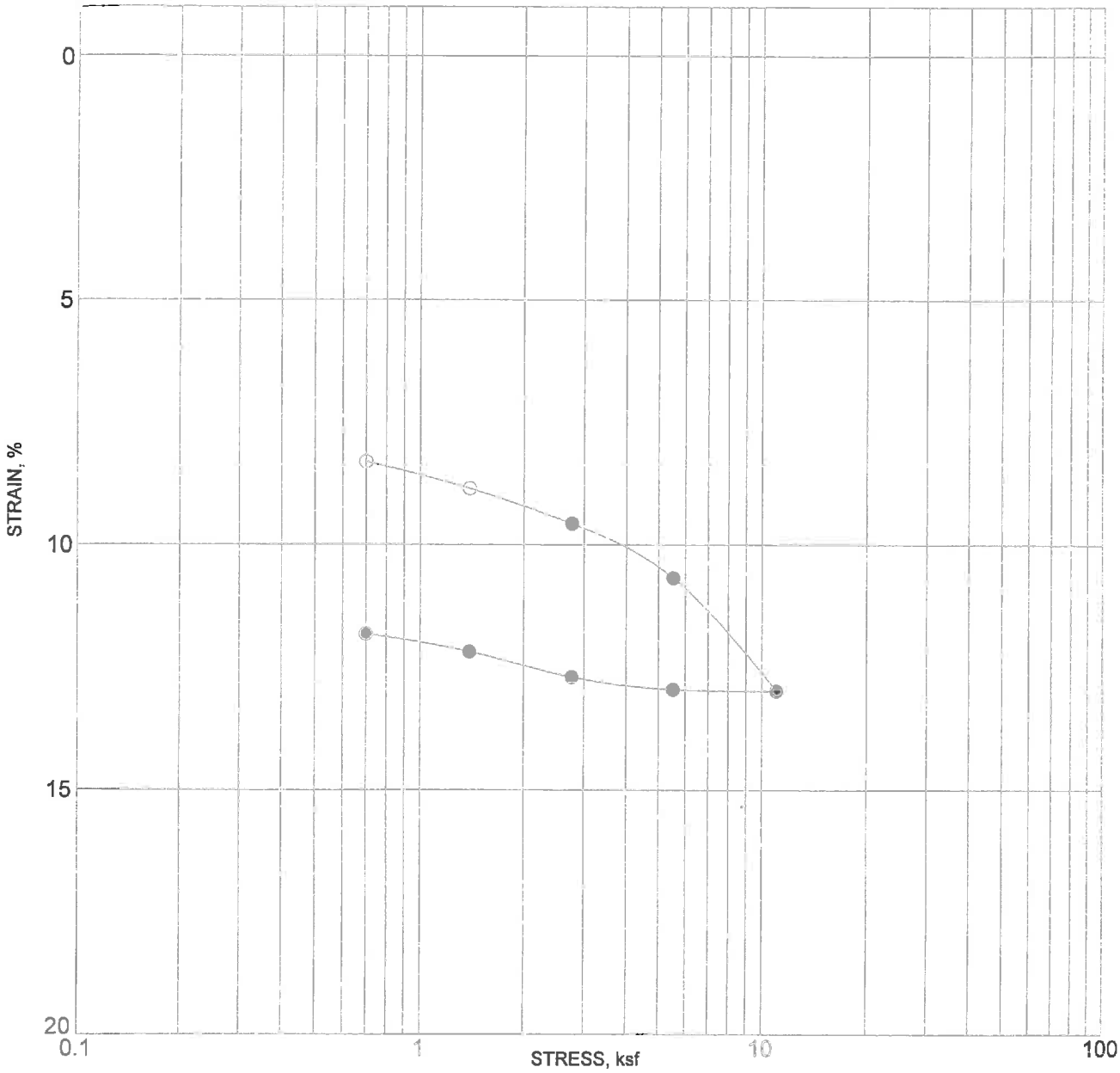
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. B2-4b



BORING NO. :	BH-B12	DEPTH (ft) :	20
DESCRIPTION :	CLAY (CL)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	35	91.7		
FINAL	18.1	96.8		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

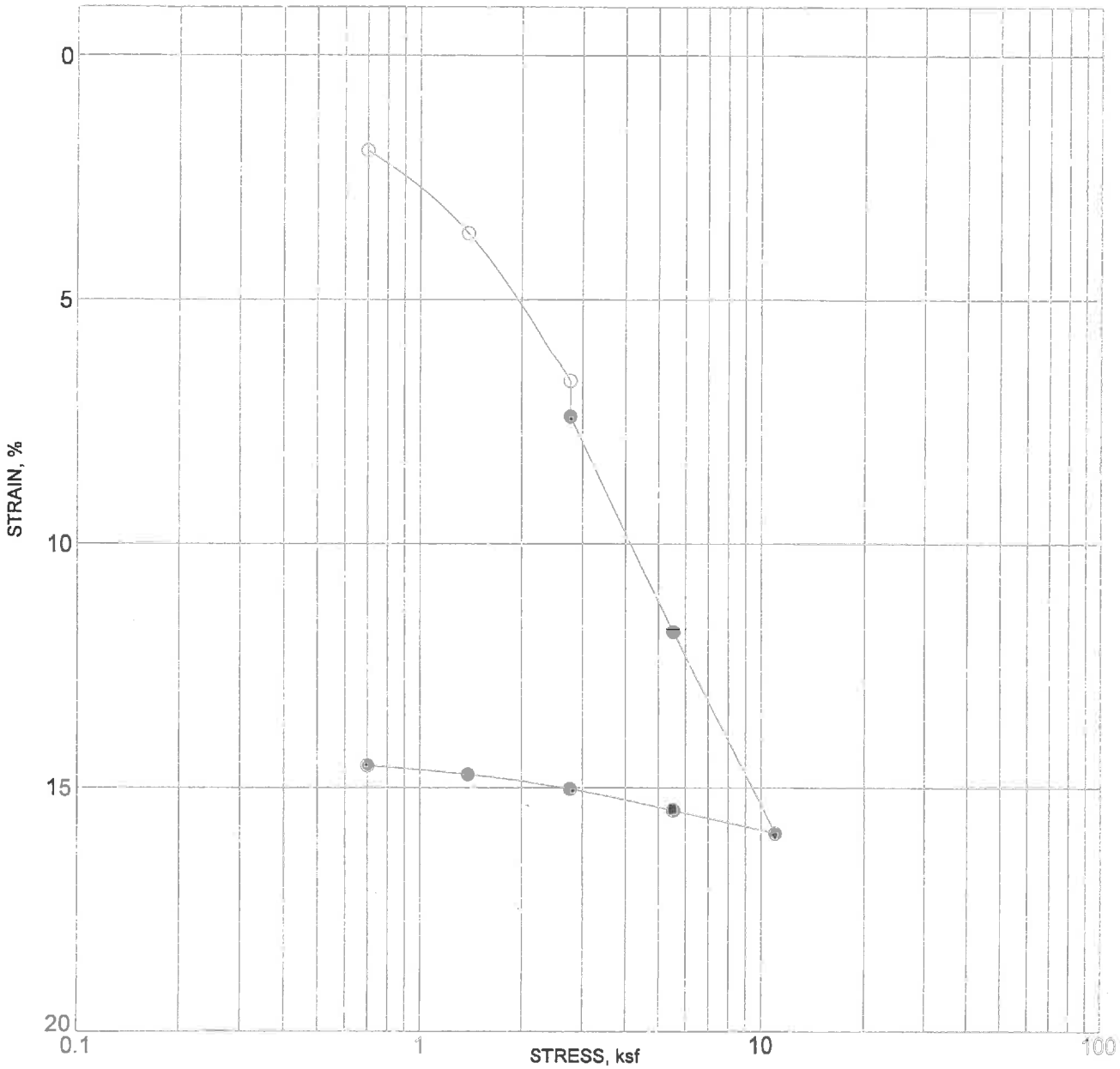
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. B2-4c



BORING NO. :	BH-B13	DEPTH (ft) :	10
DESCRIPTION :	CLAY (CL)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	36.1	77.6		
FINAL	18.1	81.9		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

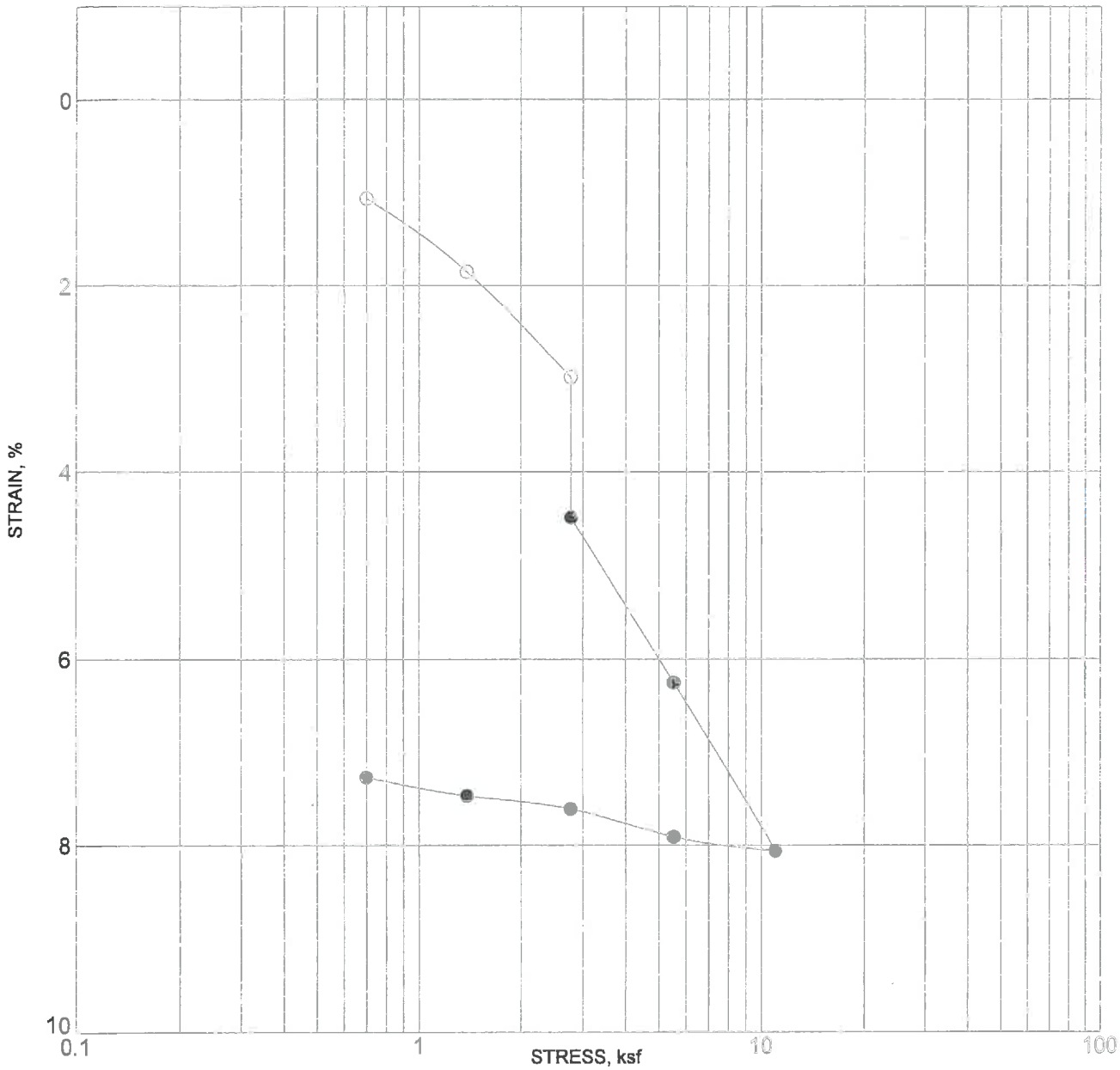
CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. B2-4d



BORING NO. :	BH-B16	DEPTH (ft) :	10
DESCRIPTION :	CLAYEY SAND (SC)		

	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	5.5	123.3		
FINAL	18.1	130.1		

NOTE: SOLID CIRCLES INDICATE READINGS AFTER ADDITION OF WATER

CONSOLIDATION TEST RESULTS

Converse Consultants

Project Name
MT. SAC HILLTOP REMOVAL
WALNUT, CALIFORNIA

Project No. 13-31-116-01

Drawing No. B2-4e

APPENDIX C

LIQUEFACTION/SEISMIC SETTLEMENT ANALYSIS

APPENDIX C

LIQUEFACTION/SEISMIC SETTLEMENT ANALYSIS

Liquefaction is defined as the phenomenon where a soil mass exhibits a substantial reduction in its shear strength. This strength reduction is due to the development of excess pore pressure in a soil mass caused by earthquake induced ground motions. Saturated soils behave temporarily as a viscous fluid (liquefaction) and, consequently, lose their capacity to support the structures founded on them. The potential for liquefaction decreases with increasing clay and gravel content, but increases as the ground acceleration and duration of shaking increase. Liquefaction potential has been found to be the greatest where the groundwater level and loose sands occur within 50 feet of the ground surface.

Our liquefaction analyses are based on the *Special Publication 117A: Guidelines for Evaluating and Mitigating Seismic Hazards in California* (9/2008), *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California* (3/1999), and *2013 California Building Code*.

The subsurface data obtained from exploratory borings were used to evaluate the liquefaction/seismic settlement potential of the area. The Log of Borings is presented in Appendix A, *Field Exploration*. The liquefaction potential and seismic settlement analyses were performed utilizing data obtained from borings BH-14 and BH-26 for the upper 50 feet of soil. The analyses were performed using *LiquefyPro,* Version 5.8n, 2012, by Civil Tech Software. The following seismic parameters are used for liquefaction potential analyses.

Table No. C-1 Seismic Parameters Used in Liquefaction Analysis

Groundwater Depth* (feet)	Earthquake Magnitude** Mw	Peak Ground Acceleration*** (g)
17	6.69	0.77

* Based on groundwater encountered during exploration
** Based on the 2008 NSHMP PSHA Interactive Deaggregation web site for a return period of 2475 years
*** Based on PGA_M per section 21.5 of ASCE 7-10

The results of liquefaction analyses indicate the project site is not susceptible to liquefaction. The estimated potential seismically induced settlement ranges from approximately 0.67 to 0.87 inches with potential differential settlement ranging from approximately 0.34 to 0.44 inches. The project structural engineer should consider the effects of seismically-induced settlement in the foundation design.

Table No. C-2, Seismic Settlement Analyses Summary

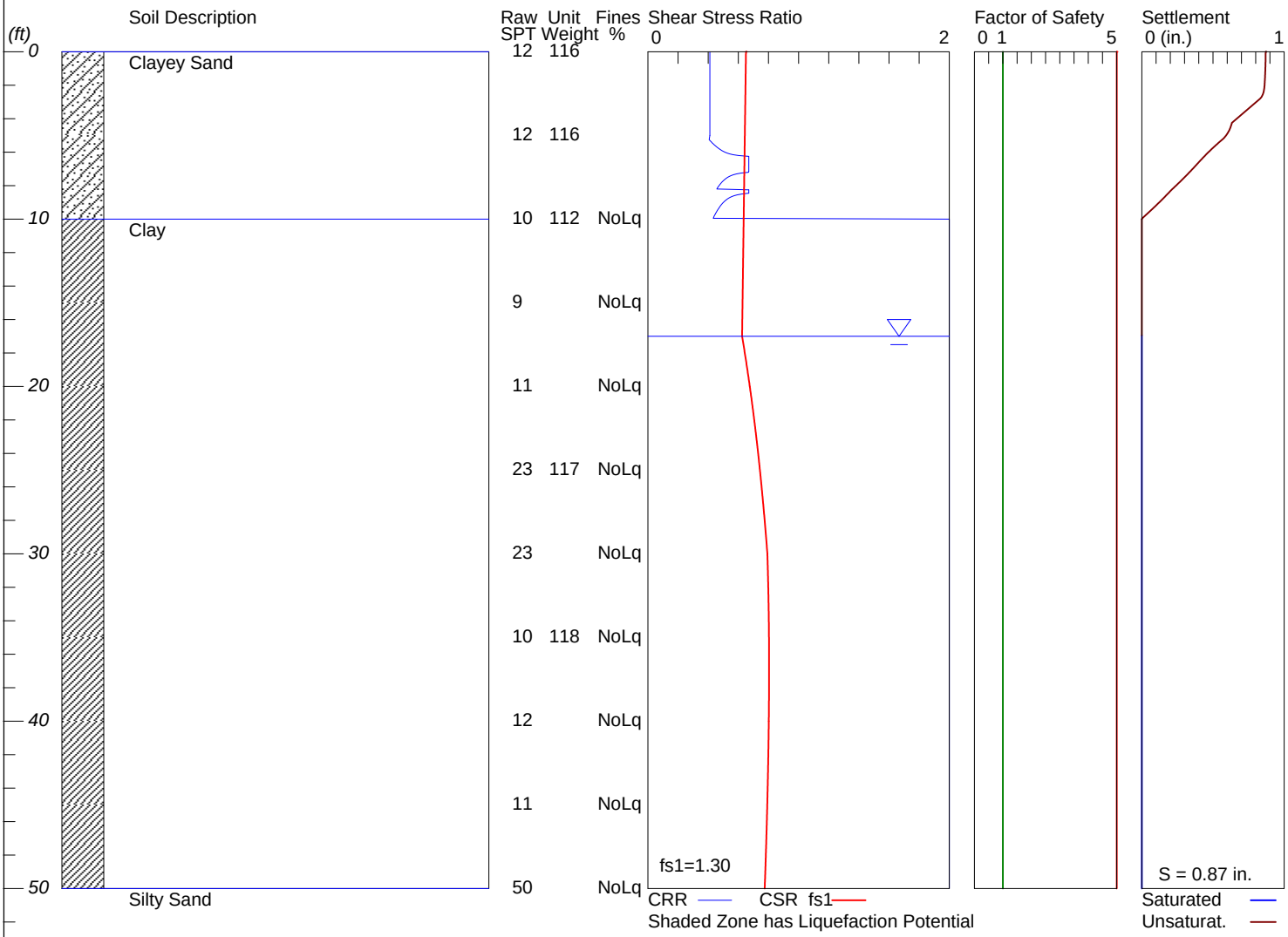
Boring No.	Building/Structure	Seismic Settlement of Upper 50 Feet (inches)
BH-14	Scoreboard	0.87
BH-26	Gateway Building	0.67

LIQUEFACTION ANALYSIS

Mt. SAC Athletics Complex East

Hole No.=BH-14 Water Depth=17 ft Surface Elev.=732

Magnitude=6.69
Acceleration=0.77g



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LIQUEFACTION ANALYSIS SUMMARY
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Font: Courier New, Regular, Size 8 is recommended for this report.
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Input File Name: UNTITLED
Title: Mt. SAC Athletics Complex East
Subtitle: 14-31-124-01

Surface Elev.=732
Hole No.=BH-14
Depth of Hole= 50.00 ft
Water Table during Earthquake= 17.00 ft
Water Table during In-Situ Testing= 17.00 ft
Max. Acceleration= 0.77 g
Earthquake Magnitude= 6.69

Input Data:
Surface Elev.=732
Hole No.=BH-14
Depth of Hole=50.00 ft
Water Table during Earthquake= 17.00 ft
Water Table during In-Situ Testing= 17.00 ft
Max. Acceleration=0.77 g
Earthquake Magnitude=6.69
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: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1.15
8. Sampling Method, Cs= 1.2
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	12.00	116.00	0.00
5.00	12.00	116.00	0.00
10.00	10.00	112.00	NoLiq
15.00	9.00	112.00	NoLiq
20.00	11.00	112.00	NoLiq
25.00	23.00	117.00	NoLiq
30.00	23.00	117.00	NoLiq
35.00	10.00	118.00	NoLiq
40.00	12.00	118.00	NoLiq
45.00	11.00	118.00	NoLiq
50.00	50.00	118.00	NoLiq

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.87 in.
Total Settlement of Saturated and Unsaturated Sands=0.87 in.
Differential Settlement=0.435 to 0.574 in.

Depth	CRRm	CSRfs	F.S.	S_sat.	S_dry	S_all

ft				in.	in.	Liquefy.sum in.
0.00	0.41	0.65	5.00	0.00	0.87	0.87
0.05	0.41	0.65	5.00	0.00	0.87	0.87
0.10	0.41	0.65	5.00	0.00	0.87	0.87
0.15	0.41	0.65	5.00	0.00	0.87	0.87
0.20	0.41	0.65	5.00	0.00	0.87	0.87
0.25	0.41	0.65	5.00	0.00	0.87	0.87
0.30	0.41	0.65	5.00	0.00	0.87	0.87
0.35	0.41	0.65	5.00	0.00	0.87	0.87
0.40	0.41	0.65	5.00	0.00	0.87	0.87
0.45	0.41	0.65	5.00	0.00	0.87	0.87
0.50	0.41	0.65	5.00	0.00	0.87	0.87
0.55	0.41	0.65	5.00	0.00	0.87	0.87
0.60	0.41	0.65	5.00	0.00	0.87	0.87
0.65	0.41	0.65	5.00	0.00	0.87	0.87
0.70	0.41	0.65	5.00	0.00	0.87	0.87
0.75	0.41	0.65	5.00	0.00	0.87	0.87
0.80	0.41	0.65	5.00	0.00	0.87	0.87
0.85	0.41	0.65	5.00	0.00	0.87	0.87
0.90	0.41	0.65	5.00	0.00	0.87	0.87
0.95	0.41	0.65	5.00	0.00	0.87	0.87
1.00	0.41	0.65	5.00	0.00	0.87	0.87
1.05	0.41	0.65	5.00	0.00	0.87	0.87
1.10	0.41	0.65	5.00	0.00	0.87	0.87
1.15	0.41	0.65	5.00	0.00	0.87	0.87
1.20	0.41	0.65	5.00	0.00	0.87	0.87
1.25	0.41	0.65	5.00	0.00	0.87	0.87
1.30	0.41	0.65	5.00	0.00	0.87	0.87
1.35	0.41	0.65	5.00	0.00	0.87	0.87
1.40	0.41	0.65	5.00	0.00	0.87	0.87
1.45	0.41	0.65	5.00	0.00	0.87	0.87
1.50	0.41	0.65	5.00	0.00	0.87	0.87
1.55	0.41	0.65	5.00	0.00	0.87	0.87
1.60	0.41	0.65	5.00	0.00	0.87	0.87
1.65	0.41	0.65	5.00	0.00	0.86	0.86
1.70	0.41	0.65	5.00	0.00	0.86	0.86
1.75	0.41	0.65	5.00	0.00	0.86	0.86
1.80	0.41	0.65	5.00	0.00	0.86	0.86
1.85	0.41	0.65	5.00	0.00	0.86	0.86
1.90	0.41	0.65	5.00	0.00	0.86	0.86
1.95	0.41	0.65	5.00	0.00	0.86	0.86
2.00	0.41	0.65	5.00	0.00	0.86	0.86
2.05	0.41	0.65	5.00	0.00	0.86	0.86
2.10	0.41	0.65	5.00	0.00	0.86	0.86
2.15	0.41	0.65	5.00	0.00	0.86	0.86
2.20	0.41	0.65	5.00	0.00	0.86	0.86
2.25	0.41	0.65	5.00	0.00	0.86	0.86
2.30	0.41	0.65	5.00	0.00	0.86	0.86
2.35	0.41	0.65	5.00	0.00	0.86	0.86
2.40	0.41	0.65	5.00	0.00	0.86	0.86
2.45	0.41	0.65	5.00	0.00	0.85	0.85
2.50	0.41	0.65	5.00	0.00	0.85	0.85
2.55	0.41	0.65	5.00	0.00	0.85	0.85
2.60	0.41	0.65	5.00	0.00	0.85	0.85
2.65	0.41	0.65	5.00	0.00	0.84	0.84
2.70	0.41	0.65	5.00	0.00	0.84	0.84
2.75	0.41	0.65	5.00	0.00	0.84	0.84
2.80	0.41	0.65	5.00	0.00	0.83	0.83
2.85	0.41	0.65	5.00	0.00	0.82	0.82
2.90	0.41	0.65	5.00	0.00	0.82	0.82
2.95	0.41	0.65	5.00	0.00	0.81	0.81
3.00	0.41	0.65	5.00	0.00	0.80	0.80
3.05	0.41	0.65	5.00	0.00	0.80	0.80
3.10	0.41	0.65	5.00	0.00	0.79	0.79
3.15	0.41	0.65	5.00	0.00	0.78	0.78
3.20	0.41	0.65	5.00	0.00	0.78	0.78

						Liquefy.sum
3.25	0.41	0.65	5.00	0.00	0.77	0.77
3.30	0.41	0.65	5.00	0.00	0.76	0.76
3.35	0.41	0.65	5.00	0.00	0.76	0.76
3.40	0.41	0.65	5.00	0.00	0.75	0.75
3.45	0.41	0.65	5.00	0.00	0.74	0.74
3.50	0.41	0.65	5.00	0.00	0.74	0.74
3.55	0.41	0.65	5.00	0.00	0.73	0.73
3.60	0.41	0.65	5.00	0.00	0.72	0.72
3.65	0.41	0.65	5.00	0.00	0.71	0.71
3.70	0.41	0.65	5.00	0.00	0.71	0.71
3.75	0.41	0.64	5.00	0.00	0.70	0.70
3.80	0.41	0.64	5.00	0.00	0.69	0.69
3.85	0.41	0.64	5.00	0.00	0.69	0.69
3.90	0.41	0.64	5.00	0.00	0.68	0.68
3.95	0.41	0.64	5.00	0.00	0.67	0.67
4.00	0.41	0.64	5.00	0.00	0.67	0.67
4.05	0.41	0.64	5.00	0.00	0.66	0.66
4.10	0.41	0.64	5.00	0.00	0.65	0.65
4.15	0.41	0.64	5.00	0.00	0.65	0.65
4.20	0.41	0.64	5.00	0.00	0.64	0.64
4.25	0.41	0.64	5.00	0.00	0.63	0.63
4.30	0.41	0.64	5.00	0.00	0.63	0.63
4.35	0.41	0.64	5.00	0.00	0.63	0.63
4.40	0.41	0.64	5.00	0.00	0.63	0.63
4.45	0.41	0.64	5.00	0.00	0.63	0.63
4.50	0.41	0.64	5.00	0.00	0.62	0.62
4.55	0.41	0.64	5.00	0.00	0.62	0.62
4.60	0.41	0.64	5.00	0.00	0.62	0.62
4.65	0.41	0.64	5.00	0.00	0.62	0.62
4.70	0.41	0.64	5.00	0.00	0.61	0.61
4.75	0.41	0.64	5.00	0.00	0.61	0.61
4.80	0.41	0.64	5.00	0.00	0.61	0.61
4.85	0.41	0.64	5.00	0.00	0.60	0.60
4.90	0.41	0.64	5.00	0.00	0.60	0.60
4.95	0.41	0.64	5.00	0.00	0.60	0.60
5.00	0.41	0.64	5.00	0.00	0.59	0.59
5.05	0.41	0.64	5.00	0.00	0.59	0.59
5.10	0.41	0.64	5.00	0.00	0.58	0.58
5.15	0.41	0.64	5.00	0.00	0.58	0.58
5.20	0.41	0.64	5.00	0.00	0.57	0.57
5.25	0.41	0.64	5.00	0.00	0.56	0.56
5.30	0.41	0.64	5.00	0.00	0.56	0.56
5.35	0.42	0.64	5.00	0.00	0.55	0.55
5.40	0.42	0.64	5.00	0.00	0.54	0.54
5.45	0.43	0.64	5.00	0.00	0.54	0.54
5.50	0.43	0.64	5.00	0.00	0.53	0.53
5.55	0.44	0.64	5.00	0.00	0.52	0.52
5.60	0.45	0.64	5.00	0.00	0.52	0.52
5.65	0.45	0.64	5.00	0.00	0.51	0.51
5.70	0.46	0.64	5.00	0.00	0.51	0.51
5.75	0.47	0.64	5.00	0.00	0.50	0.50
5.80	0.47	0.64	5.00	0.00	0.49	0.49
5.85	0.48	0.64	5.00	0.00	0.49	0.49
5.90	0.49	0.64	5.00	0.00	0.48	0.48
5.95	0.50	0.64	5.00	0.00	0.47	0.47
6.00	0.51	0.64	5.00	0.00	0.47	0.47
6.05	0.52	0.64	5.00	0.00	0.46	0.46
6.10	0.54	0.64	5.00	0.00	0.46	0.46
6.15	0.56	0.64	5.00	0.00	0.45	0.45
6.20	0.60	0.64	5.00	0.00	0.44	0.44
6.25	0.67	0.64	5.00	0.00	0.44	0.44
6.30	0.67	0.64	5.00	0.00	0.43	0.43
6.35	0.67	0.64	5.00	0.00	0.43	0.43
6.40	0.67	0.64	5.00	0.00	0.42	0.42
6.45	0.67	0.64	5.00	0.00	0.42	0.42
6.50	0.67	0.64	5.00	0.00	0.41	0.41
6.55	0.67	0.64	5.00	0.00	0.41	0.41

						Liquefy.sum
6.60	0.67	0.64	5.00	0.00	0.40	0.40
6.65	0.67	0.64	5.00	0.00	0.39	0.39
6.70	0.67	0.64	5.00	0.00	0.39	0.39
6.75	0.67	0.64	5.00	0.00	0.38	0.38
6.80	0.67	0.64	5.00	0.00	0.38	0.38
6.85	0.67	0.64	5.00	0.00	0.37	0.37
6.90	0.67	0.64	5.00	0.00	0.37	0.37
6.95	0.67	0.64	5.00	0.00	0.36	0.36
7.00	0.67	0.64	5.00	0.00	0.36	0.36
7.05	0.67	0.64	5.00	0.00	0.35	0.35
7.10	0.67	0.64	5.00	0.00	0.35	0.35
7.15	0.67	0.64	5.00	0.00	0.34	0.34
7.20	0.67	0.64	5.00	0.00	0.33	0.33
7.25	0.62	0.64	5.00	0.00	0.33	0.33
7.30	0.59	0.64	5.00	0.00	0.32	0.32
7.35	0.57	0.64	5.00	0.00	0.32	0.32
7.40	0.55	0.64	5.00	0.00	0.31	0.31
7.45	0.54	0.64	5.00	0.00	0.31	0.31
7.50	0.53	0.64	5.00	0.00	0.30	0.30
7.55	0.52	0.64	5.00	0.00	0.29	0.29
7.60	0.51	0.64	5.00	0.00	0.29	0.29
7.65	0.51	0.64	5.00	0.00	0.28	0.28
7.70	0.50	0.64	5.00	0.00	0.28	0.28
7.75	0.50	0.64	5.00	0.00	0.27	0.27
7.80	0.49	0.64	5.00	0.00	0.26	0.26
7.85	0.49	0.64	5.00	0.00	0.26	0.26
7.90	0.48	0.64	5.00	0.00	0.25	0.25
7.95	0.48	0.64	5.00	0.00	0.25	0.25
8.00	0.47	0.64	5.00	0.00	0.24	0.24
8.05	0.47	0.64	5.00	0.00	0.23	0.23
8.10	0.46	0.64	5.00	0.00	0.23	0.23
8.15	0.46	0.64	5.00	0.00	0.22	0.22
8.20	0.46	0.64	5.00	0.00	0.21	0.21
8.25	0.67	0.64	5.00	0.00	0.21	0.21
8.30	0.67	0.64	5.00	0.00	0.20	0.20
8.35	0.67	0.64	5.00	0.00	0.20	0.20
8.40	0.67	0.64	5.00	0.00	0.19	0.19
8.45	0.67	0.64	5.00	0.00	0.19	0.19
8.50	0.62	0.64	5.00	0.00	0.18	0.18
8.55	0.59	0.64	5.00	0.00	0.17	0.17
8.60	0.57	0.64	5.00	0.00	0.17	0.17
8.65	0.56	0.64	5.00	0.00	0.16	0.16
8.70	0.55	0.64	5.00	0.00	0.16	0.16
8.75	0.54	0.64	5.00	0.00	0.15	0.15
8.80	0.53	0.64	5.00	0.00	0.15	0.15
8.85	0.52	0.64	5.00	0.00	0.14	0.14
8.90	0.51	0.64	5.00	0.00	0.13	0.13
8.95	0.51	0.64	5.00	0.00	0.13	0.13
9.00	0.50	0.64	5.00	0.00	0.12	0.12
9.05	0.50	0.64	5.00	0.00	0.12	0.12
9.10	0.49	0.64	5.00	0.00	0.11	0.11
9.15	0.49	0.64	5.00	0.00	0.10	0.10
9.20	0.48	0.64	5.00	0.00	0.10	0.10
9.25	0.48	0.64	5.00	0.00	0.09	0.09
9.30	0.47	0.64	5.00	0.00	0.09	0.09
9.35	0.47	0.64	5.00	0.00	0.08	0.08
9.40	0.47	0.64	5.00	0.00	0.07	0.07
9.45	0.46	0.64	5.00	0.00	0.07	0.07
9.50	0.46	0.64	5.00	0.00	0.06	0.06
9.55	0.46	0.64	5.00	0.00	0.05	0.05
9.60	0.45	0.64	5.00	0.00	0.05	0.05
9.65	0.45	0.64	5.00	0.00	0.04	0.04
9.70	0.45	0.64	5.00	0.00	0.04	0.04
9.75	0.44	0.64	5.00	0.00	0.03	0.03
9.80	0.44	0.64	5.00	0.00	0.02	0.02
9.85	0.44	0.64	5.00	0.00	0.02	0.02
9.90	0.44	0.64	5.00	0.00	0.01	0.01

						Liquefy.sum
9.95	0.43	0.64	5.00	0.00	0.00	0.00
10.00	2.00	0.64	5.00	0.00	0.00	0.00
10.05	2.00	0.64	5.00	0.00	0.00	0.00
10.10	2.00	0.64	5.00	0.00	0.00	0.00
10.15	2.00	0.64	5.00	0.00	0.00	0.00
10.20	2.00	0.64	5.00	0.00	0.00	0.00
10.25	2.00	0.64	5.00	0.00	0.00	0.00
10.30	2.00	0.64	5.00	0.00	0.00	0.00
10.35	2.00	0.63	5.00	0.00	0.00	0.00
10.40	2.00	0.63	5.00	0.00	0.00	0.00
10.45	2.00	0.63	5.00	0.00	0.00	0.00
10.50	2.00	0.63	5.00	0.00	0.00	0.00
10.55	2.00	0.63	5.00	0.00	0.00	0.00
10.60	2.00	0.63	5.00	0.00	0.00	0.00
10.65	2.00	0.63	5.00	0.00	0.00	0.00
10.70	2.00	0.63	5.00	0.00	0.00	0.00
10.75	2.00	0.63	5.00	0.00	0.00	0.00
10.80	2.00	0.63	5.00	0.00	0.00	0.00
10.85	2.00	0.63	5.00	0.00	0.00	0.00
10.90	2.00	0.63	5.00	0.00	0.00	0.00
10.95	2.00	0.63	5.00	0.00	0.00	0.00
11.00	2.00	0.63	5.00	0.00	0.00	0.00
11.05	2.00	0.63	5.00	0.00	0.00	0.00
11.10	2.00	0.63	5.00	0.00	0.00	0.00
11.15	2.00	0.63	5.00	0.00	0.00	0.00
11.20	2.00	0.63	5.00	0.00	0.00	0.00
11.25	2.00	0.63	5.00	0.00	0.00	0.00
11.30	2.00	0.63	5.00	0.00	0.00	0.00
11.35	2.00	0.63	5.00	0.00	0.00	0.00
11.40	2.00	0.63	5.00	0.00	0.00	0.00
11.45	2.00	0.63	5.00	0.00	0.00	0.00
11.50	2.00	0.63	5.00	0.00	0.00	0.00
11.55	2.00	0.63	5.00	0.00	0.00	0.00
11.60	2.00	0.63	5.00	0.00	0.00	0.00
11.65	2.00	0.63	5.00	0.00	0.00	0.00
11.70	2.00	0.63	5.00	0.00	0.00	0.00
11.75	2.00	0.63	5.00	0.00	0.00	0.00
11.80	2.00	0.63	5.00	0.00	0.00	0.00
11.85	2.00	0.63	5.00	0.00	0.00	0.00
11.90	2.00	0.63	5.00	0.00	0.00	0.00
11.95	2.00	0.63	5.00	0.00	0.00	0.00
12.00	2.00	0.63	5.00	0.00	0.00	0.00
12.05	2.00	0.63	5.00	0.00	0.00	0.00
12.10	2.00	0.63	5.00	0.00	0.00	0.00
12.15	2.00	0.63	5.00	0.00	0.00	0.00
12.20	2.00	0.63	5.00	0.00	0.00	0.00
12.25	2.00	0.63	5.00	0.00	0.00	0.00
12.30	2.00	0.63	5.00	0.00	0.00	0.00
12.35	2.00	0.63	5.00	0.00	0.00	0.00
12.40	2.00	0.63	5.00	0.00	0.00	0.00
12.45	2.00	0.63	5.00	0.00	0.00	0.00
12.50	2.00	0.63	5.00	0.00	0.00	0.00
12.55	2.00	0.63	5.00	0.00	0.00	0.00
12.60	2.00	0.63	5.00	0.00	0.00	0.00
12.65	2.00	0.63	5.00	0.00	0.00	0.00
12.70	2.00	0.63	5.00	0.00	0.00	0.00
12.75	2.00	0.63	5.00	0.00	0.00	0.00
12.80	2.00	0.63	5.00	0.00	0.00	0.00
12.85	2.00	0.63	5.00	0.00	0.00	0.00
12.90	2.00	0.63	5.00	0.00	0.00	0.00
12.95	2.00	0.63	5.00	0.00	0.00	0.00
13.00	2.00	0.63	5.00	0.00	0.00	0.00
13.05	2.00	0.63	5.00	0.00	0.00	0.00
13.10	2.00	0.63	5.00	0.00	0.00	0.00
13.15	2.00	0.63	5.00	0.00	0.00	0.00
13.20	2.00	0.63	5.00	0.00	0.00	0.00
13.25	2.00	0.63	5.00	0.00	0.00	0.00

13.30	2.00	0.63	5.00	0.00	0.00	0.00
13.35	2.00	0.63	5.00	0.00	0.00	0.00
13.40	2.00	0.63	5.00	0.00	0.00	0.00
13.45	2.00	0.63	5.00	0.00	0.00	0.00
13.50	2.00	0.63	5.00	0.00	0.00	0.00
13.55	2.00	0.63	5.00	0.00	0.00	0.00
13.60	2.00	0.63	5.00	0.00	0.00	0.00
13.65	2.00	0.63	5.00	0.00	0.00	0.00
13.70	2.00	0.63	5.00	0.00	0.00	0.00
13.75	2.00	0.63	5.00	0.00	0.00	0.00
13.80	2.00	0.63	5.00	0.00	0.00	0.00
13.85	2.00	0.63	5.00	0.00	0.00	0.00
13.90	2.00	0.63	5.00	0.00	0.00	0.00
13.95	2.00	0.63	5.00	0.00	0.00	0.00
14.00	2.00	0.63	5.00	0.00	0.00	0.00
14.05	2.00	0.63	5.00	0.00	0.00	0.00
14.10	2.00	0.63	5.00	0.00	0.00	0.00
14.15	2.00	0.63	5.00	0.00	0.00	0.00
14.20	2.00	0.63	5.00	0.00	0.00	0.00
14.25	2.00	0.63	5.00	0.00	0.00	0.00
14.30	2.00	0.63	5.00	0.00	0.00	0.00
14.35	2.00	0.63	5.00	0.00	0.00	0.00
14.40	2.00	0.63	5.00	0.00	0.00	0.00
14.45	2.00	0.63	5.00	0.00	0.00	0.00
14.50	2.00	0.63	5.00	0.00	0.00	0.00
14.55	2.00	0.63	5.00	0.00	0.00	0.00
14.60	2.00	0.63	5.00	0.00	0.00	0.00
14.65	2.00	0.63	5.00	0.00	0.00	0.00
14.70	2.00	0.63	5.00	0.00	0.00	0.00
14.75	2.00	0.63	5.00	0.00	0.00	0.00
14.80	2.00	0.63	5.00	0.00	0.00	0.00
14.85	2.00	0.63	5.00	0.00	0.00	0.00
14.90	2.00	0.63	5.00	0.00	0.00	0.00
14.95	2.00	0.63	5.00	0.00	0.00	0.00
15.00	2.00	0.63	5.00	0.00	0.00	0.00
15.05	2.00	0.63	5.00	0.00	0.00	0.00
15.10	2.00	0.63	5.00	0.00	0.00	0.00
15.15	2.00	0.63	5.00	0.00	0.00	0.00
15.20	2.00	0.63	5.00	0.00	0.00	0.00
15.25	2.00	0.63	5.00	0.00	0.00	0.00
15.30	2.00	0.63	5.00	0.00	0.00	0.00
15.35	2.00	0.63	5.00	0.00	0.00	0.00
15.40	2.00	0.63	5.00	0.00	0.00	0.00
15.45	2.00	0.63	5.00	0.00	0.00	0.00
15.50	2.00	0.63	5.00	0.00	0.00	0.00
15.55	2.00	0.63	5.00	0.00	0.00	0.00
15.60	2.00	0.63	5.00	0.00	0.00	0.00
15.65	2.00	0.63	5.00	0.00	0.00	0.00
15.70	2.00	0.63	5.00	0.00	0.00	0.00
15.75	2.00	0.63	5.00	0.00	0.00	0.00
15.80	2.00	0.63	5.00	0.00	0.00	0.00
15.85	2.00	0.63	5.00	0.00	0.00	0.00
15.90	2.00	0.63	5.00	0.00	0.00	0.00
15.95	2.00	0.63	5.00	0.00	0.00	0.00
16.00	2.00	0.63	5.00	0.00	0.00	0.00
16.05	2.00	0.63	5.00	0.00	0.00	0.00
16.10	2.00	0.63	5.00	0.00	0.00	0.00
16.15	2.00	0.63	5.00	0.00	0.00	0.00
16.20	2.00	0.63	5.00	0.00	0.00	0.00
16.25	2.00	0.63	5.00	0.00	0.00	0.00
16.30	2.00	0.63	5.00	0.00	0.00	0.00
16.35	2.00	0.63	5.00	0.00	0.00	0.00
16.40	2.00	0.63	5.00	0.00	0.00	0.00
16.45	2.00	0.63	5.00	0.00	0.00	0.00
16.50	2.00	0.63	5.00	0.00	0.00	0.00
16.55	2.00	0.63	5.00	0.00	0.00	0.00
16.60	2.00	0.63	5.00	0.00	0.00	0.00

						Liquefy.sum
16.65	2.00	0.63	5.00	0.00	0.00	0.00
16.70	2.00	0.63	5.00	0.00	0.00	0.00
16.75	2.00	0.63	5.00	0.00	0.00	0.00
16.80	2.00	0.63	5.00	0.00	0.00	0.00
16.85	2.00	0.63	5.00	0.00	0.00	0.00
16.90	2.00	0.63	5.00	0.00	0.00	0.00
16.95	2.00	0.62	5.00	0.00	0.00	0.00
17.00	2.00	0.62	5.00	0.00	0.00	0.00
17.05	2.00	0.63	5.00	0.00	0.00	0.00
17.10	2.00	0.63	5.00	0.00	0.00	0.00
17.15	2.00	0.63	5.00	0.00	0.00	0.00
17.20	2.00	0.63	5.00	0.00	0.00	0.00
17.25	2.00	0.63	5.00	0.00	0.00	0.00
17.30	2.00	0.63	5.00	0.00	0.00	0.00
17.35	2.00	0.63	5.00	0.00	0.00	0.00
17.40	2.00	0.63	5.00	0.00	0.00	0.00
17.45	2.00	0.63	5.00	0.00	0.00	0.00
17.50	2.00	0.63	5.00	0.00	0.00	0.00
17.55	2.00	0.63	5.00	0.00	0.00	0.00
17.60	2.00	0.64	5.00	0.00	0.00	0.00
17.65	2.00	0.64	5.00	0.00	0.00	0.00
17.70	2.00	0.64	5.00	0.00	0.00	0.00
17.75	2.00	0.64	5.00	0.00	0.00	0.00
17.80	2.00	0.64	5.00	0.00	0.00	0.00
17.85	2.00	0.64	5.00	0.00	0.00	0.00
17.90	2.00	0.64	5.00	0.00	0.00	0.00
17.95	2.00	0.64	5.00	0.00	0.00	0.00
18.00	2.00	0.64	5.00	0.00	0.00	0.00
18.05	2.00	0.64	5.00	0.00	0.00	0.00
18.10	2.00	0.64	5.00	0.00	0.00	0.00
18.15	2.00	0.65	5.00	0.00	0.00	0.00
18.20	2.00	0.65	5.00	0.00	0.00	0.00
18.25	2.00	0.65	5.00	0.00	0.00	0.00
18.30	2.00	0.65	5.00	0.00	0.00	0.00
18.35	2.00	0.65	5.00	0.00	0.00	0.00
18.40	2.00	0.65	5.00	0.00	0.00	0.00
18.45	2.00	0.65	5.00	0.00	0.00	0.00
18.50	2.00	0.65	5.00	0.00	0.00	0.00
18.55	2.00	0.65	5.00	0.00	0.00	0.00
18.60	2.00	0.65	5.00	0.00	0.00	0.00
18.65	2.00	0.65	5.00	0.00	0.00	0.00
18.70	2.00	0.65	5.00	0.00	0.00	0.00
18.75	2.00	0.66	5.00	0.00	0.00	0.00
18.80	2.00	0.66	5.00	0.00	0.00	0.00
18.85	2.00	0.66	5.00	0.00	0.00	0.00
18.90	2.00	0.66	5.00	0.00	0.00	0.00
18.95	2.00	0.66	5.00	0.00	0.00	0.00
19.00	2.00	0.66	5.00	0.00	0.00	0.00
19.05	2.00	0.66	5.00	0.00	0.00	0.00
19.10	2.00	0.66	5.00	0.00	0.00	0.00
19.15	2.00	0.66	5.00	0.00	0.00	0.00
19.20	2.00	0.66	5.00	0.00	0.00	0.00
19.25	2.00	0.66	5.00	0.00	0.00	0.00
19.30	2.00	0.66	5.00	0.00	0.00	0.00
19.35	2.00	0.67	5.00	0.00	0.00	0.00
19.40	2.00	0.67	5.00	0.00	0.00	0.00
19.45	2.00	0.67	5.00	0.00	0.00	0.00
19.50	2.00	0.67	5.00	0.00	0.00	0.00
19.55	2.00	0.67	5.00	0.00	0.00	0.00
19.60	2.00	0.67	5.00	0.00	0.00	0.00
19.65	2.00	0.67	5.00	0.00	0.00	0.00
19.70	2.00	0.67	5.00	0.00	0.00	0.00
19.75	2.00	0.67	5.00	0.00	0.00	0.00
19.80	2.00	0.67	5.00	0.00	0.00	0.00
19.85	2.00	0.67	5.00	0.00	0.00	0.00
19.90	2.00	0.67	5.00	0.00	0.00	0.00
19.95	2.00	0.68	5.00	0.00	0.00	0.00

20.00	2.00	0.68	5.00	0.00	0.00	0.00
20.05	2.00	0.68	5.00	0.00	0.00	0.00
20.10	2.00	0.68	5.00	0.00	0.00	0.00
20.15	2.00	0.68	5.00	0.00	0.00	0.00
20.20	2.00	0.68	5.00	0.00	0.00	0.00
20.25	2.00	0.68	5.00	0.00	0.00	0.00
20.30	2.00	0.68	5.00	0.00	0.00	0.00
20.35	2.00	0.68	5.00	0.00	0.00	0.00
20.40	2.00	0.68	5.00	0.00	0.00	0.00
20.45	2.00	0.68	5.00	0.00	0.00	0.00
20.50	2.00	0.68	5.00	0.00	0.00	0.00
20.55	2.00	0.68	5.00	0.00	0.00	0.00
20.60	2.00	0.69	5.00	0.00	0.00	0.00
20.65	2.00	0.69	5.00	0.00	0.00	0.00
20.70	2.00	0.69	5.00	0.00	0.00	0.00
20.75	2.00	0.69	5.00	0.00	0.00	0.00
20.80	2.00	0.69	5.00	0.00	0.00	0.00
20.85	2.00	0.69	5.00	0.00	0.00	0.00
20.90	2.00	0.69	5.00	0.00	0.00	0.00
20.95	2.00	0.69	5.00	0.00	0.00	0.00
21.00	2.00	0.69	5.00	0.00	0.00	0.00
21.05	2.00	0.69	5.00	0.00	0.00	0.00
21.10	2.00	0.69	5.00	0.00	0.00	0.00
21.15	2.00	0.69	5.00	0.00	0.00	0.00
21.20	2.00	0.69	5.00	0.00	0.00	0.00
21.25	2.00	0.69	5.00	0.00	0.00	0.00
21.30	2.00	0.70	5.00	0.00	0.00	0.00
21.35	2.00	0.70	5.00	0.00	0.00	0.00
21.40	2.00	0.70	5.00	0.00	0.00	0.00
21.45	2.00	0.70	5.00	0.00	0.00	0.00
21.50	2.00	0.70	5.00	0.00	0.00	0.00
21.55	2.00	0.70	5.00	0.00	0.00	0.00
21.60	2.00	0.70	5.00	0.00	0.00	0.00
21.65	2.00	0.70	5.00	0.00	0.00	0.00
21.70	2.00	0.70	5.00	0.00	0.00	0.00
21.75	2.00	0.70	5.00	0.00	0.00	0.00
21.80	2.00	0.70	5.00	0.00	0.00	0.00
21.85	2.00	0.70	5.00	0.00	0.00	0.00
21.90	2.00	0.70	5.00	0.00	0.00	0.00
21.95	2.00	0.70	5.00	0.00	0.00	0.00
22.00	2.00	0.71	5.00	0.00	0.00	0.00
22.05	2.00	0.71	5.00	0.00	0.00	0.00
22.10	2.00	0.71	5.00	0.00	0.00	0.00
22.15	2.00	0.71	5.00	0.00	0.00	0.00
22.20	2.00	0.71	5.00	0.00	0.00	0.00
22.25	2.00	0.71	5.00	0.00	0.00	0.00
22.30	2.00	0.71	5.00	0.00	0.00	0.00
22.35	2.00	0.71	5.00	0.00	0.00	0.00
22.40	2.00	0.71	5.00	0.00	0.00	0.00
22.45	2.00	0.71	5.00	0.00	0.00	0.00
22.50	2.00	0.71	5.00	0.00	0.00	0.00
22.55	2.00	0.71	5.00	0.00	0.00	0.00
22.60	2.00	0.71	5.00	0.00	0.00	0.00
22.65	2.00	0.71	5.00	0.00	0.00	0.00
22.70	2.00	0.71	5.00	0.00	0.00	0.00
22.75	2.00	0.72	5.00	0.00	0.00	0.00
22.80	2.00	0.72	5.00	0.00	0.00	0.00
22.85	2.00	0.72	5.00	0.00	0.00	0.00
22.90	2.00	0.72	5.00	0.00	0.00	0.00
22.95	2.00	0.72	5.00	0.00	0.00	0.00
23.00	2.00	0.72	5.00	0.00	0.00	0.00
23.05	2.00	0.72	5.00	0.00	0.00	0.00
23.10	2.00	0.72	5.00	0.00	0.00	0.00
23.15	2.00	0.72	5.00	0.00	0.00	0.00
23.20	2.00	0.72	5.00	0.00	0.00	0.00
23.25	2.00	0.72	5.00	0.00	0.00	0.00
23.30	2.00	0.72	5.00	0.00	0.00	0.00

23.35	2.00	0.72	5.00	0.00	0.00	0.00
23.40	2.00	0.72	5.00	0.00	0.00	0.00
23.45	2.00	0.72	5.00	0.00	0.00	0.00
23.50	2.00	0.73	5.00	0.00	0.00	0.00
23.55	2.00	0.73	5.00	0.00	0.00	0.00
23.60	2.00	0.73	5.00	0.00	0.00	0.00
23.65	2.00	0.73	5.00	0.00	0.00	0.00
23.70	2.00	0.73	5.00	0.00	0.00	0.00
23.75	2.00	0.73	5.00	0.00	0.00	0.00
23.80	2.00	0.73	5.00	0.00	0.00	0.00
23.85	2.00	0.73	5.00	0.00	0.00	0.00
23.90	2.00	0.73	5.00	0.00	0.00	0.00
23.95	2.00	0.73	5.00	0.00	0.00	0.00
24.00	2.00	0.73	5.00	0.00	0.00	0.00
24.05	2.00	0.73	5.00	0.00	0.00	0.00
24.10	2.00	0.73	5.00	0.00	0.00	0.00
24.15	2.00	0.73	5.00	0.00	0.00	0.00
24.20	2.00	0.73	5.00	0.00	0.00	0.00
24.25	2.00	0.73	5.00	0.00	0.00	0.00
24.30	2.00	0.74	5.00	0.00	0.00	0.00
24.35	2.00	0.74	5.00	0.00	0.00	0.00
24.40	2.00	0.74	5.00	0.00	0.00	0.00
24.45	2.00	0.74	5.00	0.00	0.00	0.00
24.50	2.00	0.74	5.00	0.00	0.00	0.00
24.55	2.00	0.74	5.00	0.00	0.00	0.00
24.60	2.00	0.74	5.00	0.00	0.00	0.00
24.65	2.00	0.74	5.00	0.00	0.00	0.00
24.70	2.00	0.74	5.00	0.00	0.00	0.00
24.75	2.00	0.74	5.00	0.00	0.00	0.00
24.80	2.00	0.74	5.00	0.00	0.00	0.00
24.85	2.00	0.74	5.00	0.00	0.00	0.00
24.90	2.00	0.74	5.00	0.00	0.00	0.00
24.95	2.00	0.74	5.00	0.00	0.00	0.00
25.00	2.00	0.74	5.00	0.00	0.00	0.00
25.05	2.00	0.74	5.00	0.00	0.00	0.00
25.10	2.00	0.74	5.00	0.00	0.00	0.00
25.15	2.00	0.74	5.00	0.00	0.00	0.00
25.20	2.00	0.75	5.00	0.00	0.00	0.00
25.25	2.00	0.75	5.00	0.00	0.00	0.00
25.30	2.00	0.75	5.00	0.00	0.00	0.00
25.35	2.00	0.75	5.00	0.00	0.00	0.00
25.40	2.00	0.75	5.00	0.00	0.00	0.00
25.45	2.00	0.75	5.00	0.00	0.00	0.00
25.50	2.00	0.75	5.00	0.00	0.00	0.00
25.55	2.00	0.75	5.00	0.00	0.00	0.00
25.60	2.00	0.75	5.00	0.00	0.00	0.00
25.65	2.00	0.75	5.00	0.00	0.00	0.00
25.70	2.00	0.75	5.00	0.00	0.00	0.00
25.75	2.00	0.75	5.00	0.00	0.00	0.00
25.80	2.00	0.75	5.00	0.00	0.00	0.00
25.85	2.00	0.75	5.00	0.00	0.00	0.00
25.90	2.00	0.75	5.00	0.00	0.00	0.00
25.95	2.00	0.75	5.00	0.00	0.00	0.00
26.00	2.00	0.75	5.00	0.00	0.00	0.00
26.05	2.00	0.75	5.00	0.00	0.00	0.00
26.10	2.00	0.76	5.00	0.00	0.00	0.00
26.15	2.00	0.76	5.00	0.00	0.00	0.00
26.20	2.00	0.76	5.00	0.00	0.00	0.00
26.25	2.00	0.76	5.00	0.00	0.00	0.00
26.30	2.00	0.76	5.00	0.00	0.00	0.00
26.35	2.00	0.76	5.00	0.00	0.00	0.00
26.40	2.00	0.76	5.00	0.00	0.00	0.00
26.45	2.00	0.76	5.00	0.00	0.00	0.00
26.50	2.00	0.76	5.00	0.00	0.00	0.00
26.55	2.00	0.76	5.00	0.00	0.00	0.00
26.60	2.00	0.76	5.00	0.00	0.00	0.00
26.65	2.00	0.76	5.00	0.00	0.00	0.00

26.70	2.00	0.76	5.00	0.00	0.00	0.00
26.75	2.00	0.76	5.00	0.00	0.00	0.00
26.80	2.00	0.76	5.00	0.00	0.00	0.00
26.85	2.00	0.76	5.00	0.00	0.00	0.00
26.90	2.00	0.76	5.00	0.00	0.00	0.00
26.95	2.00	0.76	5.00	0.00	0.00	0.00
27.00	2.00	0.76	5.00	0.00	0.00	0.00
27.05	2.00	0.77	5.00	0.00	0.00	0.00
27.10	2.00	0.77	5.00	0.00	0.00	0.00
27.15	2.00	0.77	5.00	0.00	0.00	0.00
27.20	2.00	0.77	5.00	0.00	0.00	0.00
27.25	2.00	0.77	5.00	0.00	0.00	0.00
27.30	2.00	0.77	5.00	0.00	0.00	0.00
27.35	2.00	0.77	5.00	0.00	0.00	0.00
27.40	2.00	0.77	5.00	0.00	0.00	0.00
27.45	2.00	0.77	5.00	0.00	0.00	0.00
27.50	2.00	0.77	5.00	0.00	0.00	0.00
27.55	2.00	0.77	5.00	0.00	0.00	0.00
27.60	2.00	0.77	5.00	0.00	0.00	0.00
27.65	2.00	0.77	5.00	0.00	0.00	0.00
27.70	2.00	0.77	5.00	0.00	0.00	0.00
27.75	2.00	0.77	5.00	0.00	0.00	0.00
27.80	2.00	0.77	5.00	0.00	0.00	0.00
27.85	2.00	0.77	5.00	0.00	0.00	0.00
27.90	2.00	0.77	5.00	0.00	0.00	0.00
27.95	2.00	0.77	5.00	0.00	0.00	0.00
28.00	2.00	0.77	5.00	0.00	0.00	0.00
28.05	2.00	0.78	5.00	0.00	0.00	0.00
28.10	2.00	0.78	5.00	0.00	0.00	0.00
28.15	2.00	0.78	5.00	0.00	0.00	0.00
28.20	2.00	0.78	5.00	0.00	0.00	0.00
28.25	2.00	0.78	5.00	0.00	0.00	0.00
28.30	2.00	0.78	5.00	0.00	0.00	0.00
28.35	2.00	0.78	5.00	0.00	0.00	0.00
28.40	2.00	0.78	5.00	0.00	0.00	0.00
28.45	2.00	0.78	5.00	0.00	0.00	0.00
28.50	2.00	0.78	5.00	0.00	0.00	0.00
28.55	2.00	0.78	5.00	0.00	0.00	0.00
28.60	2.00	0.78	5.00	0.00	0.00	0.00
28.65	2.00	0.78	5.00	0.00	0.00	0.00
28.70	2.00	0.78	5.00	0.00	0.00	0.00
28.75	2.00	0.78	5.00	0.00	0.00	0.00
28.80	2.00	0.78	5.00	0.00	0.00	0.00
28.85	2.00	0.78	5.00	0.00	0.00	0.00
28.90	2.00	0.78	5.00	0.00	0.00	0.00
28.95	2.00	0.78	5.00	0.00	0.00	0.00
29.00	2.00	0.78	5.00	0.00	0.00	0.00
29.05	2.00	0.78	5.00	0.00	0.00	0.00
29.10	2.00	0.78	5.00	0.00	0.00	0.00
29.15	2.00	0.79	5.00	0.00	0.00	0.00
29.20	2.00	0.79	5.00	0.00	0.00	0.00
29.25	2.00	0.79	5.00	0.00	0.00	0.00
29.30	2.00	0.79	5.00	0.00	0.00	0.00
29.35	2.00	0.79	5.00	0.00	0.00	0.00
29.40	2.00	0.79	5.00	0.00	0.00	0.00
29.45	2.00	0.79	5.00	0.00	0.00	0.00
29.50	2.00	0.79	5.00	0.00	0.00	0.00
29.55	2.00	0.79	5.00	0.00	0.00	0.00
29.60	2.00	0.79	5.00	0.00	0.00	0.00
29.65	2.00	0.79	5.00	0.00	0.00	0.00
29.70	2.00	0.79	5.00	0.00	0.00	0.00
29.75	2.00	0.79	5.00	0.00	0.00	0.00
29.80	2.00	0.79	5.00	0.00	0.00	0.00
29.85	2.00	0.79	5.00	0.00	0.00	0.00
29.90	2.00	0.79	5.00	0.00	0.00	0.00
29.95	2.00	0.79	5.00	0.00	0.00	0.00
30.00	2.00	0.79	5.00	0.00	0.00	0.00

30.05	2.00	0.79	5.00	0.00	0.00	0.00
30.10	2.00	0.79	5.00	0.00	0.00	0.00
30.15	2.00	0.79	5.00	0.00	0.00	0.00
30.20	2.00	0.79	5.00	0.00	0.00	0.00
30.25	2.00	0.79	5.00	0.00	0.00	0.00
30.30	2.00	0.79	5.00	0.00	0.00	0.00
30.35	2.00	0.79	5.00	0.00	0.00	0.00
30.40	2.00	0.79	5.00	0.00	0.00	0.00
30.45	2.00	0.79	5.00	0.00	0.00	0.00
30.50	2.00	0.79	5.00	0.00	0.00	0.00
30.55	2.00	0.79	5.00	0.00	0.00	0.00
30.60	2.00	0.79	5.00	0.00	0.00	0.00
30.65	2.00	0.79	5.00	0.00	0.00	0.00
30.70	2.00	0.79	5.00	0.00	0.00	0.00
30.75	2.00	0.80	5.00	0.00	0.00	0.00
30.80	2.00	0.80	5.00	0.00	0.00	0.00
30.85	2.00	0.80	5.00	0.00	0.00	0.00
30.90	2.00	0.80	5.00	0.00	0.00	0.00
30.95	2.00	0.80	5.00	0.00	0.00	0.00
31.00	2.00	0.80	5.00	0.00	0.00	0.00
31.05	2.00	0.80	5.00	0.00	0.00	0.00
31.10	2.00	0.80	5.00	0.00	0.00	0.00
31.15	2.00	0.80	5.00	0.00	0.00	0.00
31.20	2.00	0.80	5.00	0.00	0.00	0.00
31.25	2.00	0.80	5.00	0.00	0.00	0.00
31.30	2.00	0.80	5.00	0.00	0.00	0.00
31.35	2.00	0.80	5.00	0.00	0.00	0.00
31.40	2.00	0.80	5.00	0.00	0.00	0.00
31.45	2.00	0.80	5.00	0.00	0.00	0.00
31.50	2.00	0.80	5.00	0.00	0.00	0.00
31.55	2.00	0.80	5.00	0.00	0.00	0.00
31.60	2.00	0.80	5.00	0.00	0.00	0.00
31.65	2.00	0.80	5.00	0.00	0.00	0.00
31.70	2.00	0.80	5.00	0.00	0.00	0.00
31.75	2.00	0.80	5.00	0.00	0.00	0.00
31.80	2.00	0.80	5.00	0.00	0.00	0.00
31.85	2.00	0.80	5.00	0.00	0.00	0.00
31.90	2.00	0.80	5.00	0.00	0.00	0.00
31.95	2.00	0.80	5.00	0.00	0.00	0.00
32.00	2.00	0.80	5.00	0.00	0.00	0.00
32.05	2.00	0.80	5.00	0.00	0.00	0.00
32.10	2.00	0.80	5.00	0.00	0.00	0.00
32.15	2.00	0.80	5.00	0.00	0.00	0.00
32.20	2.00	0.80	5.00	0.00	0.00	0.00
32.25	2.00	0.80	5.00	0.00	0.00	0.00
32.30	2.00	0.80	5.00	0.00	0.00	0.00
32.35	2.00	0.80	5.00	0.00	0.00	0.00
32.40	2.00	0.80	5.00	0.00	0.00	0.00
32.45	2.00	0.80	5.00	0.00	0.00	0.00
32.50	2.00	0.80	5.00	0.00	0.00	0.00
32.55	2.00	0.80	5.00	0.00	0.00	0.00
32.60	2.00	0.80	5.00	0.00	0.00	0.00
32.65	2.00	0.80	5.00	0.00	0.00	0.00
32.70	2.00	0.80	5.00	0.00	0.00	0.00
32.75	2.00	0.80	5.00	0.00	0.00	0.00
32.80	2.00	0.80	5.00	0.00	0.00	0.00
32.85	2.00	0.80	5.00	0.00	0.00	0.00
32.90	2.00	0.80	5.00	0.00	0.00	0.00
32.95	2.00	0.80	5.00	0.00	0.00	0.00
33.00	2.00	0.80	5.00	0.00	0.00	0.00
33.05	2.00	0.80	5.00	0.00	0.00	0.00
33.10	2.00	0.80	5.00	0.00	0.00	0.00
33.15	2.00	0.80	5.00	0.00	0.00	0.00
33.20	2.00	0.80	5.00	0.00	0.00	0.00
33.25	2.00	0.80	5.00	0.00	0.00	0.00
33.30	2.00	0.80	5.00	0.00	0.00	0.00
33.35	2.00	0.80	5.00	0.00	0.00	0.00

33.40	2.00	0.80	5.00	0.00	0.00	0.00
33.45	2.00	0.80	5.00	0.00	0.00	0.00
33.50	2.00	0.80	5.00	0.00	0.00	0.00
33.55	2.00	0.80	5.00	0.00	0.00	0.00
33.60	2.00	0.80	5.00	0.00	0.00	0.00
33.65	2.00	0.80	5.00	0.00	0.00	0.00
33.70	2.00	0.80	5.00	0.00	0.00	0.00
33.75	2.00	0.80	5.00	0.00	0.00	0.00
33.80	2.00	0.80	5.00	0.00	0.00	0.00
33.85	2.00	0.80	5.00	0.00	0.00	0.00
33.90	2.00	0.80	5.00	0.00	0.00	0.00
33.95	2.00	0.80	5.00	0.00	0.00	0.00
34.00	2.00	0.80	5.00	0.00	0.00	0.00
34.05	2.00	0.80	5.00	0.00	0.00	0.00
34.10	2.00	0.80	5.00	0.00	0.00	0.00
34.15	2.00	0.80	5.00	0.00	0.00	0.00
34.20	2.00	0.80	5.00	0.00	0.00	0.00
34.25	2.00	0.80	5.00	0.00	0.00	0.00
34.30	2.00	0.80	5.00	0.00	0.00	0.00
34.35	2.00	0.80	5.00	0.00	0.00	0.00
34.40	2.00	0.80	5.00	0.00	0.00	0.00
34.45	2.00	0.80	5.00	0.00	0.00	0.00
34.50	2.00	0.80	5.00	0.00	0.00	0.00
34.55	2.00	0.80	5.00	0.00	0.00	0.00
34.60	2.00	0.80	5.00	0.00	0.00	0.00
34.65	2.00	0.80	5.00	0.00	0.00	0.00
34.70	2.00	0.80	5.00	0.00	0.00	0.00
34.75	2.00	0.80	5.00	0.00	0.00	0.00
34.80	2.00	0.80	5.00	0.00	0.00	0.00
34.85	2.00	0.80	5.00	0.00	0.00	0.00
34.90	2.00	0.80	5.00	0.00	0.00	0.00
34.95	2.00	0.80	5.00	0.00	0.00	0.00
35.00	2.00	0.80	5.00	0.00	0.00	0.00
35.05	2.00	0.80	5.00	0.00	0.00	0.00
35.10	2.00	0.80	5.00	0.00	0.00	0.00
35.15	2.00	0.80	5.00	0.00	0.00	0.00
35.20	2.00	0.80	5.00	0.00	0.00	0.00
35.25	2.00	0.80	5.00	0.00	0.00	0.00
35.30	2.00	0.80	5.00	0.00	0.00	0.00
35.35	2.00	0.80	5.00	0.00	0.00	0.00
35.40	2.00	0.80	5.00	0.00	0.00	0.00
35.45	2.00	0.80	5.00	0.00	0.00	0.00
35.50	2.00	0.80	5.00	0.00	0.00	0.00
35.55	2.00	0.80	5.00	0.00	0.00	0.00
35.60	2.00	0.80	5.00	0.00	0.00	0.00
35.65	2.00	0.80	5.00	0.00	0.00	0.00
35.70	2.00	0.80	5.00	0.00	0.00	0.00
35.75	2.00	0.80	5.00	0.00	0.00	0.00
35.80	2.00	0.80	5.00	0.00	0.00	0.00
35.85	2.00	0.80	5.00	0.00	0.00	0.00
35.90	2.00	0.80	5.00	0.00	0.00	0.00
35.95	2.00	0.80	5.00	0.00	0.00	0.00
36.00	2.00	0.80	5.00	0.00	0.00	0.00
36.05	2.00	0.80	5.00	0.00	0.00	0.00
36.10	2.00	0.80	5.00	0.00	0.00	0.00
36.15	2.00	0.80	5.00	0.00	0.00	0.00
36.20	2.00	0.80	5.00	0.00	0.00	0.00
36.25	2.00	0.80	5.00	0.00	0.00	0.00
36.30	2.00	0.80	5.00	0.00	0.00	0.00
36.35	2.00	0.80	5.00	0.00	0.00	0.00
36.40	2.00	0.80	5.00	0.00	0.00	0.00
36.45	2.00	0.80	5.00	0.00	0.00	0.00
36.50	2.00	0.80	5.00	0.00	0.00	0.00
36.55	2.00	0.80	5.00	0.00	0.00	0.00
36.60	2.00	0.80	5.00	0.00	0.00	0.00
36.65	2.00	0.80	5.00	0.00	0.00	0.00
36.70	2.00	0.80	5.00	0.00	0.00	0.00

36.75	2.00	0.80	5.00	0.00	0.00	0.00
36.80	2.00	0.80	5.00	0.00	0.00	0.00
36.85	2.00	0.80	5.00	0.00	0.00	0.00
36.90	2.00	0.80	5.00	0.00	0.00	0.00
36.95	2.00	0.80	5.00	0.00	0.00	0.00
37.00	2.00	0.80	5.00	0.00	0.00	0.00
37.05	2.00	0.80	5.00	0.00	0.00	0.00
37.10	2.00	0.80	5.00	0.00	0.00	0.00
37.15	2.00	0.80	5.00	0.00	0.00	0.00
37.20	2.00	0.80	5.00	0.00	0.00	0.00
37.25	2.00	0.80	5.00	0.00	0.00	0.00
37.30	2.00	0.80	5.00	0.00	0.00	0.00
37.35	2.00	0.80	5.00	0.00	0.00	0.00
37.40	2.00	0.80	5.00	0.00	0.00	0.00
37.45	2.00	0.80	5.00	0.00	0.00	0.00
37.50	2.00	0.80	5.00	0.00	0.00	0.00
37.55	2.00	0.80	5.00	0.00	0.00	0.00
37.60	2.00	0.80	5.00	0.00	0.00	0.00
37.65	2.00	0.80	5.00	0.00	0.00	0.00
37.70	2.00	0.80	5.00	0.00	0.00	0.00
37.75	2.00	0.80	5.00	0.00	0.00	0.00
37.80	2.00	0.80	5.00	0.00	0.00	0.00
37.85	2.00	0.80	5.00	0.00	0.00	0.00
37.90	2.00	0.80	5.00	0.00	0.00	0.00
37.95	2.00	0.80	5.00	0.00	0.00	0.00
38.00	2.00	0.80	5.00	0.00	0.00	0.00
38.05	2.00	0.80	5.00	0.00	0.00	0.00
38.10	2.00	0.80	5.00	0.00	0.00	0.00
38.15	2.00	0.80	5.00	0.00	0.00	0.00
38.20	2.00	0.80	5.00	0.00	0.00	0.00
38.25	2.00	0.80	5.00	0.00	0.00	0.00
38.30	2.00	0.80	5.00	0.00	0.00	0.00
38.35	2.00	0.80	5.00	0.00	0.00	0.00
38.40	2.00	0.80	5.00	0.00	0.00	0.00
38.45	2.00	0.80	5.00	0.00	0.00	0.00
38.50	2.00	0.80	5.00	0.00	0.00	0.00
38.55	2.00	0.80	5.00	0.00	0.00	0.00
38.60	2.00	0.80	5.00	0.00	0.00	0.00
38.65	2.00	0.80	5.00	0.00	0.00	0.00
38.70	2.00	0.80	5.00	0.00	0.00	0.00
38.75	2.00	0.80	5.00	0.00	0.00	0.00
38.80	2.00	0.80	5.00	0.00	0.00	0.00
38.85	2.00	0.80	5.00	0.00	0.00	0.00
38.90	2.00	0.80	5.00	0.00	0.00	0.00
38.95	2.00	0.80	5.00	0.00	0.00	0.00
39.00	2.00	0.80	5.00	0.00	0.00	0.00
39.05	2.00	0.80	5.00	0.00	0.00	0.00
39.10	2.00	0.80	5.00	0.00	0.00	0.00
39.15	2.00	0.80	5.00	0.00	0.00	0.00
39.20	2.00	0.80	5.00	0.00	0.00	0.00
39.25	2.00	0.80	5.00	0.00	0.00	0.00
39.30	2.00	0.80	5.00	0.00	0.00	0.00
39.35	2.00	0.80	5.00	0.00	0.00	0.00
39.40	2.00	0.80	5.00	0.00	0.00	0.00
39.45	2.00	0.80	5.00	0.00	0.00	0.00
39.50	2.00	0.80	5.00	0.00	0.00	0.00
39.55	2.00	0.80	5.00	0.00	0.00	0.00
39.60	2.00	0.80	5.00	0.00	0.00	0.00
39.65	2.00	0.80	5.00	0.00	0.00	0.00
39.70	2.00	0.80	5.00	0.00	0.00	0.00
39.75	2.00	0.80	5.00	0.00	0.00	0.00
39.80	2.00	0.80	5.00	0.00	0.00	0.00
39.85	2.00	0.80	5.00	0.00	0.00	0.00
39.90	2.00	0.80	5.00	0.00	0.00	0.00
39.95	2.00	0.80	5.00	0.00	0.00	0.00
40.00	2.00	0.80	5.00	0.00	0.00	0.00
40.05	2.00	0.80	5.00	0.00	0.00	0.00

40.10	2.00	0.80	5.00	0.00	0.00	0.00
40.15	2.00	0.80	5.00	0.00	0.00	0.00
40.20	2.00	0.80	5.00	0.00	0.00	0.00
40.25	2.00	0.80	5.00	0.00	0.00	0.00
40.30	2.00	0.80	5.00	0.00	0.00	0.00
40.35	2.00	0.80	5.00	0.00	0.00	0.00
40.40	2.00	0.80	5.00	0.00	0.00	0.00
40.45	2.00	0.80	5.00	0.00	0.00	0.00
40.50	2.00	0.80	5.00	0.00	0.00	0.00
40.55	2.00	0.80	5.00	0.00	0.00	0.00
40.60	2.00	0.80	5.00	0.00	0.00	0.00
40.65	2.00	0.80	5.00	0.00	0.00	0.00
40.70	2.00	0.80	5.00	0.00	0.00	0.00
40.75	2.00	0.80	5.00	0.00	0.00	0.00
40.80	2.00	0.80	5.00	0.00	0.00	0.00
40.85	2.00	0.80	5.00	0.00	0.00	0.00
40.90	2.00	0.80	5.00	0.00	0.00	0.00
40.95	2.00	0.80	5.00	0.00	0.00	0.00
41.00	2.00	0.80	5.00	0.00	0.00	0.00
41.05	2.00	0.80	5.00	0.00	0.00	0.00
41.10	2.00	0.80	5.00	0.00	0.00	0.00
41.15	2.00	0.80	5.00	0.00	0.00	0.00
41.20	2.00	0.80	5.00	0.00	0.00	0.00
41.25	2.00	0.80	5.00	0.00	0.00	0.00
41.30	2.00	0.80	5.00	0.00	0.00	0.00
41.35	2.00	0.80	5.00	0.00	0.00	0.00
41.40	2.00	0.80	5.00	0.00	0.00	0.00
41.45	2.00	0.80	5.00	0.00	0.00	0.00
41.50	2.00	0.80	5.00	0.00	0.00	0.00
41.55	2.00	0.80	5.00	0.00	0.00	0.00
41.60	2.00	0.80	5.00	0.00	0.00	0.00
41.65	2.00	0.80	5.00	0.00	0.00	0.00
41.70	2.00	0.80	5.00	0.00	0.00	0.00
41.75	2.00	0.80	5.00	0.00	0.00	0.00
41.80	2.00	0.80	5.00	0.00	0.00	0.00
41.85	2.00	0.80	5.00	0.00	0.00	0.00
41.90	2.00	0.80	5.00	0.00	0.00	0.00
41.95	2.00	0.80	5.00	0.00	0.00	0.00
42.00	2.00	0.80	5.00	0.00	0.00	0.00
42.05	2.00	0.80	5.00	0.00	0.00	0.00
42.10	2.00	0.80	5.00	0.00	0.00	0.00
42.15	2.00	0.80	5.00	0.00	0.00	0.00
42.20	2.00	0.80	5.00	0.00	0.00	0.00
42.25	2.00	0.80	5.00	0.00	0.00	0.00
42.30	2.00	0.80	5.00	0.00	0.00	0.00
42.35	2.00	0.80	5.00	0.00	0.00	0.00
42.40	2.00	0.80	5.00	0.00	0.00	0.00
42.45	2.00	0.80	5.00	0.00	0.00	0.00
42.50	2.00	0.80	5.00	0.00	0.00	0.00
42.55	2.00	0.80	5.00	0.00	0.00	0.00
42.60	2.00	0.80	5.00	0.00	0.00	0.00
42.65	2.00	0.80	5.00	0.00	0.00	0.00
42.70	2.00	0.80	5.00	0.00	0.00	0.00
42.75	2.00	0.80	5.00	0.00	0.00	0.00
42.80	2.00	0.80	5.00	0.00	0.00	0.00
42.85	2.00	0.80	5.00	0.00	0.00	0.00
42.90	2.00	0.80	5.00	0.00	0.00	0.00
42.95	2.00	0.80	5.00	0.00	0.00	0.00
43.00	2.00	0.80	5.00	0.00	0.00	0.00
43.05	2.00	0.80	5.00	0.00	0.00	0.00
43.10	2.00	0.80	5.00	0.00	0.00	0.00
43.15	2.00	0.80	5.00	0.00	0.00	0.00
43.20	2.00	0.80	5.00	0.00	0.00	0.00
43.25	2.00	0.80	5.00	0.00	0.00	0.00
43.30	2.00	0.80	5.00	0.00	0.00	0.00
43.35	2.00	0.80	5.00	0.00	0.00	0.00
43.40	2.00	0.80	5.00	0.00	0.00	0.00

43.45	2.00	0.80	5.00	0.00	0.00	0.00
43.50	2.00	0.80	5.00	0.00	0.00	0.00
43.55	2.00	0.80	5.00	0.00	0.00	0.00
43.60	2.00	0.80	5.00	0.00	0.00	0.00
43.65	2.00	0.80	5.00	0.00	0.00	0.00
43.70	2.00	0.80	5.00	0.00	0.00	0.00
43.75	2.00	0.80	5.00	0.00	0.00	0.00
43.80	2.00	0.80	5.00	0.00	0.00	0.00
43.85	2.00	0.79	5.00	0.00	0.00	0.00
43.90	2.00	0.79	5.00	0.00	0.00	0.00
43.95	2.00	0.79	5.00	0.00	0.00	0.00
44.00	2.00	0.79	5.00	0.00	0.00	0.00
44.05	2.00	0.79	5.00	0.00	0.00	0.00
44.10	2.00	0.79	5.00	0.00	0.00	0.00
44.15	2.00	0.79	5.00	0.00	0.00	0.00
44.20	2.00	0.79	5.00	0.00	0.00	0.00
44.25	2.00	0.79	5.00	0.00	0.00	0.00
44.30	2.00	0.79	5.00	0.00	0.00	0.00
44.35	2.00	0.79	5.00	0.00	0.00	0.00
44.40	2.00	0.79	5.00	0.00	0.00	0.00
44.45	2.00	0.79	5.00	0.00	0.00	0.00
44.50	2.00	0.79	5.00	0.00	0.00	0.00
44.55	2.00	0.79	5.00	0.00	0.00	0.00
44.60	2.00	0.79	5.00	0.00	0.00	0.00
44.65	2.00	0.79	5.00	0.00	0.00	0.00
44.70	2.00	0.79	5.00	0.00	0.00	0.00
44.75	2.00	0.79	5.00	0.00	0.00	0.00
44.80	2.00	0.79	5.00	0.00	0.00	0.00
44.85	2.00	0.79	5.00	0.00	0.00	0.00
44.90	2.00	0.79	5.00	0.00	0.00	0.00
44.95	2.00	0.79	5.00	0.00	0.00	0.00
45.00	2.00	0.79	5.00	0.00	0.00	0.00
45.05	2.00	0.79	5.00	0.00	0.00	0.00
45.10	2.00	0.79	5.00	0.00	0.00	0.00
45.15	2.00	0.79	5.00	0.00	0.00	0.00
45.20	2.00	0.79	5.00	0.00	0.00	0.00
45.25	2.00	0.79	5.00	0.00	0.00	0.00
45.30	2.00	0.79	5.00	0.00	0.00	0.00
45.35	2.00	0.79	5.00	0.00	0.00	0.00
45.40	2.00	0.79	5.00	0.00	0.00	0.00
45.45	2.00	0.79	5.00	0.00	0.00	0.00
45.50	2.00	0.79	5.00	0.00	0.00	0.00
45.55	2.00	0.79	5.00	0.00	0.00	0.00
45.60	2.00	0.79	5.00	0.00	0.00	0.00
45.65	2.00	0.79	5.00	0.00	0.00	0.00
45.70	2.00	0.79	5.00	0.00	0.00	0.00
45.75	2.00	0.79	5.00	0.00	0.00	0.00
45.80	2.00	0.79	5.00	0.00	0.00	0.00
45.85	2.00	0.79	5.00	0.00	0.00	0.00
45.90	2.00	0.79	5.00	0.00	0.00	0.00
45.95	2.00	0.79	5.00	0.00	0.00	0.00
46.00	2.00	0.79	5.00	0.00	0.00	0.00
46.05	2.00	0.79	5.00	0.00	0.00	0.00
46.10	2.00	0.79	5.00	0.00	0.00	0.00
46.15	2.00	0.79	5.00	0.00	0.00	0.00
46.20	2.00	0.79	5.00	0.00	0.00	0.00
46.25	2.00	0.79	5.00	0.00	0.00	0.00
46.30	2.00	0.79	5.00	0.00	0.00	0.00
46.35	2.00	0.79	5.00	0.00	0.00	0.00
46.40	2.00	0.79	5.00	0.00	0.00	0.00
46.45	2.00	0.79	5.00	0.00	0.00	0.00
46.50	2.00	0.79	5.00	0.00	0.00	0.00
46.55	2.00	0.79	5.00	0.00	0.00	0.00
46.60	2.00	0.79	5.00	0.00	0.00	0.00
46.65	2.00	0.79	5.00	0.00	0.00	0.00
46.70	2.00	0.79	5.00	0.00	0.00	0.00
46.75	2.00	0.79	5.00	0.00	0.00	0.00

						Liquefy.sum
46.80	2.00	0.79	5.00	0.00	0.00	0.00
46.85	2.00	0.79	5.00	0.00	0.00	0.00
46.90	2.00	0.79	5.00	0.00	0.00	0.00
46.95	2.00	0.79	5.00	0.00	0.00	0.00
47.00	2.00	0.79	5.00	0.00	0.00	0.00
47.05	2.00	0.79	5.00	0.00	0.00	0.00
47.10	2.00	0.79	5.00	0.00	0.00	0.00
47.15	2.00	0.79	5.00	0.00	0.00	0.00
47.20	2.00	0.79	5.00	0.00	0.00	0.00
47.25	2.00	0.79	5.00	0.00	0.00	0.00
47.30	2.00	0.78	5.00	0.00	0.00	0.00
47.35	2.00	0.78	5.00	0.00	0.00	0.00
47.40	2.00	0.78	5.00	0.00	0.00	0.00
47.45	2.00	0.78	5.00	0.00	0.00	0.00
47.50	2.00	0.78	5.00	0.00	0.00	0.00
47.55	2.00	0.78	5.00	0.00	0.00	0.00
47.60	2.00	0.78	5.00	0.00	0.00	0.00
47.65	2.00	0.78	5.00	0.00	0.00	0.00
47.70	2.00	0.78	5.00	0.00	0.00	0.00
47.75	2.00	0.78	5.00	0.00	0.00	0.00
47.80	2.00	0.78	5.00	0.00	0.00	0.00
47.85	2.00	0.78	5.00	0.00	0.00	0.00
47.90	2.00	0.78	5.00	0.00	0.00	0.00
47.95	2.00	0.78	5.00	0.00	0.00	0.00
48.00	2.00	0.78	5.00	0.00	0.00	0.00
48.05	2.00	0.78	5.00	0.00	0.00	0.00
48.10	2.00	0.78	5.00	0.00	0.00	0.00
48.15	2.00	0.78	5.00	0.00	0.00	0.00
48.20	2.00	0.78	5.00	0.00	0.00	0.00
48.25	2.00	0.78	5.00	0.00	0.00	0.00
48.30	2.00	0.78	5.00	0.00	0.00	0.00
48.35	2.00	0.78	5.00	0.00	0.00	0.00
48.40	2.00	0.78	5.00	0.00	0.00	0.00
48.45	2.00	0.78	5.00	0.00	0.00	0.00
48.50	2.00	0.78	5.00	0.00	0.00	0.00
48.55	2.00	0.78	5.00	0.00	0.00	0.00
48.60	2.00	0.78	5.00	0.00	0.00	0.00
48.65	2.00	0.78	5.00	0.00	0.00	0.00
48.70	2.00	0.78	5.00	0.00	0.00	0.00
48.75	2.00	0.78	5.00	0.00	0.00	0.00
48.80	2.00	0.78	5.00	0.00	0.00	0.00
48.85	2.00	0.78	5.00	0.00	0.00	0.00
48.90	2.00	0.78	5.00	0.00	0.00	0.00
48.95	2.00	0.78	5.00	0.00	0.00	0.00
49.00	2.00	0.78	5.00	0.00	0.00	0.00
49.05	2.00	0.78	5.00	0.00	0.00	0.00
49.10	2.00	0.78	5.00	0.00	0.00	0.00
49.15	2.00	0.78	5.00	0.00	0.00	0.00
49.20	2.00	0.78	5.00	0.00	0.00	0.00
49.25	2.00	0.78	5.00	0.00	0.00	0.00
49.30	2.00	0.78	5.00	0.00	0.00	0.00
49.35	2.00	0.78	5.00	0.00	0.00	0.00
49.40	2.00	0.78	5.00	0.00	0.00	0.00
49.45	2.00	0.78	5.00	0.00	0.00	0.00
49.50	2.00	0.78	5.00	0.00	0.00	0.00
49.55	2.00	0.78	5.00	0.00	0.00	0.00
49.60	2.00	0.78	5.00	0.00	0.00	0.00
49.65	2.00	0.78	5.00	0.00	0.00	0.00
49.70	2.00	0.78	5.00	0.00	0.00	0.00
49.75	2.00	0.78	5.00	0.00	0.00	0.00
49.80	2.00	0.78	5.00	0.00	0.00	0.00
49.85	2.00	0.78	5.00	0.00	0.00	0.00
49.90	2.00	0.78	5.00	0.00	0.00	0.00
49.95	2.00	0.78	5.00	0.00	0.00	0.00
50.00	2.00	0.77	5.00	0.00	0.00	0.00

* 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.

---

1 atm (atmosphere) = 1 tsf (ton/ft2)

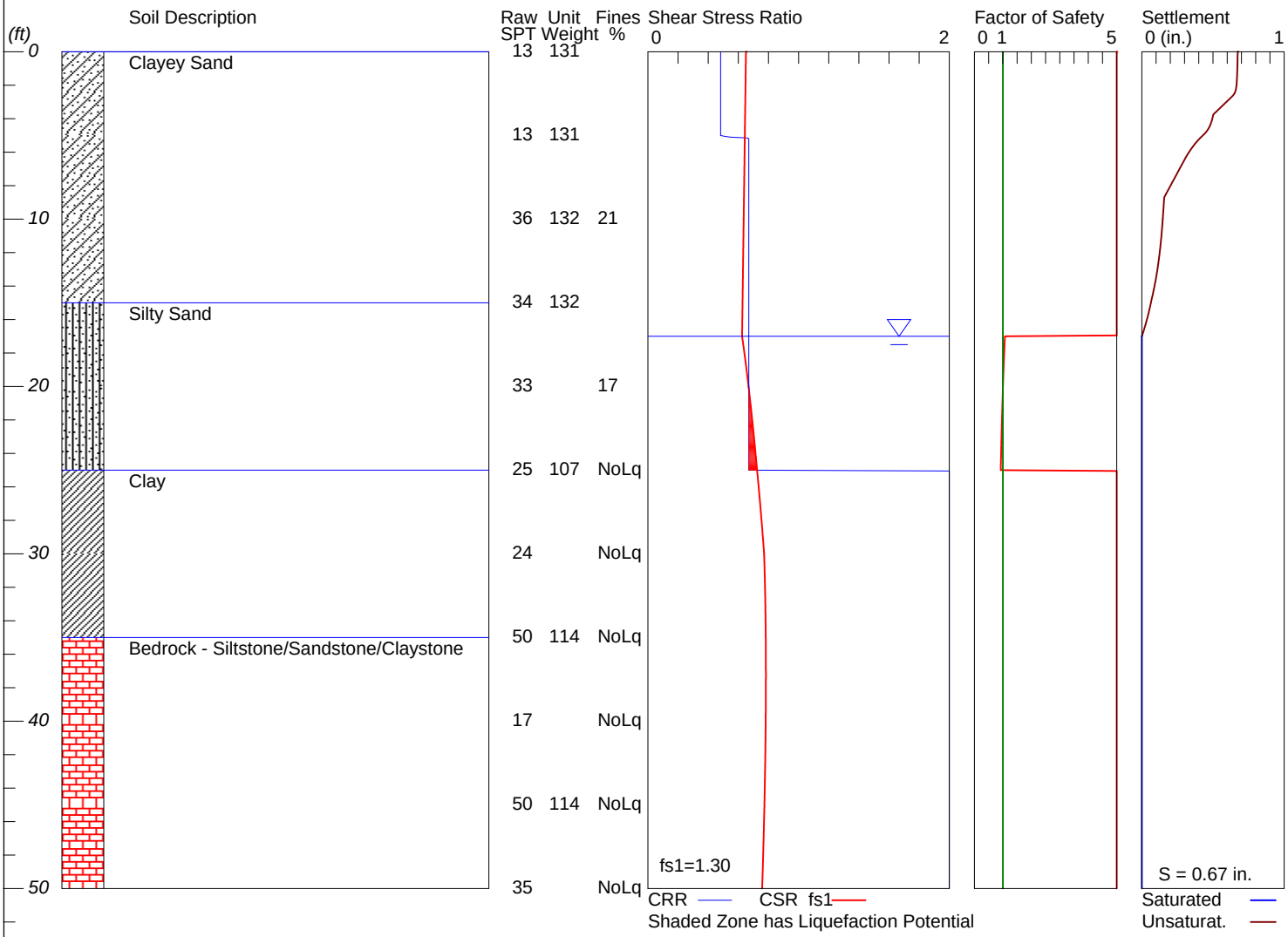
CRRm	Cyclic resistance ratio from soils
CSRsf	Cyclic stress ratio induced by a given earthquake (with user request factor of safety)
F.S.	Factor of Safety against liquefaction, F.S.=CRRm/CSRsf
S_sat	Settlement from saturated sands
S_dry	Settlement from Unsaturated Sands
S_all	Total Settlement from Saturated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

LIQUEFACTION ANALYSIS

Mt. SAC Athletics Complex East

Hole No.=BH-26 Water Depth=17 ft Surface Elev.=741

Magnitude=6.69
Acceleration=0.77g



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LIQUEFACTION ANALYSIS SUMMARY
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Input File Name: L:\2014\31\14-31-124 Mt. SAC - Proposed Athletic Complex\Analyses\14-31-124-01-LQ-BH14.liq
Title: Mt. SAC Athletics Complex East
Subtitle: 14-31-124-01

Surface Elev.=741
Hole No.=BH-26
Depth of Hole= 50.00 ft
Water Table during Earthquake= 17.00 ft
Water Table during In-Situ Testing= 17.00 ft
Max. Acceleration= 0.77 g
Earthquake Magnitude= 6.69

Input Data:
Surface Elev.=741
Hole No.=BH-26
Depth of Hole=50.00 ft
Water Table during Earthquake= 17.00 ft
Water Table during In-Situ Testing= 17.00 ft
Max. Acceleration=0.77 g
Earthquake Magnitude=6.69
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: Stark/Olson et al.*
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1.15
8. Sampling Method, Cs= 1.2
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	13.00	131.00	0.00
5.00	13.00	131.00	0.00
10.00	36.00	132.00	21.00
15.00	34.00	132.00	21.00
20.00	33.00	132.00	17.00
25.00	25.00	107.00	NoLiq
30.00	24.00	107.00	NoLiq
35.00	50.00	114.00	NoLiq
40.00	17.00	114.00	NoLiq
45.00	50.00	114.00	NoLiq
50.00	35.00	114.00	NoLiq

Output Results:
Settlement of Saturated Sands=0.00 in.
Settlement of Unsaturated Sands=0.67 in.
Total Settlement of Saturated and Unsaturated Sands=0.67 in.
Differential Settlement=0.337 to 0.444 in.

Depth	CRRm	CSRfs	F.S.	S_sat.	S_dry	S_all

ft				in.	in.	Liquefy.sum in.
0.00	0.48	0.65	5.00	0.00	0.67	0.67
0.05	0.48	0.65	5.00	0.00	0.67	0.67
0.10	0.48	0.65	5.00	0.00	0.67	0.67
0.15	0.48	0.65	5.00	0.00	0.67	0.67
0.20	0.48	0.65	5.00	0.00	0.67	0.67
0.25	0.48	0.65	5.00	0.00	0.67	0.67
0.30	0.48	0.65	5.00	0.00	0.67	0.67
0.35	0.48	0.65	5.00	0.00	0.67	0.67
0.40	0.48	0.65	5.00	0.00	0.67	0.67
0.45	0.48	0.65	5.00	0.00	0.67	0.67
0.50	0.48	0.65	5.00	0.00	0.67	0.67
0.55	0.48	0.65	5.00	0.00	0.67	0.67
0.60	0.48	0.65	5.00	0.00	0.67	0.67
0.65	0.48	0.65	5.00	0.00	0.67	0.67
0.70	0.48	0.65	5.00	0.00	0.67	0.67
0.75	0.48	0.65	5.00	0.00	0.67	0.67
0.80	0.48	0.65	5.00	0.00	0.67	0.67
0.85	0.48	0.65	5.00	0.00	0.67	0.67
0.90	0.48	0.65	5.00	0.00	0.67	0.67
0.95	0.48	0.65	5.00	0.00	0.67	0.67
1.00	0.48	0.65	5.00	0.00	0.67	0.67
1.05	0.48	0.65	5.00	0.00	0.67	0.67
1.10	0.48	0.65	5.00	0.00	0.67	0.67
1.15	0.48	0.65	5.00	0.00	0.67	0.67
1.20	0.48	0.65	5.00	0.00	0.67	0.67
1.25	0.48	0.65	5.00	0.00	0.67	0.67
1.30	0.48	0.65	5.00	0.00	0.67	0.67
1.35	0.48	0.65	5.00	0.00	0.67	0.67
1.40	0.48	0.65	5.00	0.00	0.67	0.67
1.45	0.48	0.65	5.00	0.00	0.67	0.67
1.50	0.48	0.65	5.00	0.00	0.67	0.67
1.55	0.48	0.65	5.00	0.00	0.67	0.67
1.60	0.48	0.65	5.00	0.00	0.67	0.67
1.65	0.48	0.65	5.00	0.00	0.67	0.67
1.70	0.48	0.65	5.00	0.00	0.67	0.67
1.75	0.48	0.65	5.00	0.00	0.67	0.67
1.80	0.48	0.65	5.00	0.00	0.67	0.67
1.85	0.48	0.65	5.00	0.00	0.67	0.67
1.90	0.48	0.65	5.00	0.00	0.67	0.67
1.95	0.48	0.65	5.00	0.00	0.67	0.67
2.00	0.48	0.65	5.00	0.00	0.67	0.67
2.05	0.48	0.65	5.00	0.00	0.66	0.66
2.10	0.48	0.65	5.00	0.00	0.66	0.66
2.15	0.48	0.65	5.00	0.00	0.66	0.66
2.20	0.48	0.65	5.00	0.00	0.66	0.66
2.25	0.48	0.65	5.00	0.00	0.66	0.66
2.30	0.48	0.65	5.00	0.00	0.66	0.66
2.35	0.48	0.65	5.00	0.00	0.66	0.66
2.40	0.48	0.65	5.00	0.00	0.66	0.66
2.45	0.48	0.65	5.00	0.00	0.65	0.65
2.50	0.48	0.65	5.00	0.00	0.65	0.65
2.55	0.48	0.65	5.00	0.00	0.65	0.65
2.60	0.48	0.65	5.00	0.00	0.64	0.64
2.65	0.48	0.65	5.00	0.00	0.64	0.64
2.70	0.48	0.65	5.00	0.00	0.63	0.63
2.75	0.48	0.65	5.00	0.00	0.62	0.62
2.80	0.48	0.65	5.00	0.00	0.62	0.62
2.85	0.48	0.65	5.00	0.00	0.61	0.61
2.90	0.48	0.65	5.00	0.00	0.61	0.61
2.95	0.48	0.65	5.00	0.00	0.60	0.60
3.00	0.48	0.65	5.00	0.00	0.59	0.59
3.05	0.48	0.65	5.00	0.00	0.59	0.59
3.10	0.48	0.65	5.00	0.00	0.58	0.58
3.15	0.48	0.65	5.00	0.00	0.58	0.58
3.20	0.48	0.65	5.00	0.00	0.57	0.57

						Liquefy.sum
3.25	0.48	0.65	5.00	0.00	0.56	0.56
3.30	0.48	0.65	5.00	0.00	0.56	0.56
3.35	0.48	0.65	5.00	0.00	0.55	0.55
3.40	0.48	0.65	5.00	0.00	0.54	0.54
3.45	0.48	0.65	5.00	0.00	0.54	0.54
3.50	0.48	0.65	5.00	0.00	0.53	0.53
3.55	0.48	0.65	5.00	0.00	0.53	0.53
3.60	0.48	0.65	5.00	0.00	0.52	0.52
3.65	0.48	0.65	5.00	0.00	0.51	0.51
3.70	0.48	0.65	5.00	0.00	0.51	0.51
3.75	0.48	0.64	5.00	0.00	0.50	0.50
3.80	0.48	0.64	5.00	0.00	0.50	0.50
3.85	0.48	0.64	5.00	0.00	0.50	0.50
3.90	0.48	0.64	5.00	0.00	0.50	0.50
3.95	0.48	0.64	5.00	0.00	0.50	0.50
4.00	0.48	0.64	5.00	0.00	0.50	0.50
4.05	0.48	0.64	5.00	0.00	0.49	0.49
4.10	0.48	0.64	5.00	0.00	0.49	0.49
4.15	0.48	0.64	5.00	0.00	0.49	0.49
4.20	0.48	0.64	5.00	0.00	0.49	0.49
4.25	0.48	0.64	5.00	0.00	0.49	0.49
4.30	0.48	0.64	5.00	0.00	0.48	0.48
4.35	0.48	0.64	5.00	0.00	0.48	0.48
4.40	0.48	0.64	5.00	0.00	0.48	0.48
4.45	0.48	0.64	5.00	0.00	0.48	0.48
4.50	0.48	0.64	5.00	0.00	0.47	0.47
4.55	0.48	0.64	5.00	0.00	0.47	0.47
4.60	0.48	0.64	5.00	0.00	0.47	0.47
4.65	0.48	0.64	5.00	0.00	0.46	0.46
4.70	0.48	0.64	5.00	0.00	0.46	0.46
4.75	0.48	0.64	5.00	0.00	0.46	0.46
4.80	0.48	0.64	5.00	0.00	0.45	0.45
4.85	0.48	0.64	5.00	0.00	0.45	0.45
4.90	0.48	0.64	5.00	0.00	0.44	0.44
4.95	0.48	0.64	5.00	0.00	0.43	0.43
5.00	0.48	0.64	5.00	0.00	0.43	0.43
5.05	0.51	0.64	5.00	0.00	0.42	0.42
5.10	0.55	0.64	5.00	0.00	0.42	0.42
5.15	0.66	0.64	5.00	0.00	0.41	0.41
5.20	0.67	0.64	5.00	0.00	0.40	0.40
5.25	0.67	0.64	5.00	0.00	0.40	0.40
5.30	0.67	0.64	5.00	0.00	0.39	0.39
5.35	0.67	0.64	5.00	0.00	0.39	0.39
5.40	0.67	0.64	5.00	0.00	0.38	0.38
5.45	0.67	0.64	5.00	0.00	0.38	0.38
5.50	0.67	0.64	5.00	0.00	0.37	0.37
5.55	0.67	0.64	5.00	0.00	0.37	0.37
5.60	0.67	0.64	5.00	0.00	0.36	0.36
5.65	0.67	0.64	5.00	0.00	0.36	0.36
5.70	0.67	0.64	5.00	0.00	0.36	0.36
5.75	0.67	0.64	5.00	0.00	0.35	0.35
5.80	0.67	0.64	5.00	0.00	0.35	0.35
5.85	0.67	0.64	5.00	0.00	0.34	0.34
5.90	0.67	0.64	5.00	0.00	0.34	0.34
5.95	0.67	0.64	5.00	0.00	0.33	0.33
6.00	0.67	0.64	5.00	0.00	0.33	0.33
6.05	0.67	0.64	5.00	0.00	0.33	0.33
6.10	0.67	0.64	5.00	0.00	0.32	0.32
6.15	0.67	0.64	5.00	0.00	0.32	0.32
6.20	0.67	0.64	5.00	0.00	0.32	0.32
6.25	0.67	0.64	5.00	0.00	0.31	0.31
6.30	0.67	0.64	5.00	0.00	0.31	0.31
6.35	0.67	0.64	5.00	0.00	0.31	0.31
6.40	0.67	0.64	5.00	0.00	0.30	0.30
6.45	0.67	0.64	5.00	0.00	0.30	0.30
6.50	0.67	0.64	5.00	0.00	0.30	0.30
6.55	0.67	0.64	5.00	0.00	0.29	0.29

						Liquefy.sum
6.60	0.67	0.64	5.00	0.00	0.29	0.29
6.65	0.67	0.64	5.00	0.00	0.29	0.29
6.70	0.67	0.64	5.00	0.00	0.28	0.28
6.75	0.67	0.64	5.00	0.00	0.28	0.28
6.80	0.67	0.64	5.00	0.00	0.28	0.28
6.85	0.67	0.64	5.00	0.00	0.27	0.27
6.90	0.67	0.64	5.00	0.00	0.27	0.27
6.95	0.67	0.64	5.00	0.00	0.27	0.27
7.00	0.67	0.64	5.00	0.00	0.26	0.26
7.05	0.67	0.64	5.00	0.00	0.26	0.26
7.10	0.67	0.64	5.00	0.00	0.26	0.26
7.15	0.67	0.64	5.00	0.00	0.26	0.26
7.20	0.67	0.64	5.00	0.00	0.25	0.25
7.25	0.67	0.64	5.00	0.00	0.25	0.25
7.30	0.67	0.64	5.00	0.00	0.25	0.25
7.35	0.67	0.64	5.00	0.00	0.24	0.24
7.40	0.67	0.64	5.00	0.00	0.24	0.24
7.45	0.67	0.64	5.00	0.00	0.24	0.24
7.50	0.67	0.64	5.00	0.00	0.23	0.23
7.55	0.67	0.64	5.00	0.00	0.23	0.23
7.60	0.67	0.64	5.00	0.00	0.23	0.23
7.65	0.67	0.64	5.00	0.00	0.22	0.22
7.70	0.67	0.64	5.00	0.00	0.22	0.22
7.75	0.67	0.64	5.00	0.00	0.22	0.22
7.80	0.67	0.64	5.00	0.00	0.21	0.21
7.85	0.67	0.64	5.00	0.00	0.21	0.21
7.90	0.67	0.64	5.00	0.00	0.21	0.21
7.95	0.67	0.64	5.00	0.00	0.20	0.20
8.00	0.67	0.64	5.00	0.00	0.20	0.20
8.05	0.67	0.64	5.00	0.00	0.20	0.20
8.10	0.67	0.64	5.00	0.00	0.20	0.20
8.15	0.67	0.64	5.00	0.00	0.19	0.19
8.20	0.67	0.64	5.00	0.00	0.19	0.19
8.25	0.67	0.64	5.00	0.00	0.19	0.19
8.30	0.67	0.64	5.00	0.00	0.18	0.18
8.35	0.67	0.64	5.00	0.00	0.18	0.18
8.40	0.67	0.64	5.00	0.00	0.18	0.18
8.45	0.67	0.64	5.00	0.00	0.17	0.17
8.50	0.67	0.64	5.00	0.00	0.17	0.17
8.55	0.67	0.64	5.00	0.00	0.17	0.17
8.60	0.67	0.64	5.00	0.00	0.16	0.16
8.65	0.67	0.64	5.00	0.00	0.16	0.16
8.70	0.67	0.64	5.00	0.00	0.16	0.16
8.75	0.67	0.64	5.00	0.00	0.16	0.16
8.80	0.67	0.64	5.00	0.00	0.16	0.16
8.85	0.67	0.64	5.00	0.00	0.16	0.16
8.90	0.67	0.64	5.00	0.00	0.16	0.16
8.95	0.67	0.64	5.00	0.00	0.16	0.16
9.00	0.67	0.64	5.00	0.00	0.15	0.15
9.05	0.67	0.64	5.00	0.00	0.15	0.15
9.10	0.67	0.64	5.00	0.00	0.15	0.15
9.15	0.67	0.64	5.00	0.00	0.15	0.15
9.20	0.67	0.64	5.00	0.00	0.15	0.15
9.25	0.67	0.64	5.00	0.00	0.15	0.15
9.30	0.67	0.64	5.00	0.00	0.15	0.15
9.35	0.67	0.64	5.00	0.00	0.15	0.15
9.40	0.67	0.64	5.00	0.00	0.15	0.15
9.45	0.67	0.64	5.00	0.00	0.15	0.15
9.50	0.67	0.64	5.00	0.00	0.15	0.15
9.55	0.67	0.64	5.00	0.00	0.15	0.15
9.60	0.67	0.64	5.00	0.00	0.15	0.15
9.65	0.67	0.64	5.00	0.00	0.15	0.15
9.70	0.67	0.64	5.00	0.00	0.15	0.15
9.75	0.67	0.64	5.00	0.00	0.15	0.15
9.80	0.67	0.64	5.00	0.00	0.15	0.15
9.85	0.67	0.64	5.00	0.00	0.15	0.15
9.90	0.67	0.64	5.00	0.00	0.15	0.15

						Liquefy.sum
9.95	0.67	0.64	5.00	0.00	0.15	0.15
10.00	0.67	0.64	5.00	0.00	0.15	0.15
10.05	0.67	0.64	5.00	0.00	0.15	0.15
10.10	0.67	0.64	5.00	0.00	0.15	0.15
10.15	0.67	0.64	5.00	0.00	0.15	0.15
10.20	0.67	0.64	5.00	0.00	0.15	0.15
10.25	0.67	0.64	5.00	0.00	0.14	0.14
10.30	0.67	0.64	5.00	0.00	0.14	0.14
10.35	0.67	0.63	5.00	0.00	0.14	0.14
10.40	0.67	0.63	5.00	0.00	0.14	0.14
10.45	0.67	0.63	5.00	0.00	0.14	0.14
10.50	0.67	0.63	5.00	0.00	0.14	0.14
10.55	0.67	0.63	5.00	0.00	0.14	0.14
10.60	0.67	0.63	5.00	0.00	0.14	0.14
10.65	0.67	0.63	5.00	0.00	0.14	0.14
10.70	0.67	0.63	5.00	0.00	0.14	0.14
10.75	0.67	0.63	5.00	0.00	0.14	0.14
10.80	0.67	0.63	5.00	0.00	0.14	0.14
10.85	0.67	0.63	5.00	0.00	0.14	0.14
10.90	0.67	0.63	5.00	0.00	0.14	0.14
10.95	0.67	0.63	5.00	0.00	0.14	0.14
11.00	0.67	0.63	5.00	0.00	0.14	0.14
11.05	0.67	0.63	5.00	0.00	0.14	0.14
11.10	0.67	0.63	5.00	0.00	0.14	0.14
11.15	0.67	0.63	5.00	0.00	0.14	0.14
11.20	0.67	0.63	5.00	0.00	0.14	0.14
11.25	0.67	0.63	5.00	0.00	0.13	0.13
11.30	0.67	0.63	5.00	0.00	0.13	0.13
11.35	0.67	0.63	5.00	0.00	0.13	0.13
11.40	0.67	0.63	5.00	0.00	0.13	0.13
11.45	0.67	0.63	5.00	0.00	0.13	0.13
11.50	0.67	0.63	5.00	0.00	0.13	0.13
11.55	0.67	0.63	5.00	0.00	0.13	0.13
11.60	0.67	0.63	5.00	0.00	0.13	0.13
11.65	0.67	0.63	5.00	0.00	0.13	0.13
11.70	0.67	0.63	5.00	0.00	0.13	0.13
11.75	0.67	0.63	5.00	0.00	0.13	0.13
11.80	0.67	0.63	5.00	0.00	0.13	0.13
11.85	0.67	0.63	5.00	0.00	0.13	0.13
11.90	0.67	0.63	5.00	0.00	0.13	0.13
11.95	0.67	0.63	5.00	0.00	0.13	0.13
12.00	0.67	0.63	5.00	0.00	0.13	0.13
12.05	0.67	0.63	5.00	0.00	0.12	0.12
12.10	0.67	0.63	5.00	0.00	0.12	0.12
12.15	0.67	0.63	5.00	0.00	0.12	0.12
12.20	0.67	0.63	5.00	0.00	0.12	0.12
12.25	0.67	0.63	5.00	0.00	0.12	0.12
12.30	0.67	0.63	5.00	0.00	0.12	0.12
12.35	0.67	0.63	5.00	0.00	0.12	0.12
12.40	0.67	0.63	5.00	0.00	0.12	0.12
12.45	0.67	0.63	5.00	0.00	0.12	0.12
12.50	0.67	0.63	5.00	0.00	0.12	0.12
12.55	0.67	0.63	5.00	0.00	0.12	0.12
12.60	0.67	0.63	5.00	0.00	0.12	0.12
12.65	0.67	0.63	5.00	0.00	0.12	0.12
12.70	0.67	0.63	5.00	0.00	0.11	0.11
12.75	0.67	0.63	5.00	0.00	0.11	0.11
12.80	0.67	0.63	5.00	0.00	0.11	0.11
12.85	0.67	0.63	5.00	0.00	0.11	0.11
12.90	0.67	0.63	5.00	0.00	0.11	0.11
12.95	0.67	0.63	5.00	0.00	0.11	0.11
13.00	0.67	0.63	5.00	0.00	0.11	0.11
13.05	0.67	0.63	5.00	0.00	0.11	0.11
13.10	0.67	0.63	5.00	0.00	0.11	0.11
13.15	0.67	0.63	5.00	0.00	0.11	0.11
13.20	0.67	0.63	5.00	0.00	0.11	0.11
13.25	0.67	0.63	5.00	0.00	0.10	0.10

13.30	0.67	0.63	5.00	0.00	0.10	0.10
13.35	0.67	0.63	5.00	0.00	0.10	0.10
13.40	0.67	0.63	5.00	0.00	0.10	0.10
13.45	0.67	0.63	5.00	0.00	0.10	0.10
13.50	0.67	0.63	5.00	0.00	0.10	0.10
13.55	0.67	0.63	5.00	0.00	0.10	0.10
13.60	0.67	0.63	5.00	0.00	0.10	0.10
13.65	0.67	0.63	5.00	0.00	0.10	0.10
13.70	0.67	0.63	5.00	0.00	0.10	0.10
13.75	0.67	0.63	5.00	0.00	0.09	0.09
13.80	0.67	0.63	5.00	0.00	0.09	0.09
13.85	0.67	0.63	5.00	0.00	0.09	0.09
13.90	0.67	0.63	5.00	0.00	0.09	0.09
13.95	0.67	0.63	5.00	0.00	0.09	0.09
14.00	0.67	0.63	5.00	0.00	0.09	0.09
14.05	0.67	0.63	5.00	0.00	0.09	0.09
14.10	0.67	0.63	5.00	0.00	0.09	0.09
14.15	0.67	0.63	5.00	0.00	0.09	0.09
14.20	0.67	0.63	5.00	0.00	0.08	0.08
14.25	0.67	0.63	5.00	0.00	0.08	0.08
14.30	0.67	0.63	5.00	0.00	0.08	0.08
14.35	0.67	0.63	5.00	0.00	0.08	0.08
14.40	0.67	0.63	5.00	0.00	0.08	0.08
14.45	0.67	0.63	5.00	0.00	0.08	0.08
14.50	0.67	0.63	5.00	0.00	0.08	0.08
14.55	0.67	0.63	5.00	0.00	0.08	0.08
14.60	0.67	0.63	5.00	0.00	0.07	0.07
14.65	0.67	0.63	5.00	0.00	0.07	0.07
14.70	0.67	0.63	5.00	0.00	0.07	0.07
14.75	0.67	0.63	5.00	0.00	0.07	0.07
14.80	0.67	0.63	5.00	0.00	0.07	0.07
14.85	0.67	0.63	5.00	0.00	0.07	0.07
14.90	0.67	0.63	5.00	0.00	0.07	0.07
14.95	0.67	0.63	5.00	0.00	0.06	0.06
15.00	0.67	0.63	5.00	0.00	0.06	0.06
15.05	0.67	0.63	5.00	0.00	0.06	0.06
15.10	0.67	0.63	5.00	0.00	0.06	0.06
15.15	0.67	0.63	5.00	0.00	0.06	0.06
15.20	0.67	0.63	5.00	0.00	0.06	0.06
15.25	0.67	0.63	5.00	0.00	0.06	0.06
15.30	0.67	0.63	5.00	0.00	0.06	0.06
15.35	0.67	0.63	5.00	0.00	0.05	0.05
15.40	0.67	0.63	5.00	0.00	0.05	0.05
15.45	0.67	0.63	5.00	0.00	0.05	0.05
15.50	0.67	0.63	5.00	0.00	0.05	0.05
15.55	0.67	0.63	5.00	0.00	0.05	0.05
15.60	0.67	0.63	5.00	0.00	0.05	0.05
15.65	0.67	0.63	5.00	0.00	0.05	0.05
15.70	0.67	0.63	5.00	0.00	0.04	0.04
15.75	0.67	0.63	5.00	0.00	0.04	0.04
15.80	0.67	0.63	5.00	0.00	0.04	0.04
15.85	0.67	0.63	5.00	0.00	0.04	0.04
15.90	0.67	0.63	5.00	0.00	0.04	0.04
15.95	0.67	0.63	5.00	0.00	0.04	0.04
16.00	0.67	0.63	5.00	0.00	0.04	0.04
16.05	0.67	0.63	5.00	0.00	0.03	0.03
16.10	0.67	0.63	5.00	0.00	0.03	0.03
16.15	0.67	0.63	5.00	0.00	0.03	0.03
16.20	0.67	0.63	5.00	0.00	0.03	0.03
16.25	0.67	0.63	5.00	0.00	0.03	0.03
16.30	0.67	0.63	5.00	0.00	0.03	0.03
16.35	0.67	0.63	5.00	0.00	0.02	0.02
16.40	0.67	0.63	5.00	0.00	0.02	0.02
16.45	0.67	0.63	5.00	0.00	0.02	0.02
16.50	0.67	0.63	5.00	0.00	0.02	0.02
16.55	0.67	0.63	5.00	0.00	0.02	0.02
16.60	0.67	0.63	5.00	0.00	0.02	0.02

					Liquefy.sum	
16.65	0.67	0.63	5.00	0.00	0.01	0.01
16.70	0.67	0.63	5.00	0.00	0.01	0.01
16.75	0.67	0.63	5.00	0.00	0.01	0.01
16.80	0.67	0.63	5.00	0.00	0.01	0.01
16.85	0.67	0.63	5.00	0.00	0.01	0.01
16.90	0.67	0.63	5.00	0.00	0.00	0.00
16.95	0.67	0.62	5.00	0.00	0.00	0.00
17.00	0.67	0.62	1.07	0.00	0.00	0.00
17.05	0.67	0.63	1.07	0.00	0.00	0.00
17.10	0.67	0.63	1.07	0.00	0.00	0.00
17.15	0.67	0.63	1.07	0.00	0.00	0.00
17.20	0.67	0.63	1.07	0.00	0.00	0.00
17.25	0.67	0.63	1.07	0.00	0.00	0.00
17.30	0.67	0.63	1.06	0.00	0.00	0.00
17.35	0.67	0.63	1.06	0.00	0.00	0.00
17.40	0.67	0.63	1.06	0.00	0.00	0.00
17.45	0.67	0.63	1.06	0.00	0.00	0.00
17.50	0.67	0.63	1.06	0.00	0.00	0.00
17.55	0.67	0.63	1.06	0.00	0.00	0.00
17.60	0.67	0.63	1.06	0.00	0.00	0.00
17.65	0.67	0.63	1.05	0.00	0.00	0.00
17.70	0.67	0.64	1.05	0.00	0.00	0.00
17.75	0.67	0.64	1.05	0.00	0.00	0.00
17.80	0.67	0.64	1.05	0.00	0.00	0.00
17.85	0.67	0.64	1.05	0.00	0.00	0.00
17.90	0.67	0.64	1.05	0.00	0.00	0.00
17.95	0.67	0.64	1.05	0.00	0.00	0.00
18.00	0.67	0.64	1.05	0.00	0.00	0.00
18.05	0.67	0.64	1.04	0.00	0.00	0.00
18.10	0.67	0.64	1.04	0.00	0.00	0.00
18.15	0.67	0.64	1.04	0.00	0.00	0.00
18.20	0.67	0.64	1.04	0.00	0.00	0.00
18.25	0.67	0.64	1.04	0.00	0.00	0.00
18.30	0.67	0.64	1.04	0.00	0.00	0.00
18.35	0.67	0.65	1.04	0.00	0.00	0.00
18.40	0.67	0.65	1.04	0.00	0.00	0.00
18.45	0.67	0.65	1.04	0.00	0.00	0.00
18.50	0.67	0.65	1.03	0.00	0.00	0.00
18.55	0.67	0.65	1.03	0.00	0.00	0.00
18.60	0.67	0.65	1.03	0.00	0.00	0.00
18.65	0.67	0.65	1.03	0.00	0.00	0.00
18.70	0.67	0.65	1.03	0.00	0.00	0.00
18.75	0.67	0.65	1.03	0.00	0.00	0.00
18.80	0.67	0.65	1.03	0.00	0.00	0.00
18.85	0.67	0.65	1.03	0.00	0.00	0.00
18.90	0.67	0.65	1.03	0.00	0.00	0.00
18.95	0.67	0.65	1.02	0.00	0.00	0.00
19.00	0.67	0.65	1.02	0.00	0.00	0.00
19.05	0.67	0.66	1.02	0.00	0.00	0.00
19.10	0.67	0.66	1.02	0.00	0.00	0.00
19.15	0.67	0.66	1.02	0.00	0.00	0.00
19.20	0.67	0.66	1.02	0.00	0.00	0.00
19.25	0.67	0.66	1.02	0.00	0.00	0.00
19.30	0.67	0.66	1.02	0.00	0.00	0.00
19.35	0.67	0.66	1.02	0.00	0.00	0.00
19.40	0.67	0.66	1.01	0.00	0.00	0.00
19.45	0.67	0.66	1.01	0.00	0.00	0.00
19.50	0.67	0.66	1.01	0.00	0.00	0.00
19.55	0.67	0.66	1.01	0.00	0.00	0.00
19.60	0.67	0.66	1.01	0.00	0.00	0.00
19.65	0.67	0.66	1.01	0.00	0.00	0.00
19.70	0.67	0.66	1.01	0.00	0.00	0.00
19.75	0.67	0.66	1.01	0.00	0.00	0.00
19.80	0.67	0.67	1.01	0.00	0.00	0.00
19.85	0.67	0.67	1.01	0.00	0.00	0.00
19.90	0.67	0.67	1.00	0.00	0.00	0.00
19.95	0.67	0.67	1.00	0.00	0.00	0.00

20.00	0.67	0.67	1.00	0.00	0.00	0.00
20.05	0.67	0.67	1.00	0.00	0.00	0.00
20.10	0.67	0.67	1.00	0.00	0.00	0.00
20.15	0.67	0.67	1.00*	0.00	0.00	0.00
20.20	0.67	0.67	1.00*	0.00	0.00	0.00
20.25	0.67	0.67	1.00*	0.00	0.00	0.00
20.30	0.67	0.67	1.00*	0.00	0.00	0.00
20.35	0.67	0.67	1.00*	0.00	0.00	0.00
20.40	0.67	0.67	1.00*	0.00	0.00	0.00
20.45	0.67	0.67	0.99*	0.00	0.00	0.00
20.50	0.67	0.67	0.99*	0.00	0.00	0.00
20.55	0.67	0.67	0.99*	0.00	0.00	0.00
20.60	0.67	0.68	0.99*	0.00	0.00	0.00
20.65	0.67	0.68	0.99*	0.00	0.00	0.00
20.70	0.67	0.68	0.99*	0.00	0.00	0.00
20.75	0.67	0.68	0.99*	0.00	0.00	0.00
20.80	0.67	0.68	0.99*	0.00	0.00	0.00
20.85	0.67	0.68	0.99*	0.00	0.00	0.00
20.90	0.67	0.68	0.99*	0.00	0.00	0.00
20.95	0.67	0.68	0.99*	0.00	0.00	0.00
21.00	0.67	0.68	0.98*	0.00	0.00	0.00
21.05	0.67	0.68	0.98*	0.00	0.00	0.00
21.10	0.67	0.68	0.98*	0.00	0.00	0.00
21.15	0.67	0.68	0.98*	0.00	0.00	0.00
21.20	0.67	0.68	0.98*	0.00	0.00	0.00
21.25	0.67	0.68	0.98*	0.00	0.00	0.00
21.30	0.67	0.68	0.98*	0.00	0.00	0.00
21.35	0.67	0.68	0.98*	0.00	0.00	0.00
21.40	0.67	0.69	0.98*	0.00	0.00	0.00
21.45	0.67	0.69	0.98*	0.00	0.00	0.00
21.50	0.67	0.69	0.98*	0.00	0.00	0.00
21.55	0.67	0.69	0.98*	0.00	0.00	0.00
21.60	0.67	0.69	0.97*	0.00	0.00	0.00
21.65	0.67	0.69	0.97*	0.00	0.00	0.00
21.70	0.67	0.69	0.97*	0.00	0.00	0.00
21.75	0.67	0.69	0.97*	0.00	0.00	0.00
21.80	0.67	0.69	0.97*	0.00	0.00	0.00
21.85	0.67	0.69	0.97*	0.00	0.00	0.00
21.90	0.67	0.69	0.97*	0.00	0.00	0.00
21.95	0.67	0.69	0.97*	0.00	0.00	0.00
22.00	0.67	0.69	0.97*	0.00	0.00	0.00
22.05	0.67	0.69	0.97*	0.00	0.00	0.00
22.10	0.67	0.69	0.97*	0.00	0.00	0.00
22.15	0.67	0.69	0.97*	0.00	0.00	0.00
22.20	0.67	0.69	0.96*	0.00	0.00	0.00
22.25	0.67	0.69	0.96*	0.00	0.00	0.00
22.30	0.67	0.70	0.96*	0.00	0.00	0.00
22.35	0.67	0.70	0.96*	0.00	0.00	0.00
22.40	0.67	0.70	0.96*	0.00	0.00	0.00
22.45	0.67	0.70	0.96*	0.00	0.00	0.00
22.50	0.67	0.70	0.96*	0.00	0.00	0.00
22.55	0.67	0.70	0.96*	0.00	0.00	0.00
22.60	0.67	0.70	0.96*	0.00	0.00	0.00
22.65	0.67	0.70	0.96*	0.00	0.00	0.00
22.70	0.67	0.70	0.96*	0.00	0.00	0.00
22.75	0.67	0.70	0.96*	0.00	0.00	0.00
22.80	0.67	0.70	0.96*	0.00	0.00	0.00
22.85	0.67	0.70	0.95*	0.00	0.00	0.00
22.90	0.67	0.70	0.95*	0.00	0.00	0.00
22.95	0.67	0.70	0.95*	0.00	0.00	0.00
23.00	0.67	0.70	0.95*	0.00	0.00	0.00
23.05	0.67	0.70	0.95*	0.00	0.00	0.00
23.10	0.67	0.70	0.95*	0.00	0.00	0.00
23.15	0.67	0.70	0.95*	0.00	0.00	0.00
23.20	0.67	0.71	0.95*	0.00	0.00	0.00
23.25	0.67	0.71	0.95*	0.00	0.00	0.00
23.30	0.67	0.71	0.95*	0.00	0.00	0.00

23.35	0.67	0.71	0.95*	0.00	0.00	0.00
23.40	0.67	0.71	0.95*	0.00	0.00	0.00
23.45	0.67	0.71	0.95*	0.00	0.00	0.00
23.50	0.67	0.71	0.94*	0.00	0.00	0.00
23.55	0.67	0.71	0.94*	0.00	0.00	0.00
23.60	0.67	0.71	0.94*	0.00	0.00	0.00
23.65	0.67	0.71	0.94*	0.00	0.00	0.00
23.70	0.67	0.71	0.94*	0.00	0.00	0.00
23.75	0.67	0.71	0.94*	0.00	0.00	0.00
23.80	0.67	0.71	0.94*	0.00	0.00	0.00
23.85	0.67	0.71	0.94*	0.00	0.00	0.00
23.90	0.67	0.71	0.94*	0.00	0.00	0.00
23.95	0.67	0.71	0.94*	0.00	0.00	0.00
24.00	0.67	0.71	0.94*	0.00	0.00	0.00
24.05	0.67	0.71	0.94*	0.00	0.00	0.00
24.10	0.67	0.72	0.94*	0.00	0.00	0.00
24.15	0.67	0.72	0.94*	0.00	0.00	0.00
24.20	0.67	0.72	0.93*	0.00	0.00	0.00
24.25	0.67	0.72	0.93*	0.00	0.00	0.00
24.30	0.67	0.72	0.93*	0.00	0.00	0.00
24.35	0.67	0.72	0.93*	0.00	0.00	0.00
24.40	0.67	0.72	0.93*	0.00	0.00	0.00
24.45	0.67	0.72	0.93*	0.00	0.00	0.00
24.50	0.67	0.72	0.93*	0.00	0.00	0.00
24.55	0.67	0.72	0.93*	0.00	0.00	0.00
24.60	0.67	0.72	0.93*	0.00	0.00	0.00
24.65	0.67	0.72	0.93*	0.00	0.00	0.00
24.70	0.67	0.72	0.93*	0.00	0.00	0.00
24.75	0.67	0.72	0.93*	0.00	0.00	0.00
24.80	0.67	0.72	0.93*	0.00	0.00	0.00
24.85	0.67	0.72	0.93*	0.00	0.00	0.00
24.90	0.67	0.72	0.93*	0.00	0.00	0.00
24.95	0.67	0.72	0.92*	0.00	0.00	0.00
25.00	0.67	0.72	0.92*	0.00	0.00	0.00
25.05	2.00	0.73	5.00	0.00	0.00	0.00
25.10	2.00	0.73	5.00	0.00	0.00	0.00
25.15	2.00	0.73	5.00	0.00	0.00	0.00
25.20	2.00	0.73	5.00	0.00	0.00	0.00
25.25	2.00	0.73	5.00	0.00	0.00	0.00
25.30	2.00	0.73	5.00	0.00	0.00	0.00
25.35	2.00	0.73	5.00	0.00	0.00	0.00
25.40	2.00	0.73	5.00	0.00	0.00	0.00
25.45	2.00	0.73	5.00	0.00	0.00	0.00
25.50	2.00	0.73	5.00	0.00	0.00	0.00
25.55	2.00	0.73	5.00	0.00	0.00	0.00
25.60	2.00	0.73	5.00	0.00	0.00	0.00
25.65	2.00	0.73	5.00	0.00	0.00	0.00
25.70	2.00	0.73	5.00	0.00	0.00	0.00
25.75	2.00	0.73	5.00	0.00	0.00	0.00
25.80	2.00	0.73	5.00	0.00	0.00	0.00
25.85	2.00	0.73	5.00	0.00	0.00	0.00
25.90	2.00	0.73	5.00	0.00	0.00	0.00
25.95	2.00	0.73	5.00	0.00	0.00	0.00
26.00	2.00	0.73	5.00	0.00	0.00	0.00
26.05	2.00	0.74	5.00	0.00	0.00	0.00
26.10	2.00	0.74	5.00	0.00	0.00	0.00
26.15	2.00	0.74	5.00	0.00	0.00	0.00
26.20	2.00	0.74	5.00	0.00	0.00	0.00
26.25	2.00	0.74	5.00	0.00	0.00	0.00
26.30	2.00	0.74	5.00	0.00	0.00	0.00
26.35	2.00	0.74	5.00	0.00	0.00	0.00
26.40	2.00	0.74	5.00	0.00	0.00	0.00
26.45	2.00	0.74	5.00	0.00	0.00	0.00
26.50	2.00	0.74	5.00	0.00	0.00	0.00
26.55	2.00	0.74	5.00	0.00	0.00	0.00
26.60	2.00	0.74	5.00	0.00	0.00	0.00
26.65	2.00	0.74	5.00	0.00	0.00	0.00

26.70	2.00	0.74	5.00	0.00	0.00	0.00
26.75	2.00	0.74	5.00	0.00	0.00	0.00
26.80	2.00	0.74	5.00	0.00	0.00	0.00
26.85	2.00	0.74	5.00	0.00	0.00	0.00
26.90	2.00	0.74	5.00	0.00	0.00	0.00
26.95	2.00	0.74	5.00	0.00	0.00	0.00
27.00	2.00	0.74	5.00	0.00	0.00	0.00
27.05	2.00	0.75	5.00	0.00	0.00	0.00
27.10	2.00	0.75	5.00	0.00	0.00	0.00
27.15	2.00	0.75	5.00	0.00	0.00	0.00
27.20	2.00	0.75	5.00	0.00	0.00	0.00
27.25	2.00	0.75	5.00	0.00	0.00	0.00
27.30	2.00	0.75	5.00	0.00	0.00	0.00
27.35	2.00	0.75	5.00	0.00	0.00	0.00
27.40	2.00	0.75	5.00	0.00	0.00	0.00
27.45	2.00	0.75	5.00	0.00	0.00	0.00
27.50	2.00	0.75	5.00	0.00	0.00	0.00
27.55	2.00	0.75	5.00	0.00	0.00	0.00
27.60	2.00	0.75	5.00	0.00	0.00	0.00
27.65	2.00	0.75	5.00	0.00	0.00	0.00
27.70	2.00	0.75	5.00	0.00	0.00	0.00
27.75	2.00	0.75	5.00	0.00	0.00	0.00
27.80	2.00	0.75	5.00	0.00	0.00	0.00
27.85	2.00	0.75	5.00	0.00	0.00	0.00
27.90	2.00	0.75	5.00	0.00	0.00	0.00
27.95	2.00	0.75	5.00	0.00	0.00	0.00
28.00	2.00	0.75	5.00	0.00	0.00	0.00
28.05	2.00	0.75	5.00	0.00	0.00	0.00
28.10	2.00	0.75	5.00	0.00	0.00	0.00
28.15	2.00	0.76	5.00	0.00	0.00	0.00
28.20	2.00	0.76	5.00	0.00	0.00	0.00
28.25	2.00	0.76	5.00	0.00	0.00	0.00
28.30	2.00	0.76	5.00	0.00	0.00	0.00
28.35	2.00	0.76	5.00	0.00	0.00	0.00
28.40	2.00	0.76	5.00	0.00	0.00	0.00
28.45	2.00	0.76	5.00	0.00	0.00	0.00
28.50	2.00	0.76	5.00	0.00	0.00	0.00
28.55	2.00	0.76	5.00	0.00	0.00	0.00
28.60	2.00	0.76	5.00	0.00	0.00	0.00
28.65	2.00	0.76	5.00	0.00	0.00	0.00
28.70	2.00	0.76	5.00	0.00	0.00	0.00
28.75	2.00	0.76	5.00	0.00	0.00	0.00
28.80	2.00	0.76	5.00	0.00	0.00	0.00
28.85	2.00	0.76	5.00	0.00	0.00	0.00
28.90	2.00	0.76	5.00	0.00	0.00	0.00
28.95	2.00	0.76	5.00	0.00	0.00	0.00
29.00	2.00	0.76	5.00	0.00	0.00	0.00
29.05	2.00	0.76	5.00	0.00	0.00	0.00
29.10	2.00	0.76	5.00	0.00	0.00	0.00
29.15	2.00	0.76	5.00	0.00	0.00	0.00
29.20	2.00	0.76	5.00	0.00	0.00	0.00
29.25	2.00	0.76	5.00	0.00	0.00	0.00
29.30	2.00	0.77	5.00	0.00	0.00	0.00
29.35	2.00	0.77	5.00	0.00	0.00	0.00
29.40	2.00	0.77	5.00	0.00	0.00	0.00
29.45	2.00	0.77	5.00	0.00	0.00	0.00
29.50	2.00	0.77	5.00	0.00	0.00	0.00
29.55	2.00	0.77	5.00	0.00	0.00	0.00
29.60	2.00	0.77	5.00	0.00	0.00	0.00
29.65	2.00	0.77	5.00	0.00	0.00	0.00
29.70	2.00	0.77	5.00	0.00	0.00	0.00
29.75	2.00	0.77	5.00	0.00	0.00	0.00
29.80	2.00	0.77	5.00	0.00	0.00	0.00
29.85	2.00	0.77	5.00	0.00	0.00	0.00
29.90	2.00	0.77	5.00	0.00	0.00	0.00
29.95	2.00	0.77	5.00	0.00	0.00	0.00
30.00	2.00	0.77	5.00	0.00	0.00	0.00

30.05	2.00	0.77	5.00	0.00	0.00	0.00
30.10	2.00	0.77	5.00	0.00	0.00	0.00
30.15	2.00	0.77	5.00	0.00	0.00	0.00
30.20	2.00	0.77	5.00	0.00	0.00	0.00
30.25	2.00	0.77	5.00	0.00	0.00	0.00
30.30	2.00	0.77	5.00	0.00	0.00	0.00
30.35	2.00	0.77	5.00	0.00	0.00	0.00
30.40	2.00	0.77	5.00	0.00	0.00	0.00
30.45	2.00	0.77	5.00	0.00	0.00	0.00
30.50	2.00	0.77	5.00	0.00	0.00	0.00
30.55	2.00	0.77	5.00	0.00	0.00	0.00
30.60	2.00	0.77	5.00	0.00	0.00	0.00
30.65	2.00	0.77	5.00	0.00	0.00	0.00
30.70	2.00	0.77	5.00	0.00	0.00	0.00
30.75	2.00	0.77	5.00	0.00	0.00	0.00
30.80	2.00	0.77	5.00	0.00	0.00	0.00
30.85	2.00	0.77	5.00	0.00	0.00	0.00
30.90	2.00	0.77	5.00	0.00	0.00	0.00
30.95	2.00	0.77	5.00	0.00	0.00	0.00
31.00	2.00	0.77	5.00	0.00	0.00	0.00
31.05	2.00	0.77	5.00	0.00	0.00	0.00
31.10	2.00	0.77	5.00	0.00	0.00	0.00
31.15	2.00	0.77	5.00	0.00	0.00	0.00
31.20	2.00	0.77	5.00	0.00	0.00	0.00
31.25	2.00	0.78	5.00	0.00	0.00	0.00
31.30	2.00	0.78	5.00	0.00	0.00	0.00
31.35	2.00	0.78	5.00	0.00	0.00	0.00
31.40	2.00	0.78	5.00	0.00	0.00	0.00
31.45	2.00	0.78	5.00	0.00	0.00	0.00
31.50	2.00	0.78	5.00	0.00	0.00	0.00
31.55	2.00	0.78	5.00	0.00	0.00	0.00
31.60	2.00	0.78	5.00	0.00	0.00	0.00
31.65	2.00	0.78	5.00	0.00	0.00	0.00
31.70	2.00	0.78	5.00	0.00	0.00	0.00
31.75	2.00	0.78	5.00	0.00	0.00	0.00
31.80	2.00	0.78	5.00	0.00	0.00	0.00
31.85	2.00	0.78	5.00	0.00	0.00	0.00
31.90	2.00	0.78	5.00	0.00	0.00	0.00
31.95	2.00	0.78	5.00	0.00	0.00	0.00
32.00	2.00	0.78	5.00	0.00	0.00	0.00
32.05	2.00	0.78	5.00	0.00	0.00	0.00
32.10	2.00	0.78	5.00	0.00	0.00	0.00
32.15	2.00	0.78	5.00	0.00	0.00	0.00
32.20	2.00	0.78	5.00	0.00	0.00	0.00
32.25	2.00	0.78	5.00	0.00	0.00	0.00
32.30	2.00	0.78	5.00	0.00	0.00	0.00
32.35	2.00	0.78	5.00	0.00	0.00	0.00
32.40	2.00	0.78	5.00	0.00	0.00	0.00
32.45	2.00	0.78	5.00	0.00	0.00	0.00
32.50	2.00	0.78	5.00	0.00	0.00	0.00
32.55	2.00	0.78	5.00	0.00	0.00	0.00
32.60	2.00	0.78	5.00	0.00	0.00	0.00
32.65	2.00	0.78	5.00	0.00	0.00	0.00
32.70	2.00	0.78	5.00	0.00	0.00	0.00
32.75	2.00	0.78	5.00	0.00	0.00	0.00
32.80	2.00	0.78	5.00	0.00	0.00	0.00
32.85	2.00	0.78	5.00	0.00	0.00	0.00
32.90	2.00	0.78	5.00	0.00	0.00	0.00
32.95	2.00	0.78	5.00	0.00	0.00	0.00
33.00	2.00	0.78	5.00	0.00	0.00	0.00
33.05	2.00	0.78	5.00	0.00	0.00	0.00
33.10	2.00	0.78	5.00	0.00	0.00	0.00
33.15	2.00	0.78	5.00	0.00	0.00	0.00
33.20	2.00	0.78	5.00	0.00	0.00	0.00
33.25	2.00	0.78	5.00	0.00	0.00	0.00
33.30	2.00	0.78	5.00	0.00	0.00	0.00
33.35	2.00	0.78	5.00	0.00	0.00	0.00

33.40	2.00	0.78	5.00	0.00	0.00	0.00
33.45	2.00	0.78	5.00	0.00	0.00	0.00
33.50	2.00	0.78	5.00	0.00	0.00	0.00
33.55	2.00	0.78	5.00	0.00	0.00	0.00
33.60	2.00	0.78	5.00	0.00	0.00	0.00
33.65	2.00	0.78	5.00	0.00	0.00	0.00
33.70	2.00	0.78	5.00	0.00	0.00	0.00
33.75	2.00	0.78	5.00	0.00	0.00	0.00
33.80	2.00	0.78	5.00	0.00	0.00	0.00
33.85	2.00	0.78	5.00	0.00	0.00	0.00
33.90	2.00	0.78	5.00	0.00	0.00	0.00
33.95	2.00	0.78	5.00	0.00	0.00	0.00
34.00	2.00	0.78	5.00	0.00	0.00	0.00
34.05	2.00	0.78	5.00	0.00	0.00	0.00
34.10	2.00	0.78	5.00	0.00	0.00	0.00
34.15	2.00	0.78	5.00	0.00	0.00	0.00
34.20	2.00	0.78	5.00	0.00	0.00	0.00
34.25	2.00	0.78	5.00	0.00	0.00	0.00
34.30	2.00	0.78	5.00	0.00	0.00	0.00
34.35	2.00	0.78	5.00	0.00	0.00	0.00
34.40	2.00	0.78	5.00	0.00	0.00	0.00
34.45	2.00	0.78	5.00	0.00	0.00	0.00
34.50	2.00	0.78	5.00	0.00	0.00	0.00
34.55	2.00	0.78	5.00	0.00	0.00	0.00
34.60	2.00	0.78	5.00	0.00	0.00	0.00
34.65	2.00	0.78	5.00	0.00	0.00	0.00
34.70	2.00	0.78	5.00	0.00	0.00	0.00
34.75	2.00	0.78	5.00	0.00	0.00	0.00
34.80	2.00	0.78	5.00	0.00	0.00	0.00
34.85	2.00	0.78	5.00	0.00	0.00	0.00
34.90	2.00	0.78	5.00	0.00	0.00	0.00
34.95	2.00	0.78	5.00	0.00	0.00	0.00
35.00	2.00	0.78	5.00	0.00	0.00	0.00
35.05	2.00	0.78	5.00	0.00	0.00	0.00
35.10	2.00	0.78	5.00	0.00	0.00	0.00
35.15	2.00	0.78	5.00	0.00	0.00	0.00
35.20	2.00	0.78	5.00	0.00	0.00	0.00
35.25	2.00	0.78	5.00	0.00	0.00	0.00
35.30	2.00	0.78	5.00	0.00	0.00	0.00
35.35	2.00	0.78	5.00	0.00	0.00	0.00
35.40	2.00	0.78	5.00	0.00	0.00	0.00
35.45	2.00	0.78	5.00	0.00	0.00	0.00
35.50	2.00	0.78	5.00	0.00	0.00	0.00
35.55	2.00	0.78	5.00	0.00	0.00	0.00
35.60	2.00	0.78	5.00	0.00	0.00	0.00
35.65	2.00	0.78	5.00	0.00	0.00	0.00
35.70	2.00	0.78	5.00	0.00	0.00	0.00
35.75	2.00	0.78	5.00	0.00	0.00	0.00
35.80	2.00	0.78	5.00	0.00	0.00	0.00
35.85	2.00	0.78	5.00	0.00	0.00	0.00
35.90	2.00	0.78	5.00	0.00	0.00	0.00
35.95	2.00	0.78	5.00	0.00	0.00	0.00
36.00	2.00	0.78	5.00	0.00	0.00	0.00
36.05	2.00	0.78	5.00	0.00	0.00	0.00
36.10	2.00	0.78	5.00	0.00	0.00	0.00
36.15	2.00	0.78	5.00	0.00	0.00	0.00
36.20	2.00	0.78	5.00	0.00	0.00	0.00
36.25	2.00	0.78	5.00	0.00	0.00	0.00
36.30	2.00	0.78	5.00	0.00	0.00	0.00
36.35	2.00	0.78	5.00	0.00	0.00	0.00
36.40	2.00	0.78	5.00	0.00	0.00	0.00
36.45	2.00	0.78	5.00	0.00	0.00	0.00
36.50	2.00	0.78	5.00	0.00	0.00	0.00
36.55	2.00	0.78	5.00	0.00	0.00	0.00
36.60	2.00	0.78	5.00	0.00	0.00	0.00
36.65	2.00	0.78	5.00	0.00	0.00	0.00
36.70	2.00	0.78	5.00	0.00	0.00	0.00

36.75	2.00	0.78	5.00	0.00	0.00	0.00
36.80	2.00	0.78	5.00	0.00	0.00	0.00
36.85	2.00	0.78	5.00	0.00	0.00	0.00
36.90	2.00	0.78	5.00	0.00	0.00	0.00
36.95	2.00	0.78	5.00	0.00	0.00	0.00
37.00	2.00	0.78	5.00	0.00	0.00	0.00
37.05	2.00	0.78	5.00	0.00	0.00	0.00
37.10	2.00	0.78	5.00	0.00	0.00	0.00
37.15	2.00	0.78	5.00	0.00	0.00	0.00
37.20	2.00	0.78	5.00	0.00	0.00	0.00
37.25	2.00	0.78	5.00	0.00	0.00	0.00
37.30	2.00	0.78	5.00	0.00	0.00	0.00
37.35	2.00	0.78	5.00	0.00	0.00	0.00
37.40	2.00	0.78	5.00	0.00	0.00	0.00
37.45	2.00	0.78	5.00	0.00	0.00	0.00
37.50	2.00	0.78	5.00	0.00	0.00	0.00
37.55	2.00	0.78	5.00	0.00	0.00	0.00
37.60	2.00	0.78	5.00	0.00	0.00	0.00
37.65	2.00	0.78	5.00	0.00	0.00	0.00
37.70	2.00	0.78	5.00	0.00	0.00	0.00
37.75	2.00	0.78	5.00	0.00	0.00	0.00
37.80	2.00	0.78	5.00	0.00	0.00	0.00
37.85	2.00	0.78	5.00	0.00	0.00	0.00
37.90	2.00	0.78	5.00	0.00	0.00	0.00
37.95	2.00	0.78	5.00	0.00	0.00	0.00
38.00	2.00	0.78	5.00	0.00	0.00	0.00
38.05	2.00	0.78	5.00	0.00	0.00	0.00
38.10	2.00	0.78	5.00	0.00	0.00	0.00
38.15	2.00	0.78	5.00	0.00	0.00	0.00
38.20	2.00	0.78	5.00	0.00	0.00	0.00
38.25	2.00	0.78	5.00	0.00	0.00	0.00
38.30	2.00	0.78	5.00	0.00	0.00	0.00
38.35	2.00	0.78	5.00	0.00	0.00	0.00
38.40	2.00	0.78	5.00	0.00	0.00	0.00
38.45	2.00	0.78	5.00	0.00	0.00	0.00
38.50	2.00	0.78	5.00	0.00	0.00	0.00
38.55	2.00	0.78	5.00	0.00	0.00	0.00
38.60	2.00	0.78	5.00	0.00	0.00	0.00
38.65	2.00	0.78	5.00	0.00	0.00	0.00
38.70	2.00	0.78	5.00	0.00	0.00	0.00
38.75	2.00	0.78	5.00	0.00	0.00	0.00
38.80	2.00	0.78	5.00	0.00	0.00	0.00
38.85	2.00	0.78	5.00	0.00	0.00	0.00
38.90	2.00	0.78	5.00	0.00	0.00	0.00
38.95	2.00	0.78	5.00	0.00	0.00	0.00
39.00	2.00	0.78	5.00	0.00	0.00	0.00
39.05	2.00	0.78	5.00	0.00	0.00	0.00
39.10	2.00	0.78	5.00	0.00	0.00	0.00
39.15	2.00	0.78	5.00	0.00	0.00	0.00
39.20	2.00	0.78	5.00	0.00	0.00	0.00
39.25	2.00	0.78	5.00	0.00	0.00	0.00
39.30	2.00	0.78	5.00	0.00	0.00	0.00
39.35	2.00	0.78	5.00	0.00	0.00	0.00
39.40	2.00	0.78	5.00	0.00	0.00	0.00
39.45	2.00	0.78	5.00	0.00	0.00	0.00
39.50	2.00	0.78	5.00	0.00	0.00	0.00
39.55	2.00	0.78	5.00	0.00	0.00	0.00
39.60	2.00	0.78	5.00	0.00	0.00	0.00
39.65	2.00	0.78	5.00	0.00	0.00	0.00
39.70	2.00	0.78	5.00	0.00	0.00	0.00
39.75	2.00	0.78	5.00	0.00	0.00	0.00
39.80	2.00	0.78	5.00	0.00	0.00	0.00
39.85	2.00	0.78	5.00	0.00	0.00	0.00
39.90	2.00	0.78	5.00	0.00	0.00	0.00
39.95	2.00	0.78	5.00	0.00	0.00	0.00
40.00	2.00	0.78	5.00	0.00	0.00	0.00
40.05	2.00	0.78	5.00	0.00	0.00	0.00

40.10	2.00	0.78	5.00	0.00	0.00	0.00
40.15	2.00	0.78	5.00	0.00	0.00	0.00
40.20	2.00	0.78	5.00	0.00	0.00	0.00
40.25	2.00	0.78	5.00	0.00	0.00	0.00
40.30	2.00	0.78	5.00	0.00	0.00	0.00
40.35	2.00	0.78	5.00	0.00	0.00	0.00
40.40	2.00	0.78	5.00	0.00	0.00	0.00
40.45	2.00	0.78	5.00	0.00	0.00	0.00
40.50	2.00	0.78	5.00	0.00	0.00	0.00
40.55	2.00	0.78	5.00	0.00	0.00	0.00
40.60	2.00	0.78	5.00	0.00	0.00	0.00
40.65	2.00	0.78	5.00	0.00	0.00	0.00
40.70	2.00	0.78	5.00	0.00	0.00	0.00
40.75	2.00	0.78	5.00	0.00	0.00	0.00
40.80	2.00	0.78	5.00	0.00	0.00	0.00
40.85	2.00	0.78	5.00	0.00	0.00	0.00
40.90	2.00	0.78	5.00	0.00	0.00	0.00
40.95	2.00	0.78	5.00	0.00	0.00	0.00
41.00	2.00	0.78	5.00	0.00	0.00	0.00
41.05	2.00	0.78	5.00	0.00	0.00	0.00
41.10	2.00	0.78	5.00	0.00	0.00	0.00
41.15	2.00	0.78	5.00	0.00	0.00	0.00
41.20	2.00	0.78	5.00	0.00	0.00	0.00
41.25	2.00	0.78	5.00	0.00	0.00	0.00
41.30	2.00	0.78	5.00	0.00	0.00	0.00
41.35	2.00	0.78	5.00	0.00	0.00	0.00
41.40	2.00	0.78	5.00	0.00	0.00	0.00
41.45	2.00	0.78	5.00	0.00	0.00	0.00
41.50	2.00	0.78	5.00	0.00	0.00	0.00
41.55	2.00	0.78	5.00	0.00	0.00	0.00
41.60	2.00	0.78	5.00	0.00	0.00	0.00
41.65	2.00	0.78	5.00	0.00	0.00	0.00
41.70	2.00	0.78	5.00	0.00	0.00	0.00
41.75	2.00	0.78	5.00	0.00	0.00	0.00
41.80	2.00	0.78	5.00	0.00	0.00	0.00
41.85	2.00	0.78	5.00	0.00	0.00	0.00
41.90	2.00	0.78	5.00	0.00	0.00	0.00
41.95	2.00	0.78	5.00	0.00	0.00	0.00
42.00	2.00	0.78	5.00	0.00	0.00	0.00
42.05	2.00	0.78	5.00	0.00	0.00	0.00
42.10	2.00	0.78	5.00	0.00	0.00	0.00
42.15	2.00	0.78	5.00	0.00	0.00	0.00
42.20	2.00	0.78	5.00	0.00	0.00	0.00
42.25	2.00	0.78	5.00	0.00	0.00	0.00
42.30	2.00	0.78	5.00	0.00	0.00	0.00
42.35	2.00	0.78	5.00	0.00	0.00	0.00
42.40	2.00	0.78	5.00	0.00	0.00	0.00
42.45	2.00	0.78	5.00	0.00	0.00	0.00
42.50	2.00	0.78	5.00	0.00	0.00	0.00
42.55	2.00	0.78	5.00	0.00	0.00	0.00
42.60	2.00	0.78	5.00	0.00	0.00	0.00
42.65	2.00	0.78	5.00	0.00	0.00	0.00
42.70	2.00	0.78	5.00	0.00	0.00	0.00
42.75	2.00	0.78	5.00	0.00	0.00	0.00
42.80	2.00	0.78	5.00	0.00	0.00	0.00
42.85	2.00	0.78	5.00	0.00	0.00	0.00
42.90	2.00	0.78	5.00	0.00	0.00	0.00
42.95	2.00	0.78	5.00	0.00	0.00	0.00
43.00	2.00	0.78	5.00	0.00	0.00	0.00
43.05	2.00	0.78	5.00	0.00	0.00	0.00
43.10	2.00	0.78	5.00	0.00	0.00	0.00
43.15	2.00	0.78	5.00	0.00	0.00	0.00
43.20	2.00	0.78	5.00	0.00	0.00	0.00
43.25	2.00	0.78	5.00	0.00	0.00	0.00
43.30	2.00	0.78	5.00	0.00	0.00	0.00
43.35	2.00	0.78	5.00	0.00	0.00	0.00
43.40	2.00	0.78	5.00	0.00	0.00	0.00

43.45	2.00	0.78	5.00	0.00	0.00	0.00
43.50	2.00	0.78	5.00	0.00	0.00	0.00
43.55	2.00	0.78	5.00	0.00	0.00	0.00
43.60	2.00	0.78	5.00	0.00	0.00	0.00
43.65	2.00	0.78	5.00	0.00	0.00	0.00
43.70	2.00	0.78	5.00	0.00	0.00	0.00
43.75	2.00	0.78	5.00	0.00	0.00	0.00
43.80	2.00	0.78	5.00	0.00	0.00	0.00
43.85	2.00	0.78	5.00	0.00	0.00	0.00
43.90	2.00	0.78	5.00	0.00	0.00	0.00
43.95	2.00	0.78	5.00	0.00	0.00	0.00
44.00	2.00	0.78	5.00	0.00	0.00	0.00
44.05	2.00	0.78	5.00	0.00	0.00	0.00
44.10	2.00	0.78	5.00	0.00	0.00	0.00
44.15	2.00	0.78	5.00	0.00	0.00	0.00
44.20	2.00	0.77	5.00	0.00	0.00	0.00
44.25	2.00	0.77	5.00	0.00	0.00	0.00
44.30	2.00	0.77	5.00	0.00	0.00	0.00
44.35	2.00	0.77	5.00	0.00	0.00	0.00
44.40	2.00	0.77	5.00	0.00	0.00	0.00
44.45	2.00	0.77	5.00	0.00	0.00	0.00
44.50	2.00	0.77	5.00	0.00	0.00	0.00
44.55	2.00	0.77	5.00	0.00	0.00	0.00
44.60	2.00	0.77	5.00	0.00	0.00	0.00
44.65	2.00	0.77	5.00	0.00	0.00	0.00
44.70	2.00	0.77	5.00	0.00	0.00	0.00
44.75	2.00	0.77	5.00	0.00	0.00	0.00
44.80	2.00	0.77	5.00	0.00	0.00	0.00
44.85	2.00	0.77	5.00	0.00	0.00	0.00
44.90	2.00	0.77	5.00	0.00	0.00	0.00
44.95	2.00	0.77	5.00	0.00	0.00	0.00
45.00	2.00	0.77	5.00	0.00	0.00	0.00
45.05	2.00	0.77	5.00	0.00	0.00	0.00
45.10	2.00	0.77	5.00	0.00	0.00	0.00
45.15	2.00	0.77	5.00	0.00	0.00	0.00
45.20	2.00	0.77	5.00	0.00	0.00	0.00
45.25	2.00	0.77	5.00	0.00	0.00	0.00
45.30	2.00	0.77	5.00	0.00	0.00	0.00
45.35	2.00	0.77	5.00	0.00	0.00	0.00
45.40	2.00	0.77	5.00	0.00	0.00	0.00
45.45	2.00	0.77	5.00	0.00	0.00	0.00
45.50	2.00	0.77	5.00	0.00	0.00	0.00
45.55	2.00	0.77	5.00	0.00	0.00	0.00
45.60	2.00	0.77	5.00	0.00	0.00	0.00
45.65	2.00	0.77	5.00	0.00	0.00	0.00
45.70	2.00	0.77	5.00	0.00	0.00	0.00
45.75	2.00	0.77	5.00	0.00	0.00	0.00
45.80	2.00	0.77	5.00	0.00	0.00	0.00
45.85	2.00	0.77	5.00	0.00	0.00	0.00
45.90	2.00	0.77	5.00	0.00	0.00	0.00
45.95	2.00	0.77	5.00	0.00	0.00	0.00
46.00	2.00	0.77	5.00	0.00	0.00	0.00
46.05	2.00	0.77	5.00	0.00	0.00	0.00
46.10	2.00	0.77	5.00	0.00	0.00	0.00
46.15	2.00	0.77	5.00	0.00	0.00	0.00
46.20	2.00	0.77	5.00	0.00	0.00	0.00
46.25	2.00	0.77	5.00	0.00	0.00	0.00
46.30	2.00	0.77	5.00	0.00	0.00	0.00
46.35	2.00	0.77	5.00	0.00	0.00	0.00
46.40	2.00	0.77	5.00	0.00	0.00	0.00
46.45	2.00	0.77	5.00	0.00	0.00	0.00
46.50	2.00	0.77	5.00	0.00	0.00	0.00
46.55	2.00	0.77	5.00	0.00	0.00	0.00
46.60	2.00	0.77	5.00	0.00	0.00	0.00
46.65	2.00	0.77	5.00	0.00	0.00	0.00
46.70	2.00	0.77	5.00	0.00	0.00	0.00
46.75	2.00	0.77	5.00	0.00	0.00	0.00

						Liquefy.sum
46.80	2.00	0.77	5.00	0.00	0.00	0.00
46.85	2.00	0.77	5.00	0.00	0.00	0.00
46.90	2.00	0.77	5.00	0.00	0.00	0.00
46.95	2.00	0.77	5.00	0.00	0.00	0.00
47.00	2.00	0.77	5.00	0.00	0.00	0.00
47.05	2.00	0.77	5.00	0.00	0.00	0.00
47.10	2.00	0.77	5.00	0.00	0.00	0.00
47.15	2.00	0.77	5.00	0.00	0.00	0.00
47.20	2.00	0.77	5.00	0.00	0.00	0.00
47.25	2.00	0.77	5.00	0.00	0.00	0.00
47.30	2.00	0.77	5.00	0.00	0.00	0.00
47.35	2.00	0.77	5.00	0.00	0.00	0.00
47.40	2.00	0.77	5.00	0.00	0.00	0.00
47.45	2.00	0.77	5.00	0.00	0.00	0.00
47.50	2.00	0.77	5.00	0.00	0.00	0.00
47.55	2.00	0.77	5.00	0.00	0.00	0.00
47.60	2.00	0.77	5.00	0.00	0.00	0.00
47.65	2.00	0.77	5.00	0.00	0.00	0.00
47.70	2.00	0.77	5.00	0.00	0.00	0.00
47.75	2.00	0.77	5.00	0.00	0.00	0.00
47.80	2.00	0.77	5.00	0.00	0.00	0.00
47.85	2.00	0.77	5.00	0.00	0.00	0.00
47.90	2.00	0.77	5.00	0.00	0.00	0.00
47.95	2.00	0.76	5.00	0.00	0.00	0.00
48.00	2.00	0.76	5.00	0.00	0.00	0.00
48.05	2.00	0.76	5.00	0.00	0.00	0.00
48.10	2.00	0.76	5.00	0.00	0.00	0.00
48.15	2.00	0.76	5.00	0.00	0.00	0.00
48.20	2.00	0.76	5.00	0.00	0.00	0.00
48.25	2.00	0.76	5.00	0.00	0.00	0.00
48.30	2.00	0.76	5.00	0.00	0.00	0.00
48.35	2.00	0.76	5.00	0.00	0.00	0.00
48.40	2.00	0.76	5.00	0.00	0.00	0.00
48.45	2.00	0.76	5.00	0.00	0.00	0.00
48.50	2.00	0.76	5.00	0.00	0.00	0.00
48.55	2.00	0.76	5.00	0.00	0.00	0.00
48.60	2.00	0.76	5.00	0.00	0.00	0.00
48.65	2.00	0.76	5.00	0.00	0.00	0.00
48.70	2.00	0.76	5.00	0.00	0.00	0.00
48.75	2.00	0.76	5.00	0.00	0.00	0.00
48.80	2.00	0.76	5.00	0.00	0.00	0.00
48.85	2.00	0.76	5.00	0.00	0.00	0.00
48.90	2.00	0.76	5.00	0.00	0.00	0.00
48.95	2.00	0.76	5.00	0.00	0.00	0.00
49.00	2.00	0.76	5.00	0.00	0.00	0.00
49.05	2.00	0.76	5.00	0.00	0.00	0.00
49.10	2.00	0.76	5.00	0.00	0.00	0.00
49.15	2.00	0.76	5.00	0.00	0.00	0.00
49.20	2.00	0.76	5.00	0.00	0.00	0.00
49.25	2.00	0.76	5.00	0.00	0.00	0.00
49.30	2.00	0.76	5.00	0.00	0.00	0.00
49.35	2.00	0.76	5.00	0.00	0.00	0.00
49.40	2.00	0.76	5.00	0.00	0.00	0.00
49.45	2.00	0.76	5.00	0.00	0.00	0.00
49.50	2.00	0.76	5.00	0.00	0.00	0.00
49.55	2.00	0.76	5.00	0.00	0.00	0.00
49.60	2.00	0.76	5.00	0.00	0.00	0.00
49.65	2.00	0.76	5.00	0.00	0.00	0.00
49.70	2.00	0.76	5.00	0.00	0.00	0.00
49.75	2.00	0.76	5.00	0.00	0.00	0.00
49.80	2.00	0.76	5.00	0.00	0.00	0.00
49.85	2.00	0.76	5.00	0.00	0.00	0.00
49.90	2.00	0.76	5.00	0.00	0.00	0.00
49.95	2.00	0.76	5.00	0.00	0.00	0.00
50.00	2.00	0.76	5.00	0.00	0.00	0.00

* 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

APPENDIX D

PERCOLATION TESTING

APPENDIX D

PERCOLATION TESTING

Percolation testing was performed utilizing exploratory borings BH-22 and BH-29 on June 19, 2013. The continuous pre-soak falling-head test method for water percolation testing was utilized to evaluate soil infiltration rates of the fill and native soils encountered between depths of 0 to 10 feet below the ground surface at the respective boring locations in accordance with LA County Low Impact Development, Best Management Practices Guidelines. The test locations were prepared by placing a perforated 2-inch diameter PVC pipe surrounded by pea gravel after drilling and sampling. Water was filled to the ground surface to pre-soak prior to testing.

The boring was cased using a two-inch diameter perforated casing. Water was added to the bore hole until the water level was as near the ground surface as could be achieved, and allowed to pre-soak for at least 24 hours. After pre-soak, water was added to the bore hole until the water level was as near the ground surface as could be achieved. The water level was measured to the nearest 1/100-foot and recorded every 10 minutes for 30 minutes. There were four (4) sets of measurements taken for each test and each set consisted of at least three (3) measurements (10 minute intervals). The results of the percolation tests are tabulated below.

Table No. D-1, Percolation Test Results

Boring No.	Depth of Boring* (feet)	Predominant Soil Types (USCS)	Average Percolation Rate (inches/hour)	Lowest Percolation Rate (inches/hour)
BH-22	10	Clay (CL)	0.28	0.12
BH-29	10	Clayey Sand (SC)	0.92	0.59

*Approximate

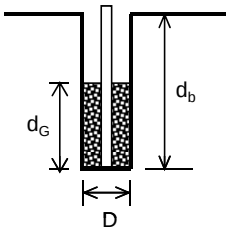
Based on our review of percolation rates, the site soil has poor to low percolation rates for infiltration systems in general. In accordance with County of Los Angeles requirements, the minimum percolation rate for design of infiltration system for storm water management is 0.5 inch per hour. Based on the test results, the site soils in the vicinity of the practice field in the northeastern portion of the site are not considered suitable for infiltration drainage systems. The site soils in the parking lot area in the northwestern portion of the site meet the minimum rate and are considered suitable for percolation drainage systems. The project Civil Engineer should review the raw data of percolation test presented herein to determine specific soil layers and percolation rates for design of the proposed infiltration system. Such systems should be constructed a minimum distance of 10 feet laterally from any existing or future planned building or subsurface structure as not to disturb or undermine foundations. The percolation rates

were determined in general accordance with Los Angeles County guidelines. The detailed percolation test results are shown on the following data sheet.

Percolation Testing

Job Name: Mt. SAC Athletics Complex East
Job No.: 14-31-124-01
Location: BH-22
Test Date: 06.19.14

Test Boring No. **BH-22**
Depth of Boring (d_b): 10.0 feet
Diameter of Boring (D): 0.67 feet
Test Performer: M. Malim



Time of Testing			Water Level Measurement		Water Level Calculations				Percolation Rate Calculations		
Initial Time	Final Time	Time Interval	Initial depth to water	Final depth to water	Initial Height of water column	Final Height of water column	Drop in Height	Average height of water column	Pre-adjusted Percolation Rate	Reduction Factor	Adjusted Percolation Rate
T_i	T_f	ΔT	d_1	d_2	d_i	d_f	$\Delta d = d_i - d_f$	L_{ave}	$k_i = \Delta d / \Delta T$	R_f	$k = k_i / R_f$
		(hr)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(inch/hr)		(inch/hr)
Presoak	6/18/2014	24									
Percolation Test											
7:32:00 AM	7:42:00 AM	0.17	0.00	0.30	10.00	9.70	0.30	9.85	21.60	30.4	0.71
7:42:00 AM	7:52:00 AM	0.17	0.30	0.40	9.70	9.60	0.10	9.65	7.20	29.8	0.24
7:52:00 AM	8:02:00 AM	0.17	0.40	0.45	9.60	9.55	0.05	9.58	3.60	29.6	0.12
8:02:00 AM	8:12:00 AM	0.17	0.45	0.50	9.55	9.50	0.05	9.53	3.60	29.4	0.12
8:12:00 AM	8:22:00 AM	0.17	0.50	0.55	9.50	9.45	0.05	9.48	3.60	29.3	0.12
8:22:00 AM	8:32:00 AM	0.17	0.55	0.60	9.45	9.40	0.05	9.43	3.60	29.1	0.12
8:32:00 AM	8:42:00 AM	0.17	0.60	0.70	9.40	9.30	0.10	9.35	7.20	28.9	0.25
8:42:00 AM	8:52:00 AM	0.17	0.70	0.80	9.30	9.20	0.10	9.25	7.20	28.6	0.25
8:52:00 AM	9:02:00 AM	0.17	0.80	0.90	9.20	9.10	0.10	9.15	7.20	28.3	0.25
9:05:00 AM	9:15:00 AM	0.17	0.00	0.25	10.00	9.75	0.25	9.88	18.00	30.5	0.59
9:15:00 AM	9:25:00 AM	0.17	0.25	0.35	9.75	9.65	0.10	9.70	7.20	30.0	0.24
9:25:00 AM	9:35:00 AM	0.17	0.35	0.40	9.65	9.60	0.05	9.63	3.60	29.7	0.12
9:37:00 AM	9:47:00 AM	0.17	0.00	0.25	10.00	9.75	0.25	9.88	18.00	30.5	0.59
9:47:00 AM	9:57:00 AM	0.17	0.25	0.35	9.75	9.65	0.10	9.70	7.20	30.0	0.24
9:57:00 AM	10:07:00 AM	0.17	0.35	0.40	9.65	9.60	0.05	9.63	3.60	29.7	0.12
10:10:00 AM	10:20:00 AM	0.17	0.00	0.25	10.00	9.75	0.25	9.88	18.00	30.5	0.59
10:20:00 AM	10:30:00 AM	0.17	0.25	0.35	9.75	9.65	0.10	9.70	7.20	30.0	0.24
10:30:00 AM	10:40:00 AM	0.17	0.35	0.40	9.65	9.60	0.05	9.63	3.60	29.7	0.12

Note: Reduction Factor, $R_f = (2*d_i - \Delta d)/D + 1$

Lowest Percolation Rate = 0.12 inch/hr

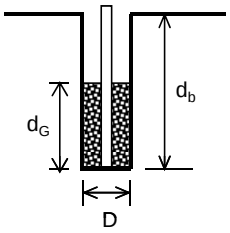
Average Percolation Rate = 0.28 inch/hr

Reference: Los Angeles County (2011). Adminstrative Manual - Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting, 01/03/11.

Percolation Testing

Job Name: Mt. SAC Athletics Complex East
Job No.: 14-31-124-01
Location: BH-29
Test Date: 06.19.14

Test Boring No. **BH-29**
Depth of Boring (d_b): 10.0 feet
Diameter of Boring (D): 0.67 feet
Test Performer: M. Malim



Time of Testing			Water Level Measurement		Water Level Calculations				Percolation Rate Calculations		
Initial Time	Final Time	Time Interval	Initial depth to water	Final depth to water	Initial Height of water column	Final Height of water column	Drop in Height	Average height of water column	Pre-adjusted Percolation Rate	Reduction Factor	Adjusted Percolation Rate
T_i	T_f	ΔT	d_1	d_2	d_i	d_f	$\Delta d = d_i - d_f$	L_{ave}	$k_i = \Delta d / \Delta T$	R_f	$k = k_i / R_f$
		(hr)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(inch/hr)		(inch/hr)
Presoak	6/18/2014	24									
Percolation Test											
7:38:00 AM	7:48:00 AM	0.17	0.10	0.60	9.90	9.40	0.50	9.65	36.00	29.8	1.21
7:48:00 AM	7:58:00 AM	0.17	0.60	1.00	9.40	9.00	0.40	9.20	28.80	28.5	1.01
7:58:00 AM	8:08:00 AM	0.17	1.00	1.30	9.00	8.70	0.30	8.85	21.60	27.4	0.79
8:08:00 AM	8:18:00 AM	0.17	1.30	1.60	8.70	8.40	0.30	8.55	21.60	26.5	0.81
8:18:00 AM	8:28:00 AM	0.17	1.60	2.00	8.40	8.00	0.40	8.20	28.80	25.5	1.13
8:28:00 AM	8:38:00 AM	0.17	2.00	2.20	8.00	7.80	0.20	7.90	14.40	24.6	0.59
8:38:00 AM	8:48:00 AM	0.17	2.20	2.40	7.80	7.60	0.20	7.70	14.40	24.0	0.60
8:48:00 AM	8:58:00 AM	0.17	2.40	2.60	7.60	7.40	0.20	7.50	14.40	23.4	0.62
8:58:00 AM	9:08:00 AM	0.17	2.60	2.80	7.40	7.20	0.20	7.30	14.40	22.8	0.63
9:10:00 AM	9:20:00 AM	0.17	0.25	0.80	9.75	9.20	0.55	9.48	39.60	29.3	1.35
9:20:00 AM	9:30:00 AM	0.17	0.80	1.25	9.20	8.75	0.45	8.98	32.40	27.8	1.17
9:30:00 AM	9:40:00 AM	0.17	1.25	1.50	8.75	8.50	0.25	8.63	18.00	26.7	0.67
9:45:00 AM	9:55:00 AM	0.17	0.00	0.60	10.00	9.40	0.60	9.70	43.20	30.0	1.44
9:55:00 AM	10:05:00 AM	0.17	0.60	1.00	9.40	9.00	0.40	9.20	28.80	28.5	1.01
10:05:00 AM	10:15:00 AM	0.17	1.00	1.25	9.00	8.75	0.25	8.88	18.00	27.5	0.65
10:17:00 AM	10:27:00 AM	0.17	0.25	0.75	9.75	9.25	0.50	9.50	36.00	29.4	1.23
10:27:00 AM	10:37:00 AM	0.17	0.75	1.10	9.25	8.90	0.35	9.08	25.20	28.1	0.90
10:37:00 AM	10:47:00 AM	0.17	1.10	1.40	8.90	8.60	0.30	8.75	21.60	27.1	0.80

Note: Reduction Factor, $R_f = (2*d_i - \Delta d)/D + 1$

Lowest Percolation Rate = 0.59 inch/hr
Average Percolation Rate = 0.92 inch/hr

Reference: Los Angeles County (2011). Adminstrative Manual - Low Impact Development Best Management Practice Guideline for Design, Investigation, and Reporting, 01/03/11.

APPENDIX E

EARTHWORK SPECIFICATIONS

APPENDIX E

EARTHWORK SPECIFICATIONS

E1.1 Scope of Work

The work includes all labor, supplies and construction equipment required to construct the building pads in a good, workmanlike manner, as shown on the drawings and herein specified. The major items of work covered in this section include the following:

- Site Inspection
- Authority of Geotechnical Engineer
- Site Clearing
- Excavations
- Preparation of Fill Areas
- Placement and Compaction of Fill
- Observation and Testing

E1.2 Site Inspection

1. The Contractor shall carefully examine the site and make all inspections necessary, in order to determine the full extent of the work required to make the completed work conform to the drawings and specifications. The Contractor shall satisfy himself as to the nature and location of the work, ground surface and the characteristics of equipment and facilities needed prior to and during prosecution of the work. The Contractor shall satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the drawings, or between the drawings and specifications must be brought to the Owner's attention in order to clarify the exact nature of the work to be performed.

2. This *Geoseismic/Geotechnical Study Report* by Converse Consultants may be used as a reference to the surface and subsurface conditions on this project. The information presented in this report is intended for use in design and is subject to confirmation of the conditions encountered during construction. The exploration logs and related information depict subsurface conditions only at the particular time and location designated on the boring logs. Subsurface conditions at other locations may differ from conditions encountered at the exploration locations. In addition, the passage of time may result in a change in subsurface conditions at the exploration locations. Any review of this information shall not relieve the Contractor from performing such independent investigation and evaluation to satisfy himself as to the nature of the surface and subsurface

conditions to be encountered and the procedures to be used in performing his work.

E1.3 Authority of the Geotechnical Engineer

1. The Geotechnical Engineer will observe the placement of compacted fill and will take sufficient tests to evaluate the uniformity and degree of compaction of filled ground.

2. As the Owner's representative, the Geotechnical Engineer will (a) have the authority to cause the removal and replacement of loose, soft, disturbed and other unsatisfactory soils and uncontrolled fill; (b) have the authority to approve the preparation of native ground to receive fill material; and (c) have the authority to approve or reject soils proposed for use in building areas.

3. The Civil Engineer and/or Owner will decide all questions regarding (a) the interpretation of the drawings and specifications, (b) the acceptable fulfillment of the contract on the part of the Contractor and (c) the matters of compensation.

E1.4 Site Clearing

1. Clearing and grubbing shall consist of the removal from building areas to be graded of all existing structures, pavement, utilities, and vegetation.

2. Organic and inorganic materials resulting from the clearing and grubbing operations shall be hauled away from the areas to be graded.

E1.5 Excavations

1. Based on observations made during our field explorations, the surficial soils can be excavated with conventional earthwork equipment.

E1.6 Preparation of Fill Areas

1. All organic material, organic soils, incompetent alluvium, undocumented fill soils and debris should be removed from the proposed building areas.

2. In order to provide a relative uniform bearing material below shallow foundations, over-excavation and re-compaction of below the foundations and slab-on-grade are recommended. We recommend a minimum 3 feet of onsite soils below the bottom of foundations should be removed, moisture-conditioned if necessary, and replaced as compacted fill. At least the six (6) inches of soil at bottom of over-excavation, cut and transition areas should be scarified and compacted. All undocumented fill should be removed and replaced with compacted fill. The

excavation to remove unsuitable soils should be extended to five (5) feet beyond the building limits and appendages where space is available. All loose, soft or disturbed earth materials should be removed from the bottom of excavations before placing structural fill. The actual depth of removal should be determined based on observations made during grading. After the required removals have been made, the exposed native earth materials shall be excavated to provide a zone of structural fill for the support of footings, slabs-on-grade, and exterior flatwork. The fill thickness under structures should not vary.

3. The subgrade in all areas to receive fill shall be scarified to a minimum depth of six (6) inches, the soil moisture adjusted within three (3) percent of the optimum moisture for granular soils and at above approximately three (3) percent of the optimum moisture for fine-grained soils, and then compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557 test method. Scarification may be terminated on moderately hard to hard, cemented earth materials with the approval of the Geotechnical Engineer.

4. Compacted fill may be placed on native soils that have been properly scarified and recompacted as discussed above.

5. All areas to receive compacted fill will be observed and approved by the Geotechnical Engineer before the placement of fill.

E1.7 Placement and Compaction of Fill

1. Compacted fill placed for the support of footings, slabs-on-grade, exterior concrete flatwork, and driveways will be considered structural fill. Structural fill may consist of approved on-site soils or imported fill that meets the criteria indicated below.

2. Fill consisting of selected on-site earth materials or imported soils approved by the Geotechnical Engineer shall be placed in layers on approved earth materials. Soils used as compacted structural fill shall have the following characteristics:

    a. All fill soil particles shall not exceed three (3) inches in nominal size, and shall be free of organic matter and miscellaneous inorganic debris and inert rubble.

    b. Imported fill materials shall have an Expansion Index (EI) less than 20. All imported fill should be compacted to at least 90 percent of the laboratory maximum dry density (ASTM Standard D1557) at about three (3) percent above optimum moisture for fine grained soils, and within three (3) percent of optimum for granular soils.

3. Fill soils shall be evenly spread in maximum 8-inch lifts, watered or dried as necessary, mixed and compacted to at least the density specified below. The fill shall be placed and compacted on a horizontal plane, unless otherwise approved by the Geotechnical Engineer.

4. All fill placed at the site shall be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557 test method. The on-site soils shall be moisture conditioned within three (3) percent of the optimum moisture for granular soils and at above approximately three (3) percent of the optimum moisture for fine-grained soils. At least the upper 12 inches of subgrade soils underneath the concrete apron, pavement and parking areas should be compacted to a minimum of 95 percent relative compaction.

5. Fill exceeding five (5) feet in height shall not be placed on native slopes that are steeper than 5:1 horizontal:vertical (H:V). Where native slopes are steeper than 5:1 H:V, and the height of the fill is greater than five (5) feet, the fill shall be benched into competent materials. The height and width of the benches shall be at least two (2) feet.

6. Representative samples of materials being used, as compacted fill will be analyzed in the laboratory by the Geotechnical Engineer to obtain information on their physical properties. Maximum laboratory density of each soil type used in the compacted fill will be determined by the ASTM Standard D1557 compaction method.

7. Fill materials shall not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations shall not resume until the Geotechnical Engineer approves the moisture and density conditions of the previously placed fill.

8. It shall be the Grading Contractor's obligation to take all measures deemed necessary during grading to provide erosion control devices in order to protect slope areas and adjacent properties from storm damage and flood hazard originating on this project. It shall be the contractor's responsibility to maintain slopes in their as-graded form until all slopes are in satisfactory compliance with job specifications, all berms have been properly constructed, and all associated drainage devices meet the requirements of the Civil Engineer.

E1.8 Trench Backfill

The following specifications are recommended to provide a basis for quality control during the placement of trench backfill.

1. Trench excavations to receive backfill shall be free of trash, debris or other unsatisfactory materials at the time of backfill placement.

2. Trench backfill shall be compacted to a minimum relative compaction of 90 percent as per ASTM Standard D1557 test method.

3. Rocks larger than one (1) inch should not be placed within 12 inches of the top of the pipeline or within the upper 12 inches of pavement or structure subgrade. No more than 30 percent of the backfill volume shall be larger than 3/4-inch in largest dimension diameter, and rocks shall be well mixed with finer soil.

4. The pipe design engineer should select bedding material for the pipe. Bedding materials generally should have a Sand Equivalent (SE) greater than or equal to 30, as determined by the ASTM Standard D2419 test method.

5. Trench backfill shall be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers, or mechanical tampers, to achieve the density specified herein. The backfill materials shall be brought to within three (3) percent of optimum moisture content for granular soils and fine-grained soils, then placed in horizontal layers. The thickness of uncompacted layers should not exceed eight (8) inches. Each layer shall be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.

6. The contractor shall select the equipment and processes to be used to achieve the specified density without damage to adjacent ground and completed work.

7. The field density of the compacted soil shall be measured by the ASTM Standard D1556 or ASTM Standard D2922 test methods or equivalent.

8. Observation and field tests should be performed by Converse during construction to confirm that the required degree of compaction has been obtained. Where compaction is less than that specified, additional compactive effort shall be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

9. It should be the responsibility of the Contractor to maintain safe conditions during cut and/or fill operations.

10. Trench backfill shall not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations shall not be resumed until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are as previously specified.

E1.9 Observation and Testing

1. During the progress of grading, the Geotechnical Engineer will provide observation of the fill placement operations.

2. Field density tests will be made during grading to provide an opinion on the degree of compaction being obtained by the contractor. Where compaction of less than specified herein is indicated, additional compactive effort with adjustment of the moisture content shall be made as necessary, until the required degree of compaction is obtained.

3. A sufficient number of field density tests will be performed to provide an opinion to the degree of compaction achieved. In general, density tests will be performed on each one-foot lift of fill, but not less than one for each 500 cubic yards of fill placed.

APPENDIX F

GUIDE SPECIFICATIONS FOR INSTALLATION AND ACCEPTANCE OF TIE-BACK ANCHORS

APPENDIX F

GUIDE SPECIFICATIONS FOR INSTALLATION AND ACCEPTANCE OF TIEBACK ANCHORS

F1.1 Installation

1. Tie-back installation shall be performed during continuous observation by Geotechnical Consultant to confirm that the recommended earth materials are penetrated, that the dimensions of the installed anchors are at least as large as that indicated on the shoring plan, and that anchor installation has been performed as specified. The Contractor shall provide access and necessary facilities, including lighting, at their expense, to accommodate observations.

2. All anchors shall be installed at the specified locations, to the required depth, and at the specified angle of inclination. A tolerance of 3o will be permitted on the required angle of inclination.

3. After drilling, all holes shall be cleaned of loose soils. Concrete shall be placed by pumping from the tip of the anchor to the active wedge. Concrete placement shall begin within four hours after completion of drilling. The portion of the anchor within the active wedge shall be backfilled with sand-cement slurry after the anchor has been tested as specified below. However, if excessive caving occurs, the active wedge portion of the excavation can be filled with slurry as the casing is pulled. A zone of soft soil shall (in this case) be placed between the anchor and slurry (before testing).

4. If a hollow-stem auger or casing is used due to caving, concrete shall be placed by pumping as the auger or casing is withdrawn while always maintaining a head of concrete inside the casing or auger.

5. Concrete placement shall be continuous without interruption, and at such a rate that fresh concrete will not be deposited on concrete hardened sufficiently to form seams and planes of weakness.

6. Any anchor deemed by the Owner or Geotechnical Consultant to be defective shall be replaced with substitute anchor(s) as directed by the Owner or Shoring Designer. The cost of installation of such substitute anchors shall be borne by the Contractor. Costs associated with analysis and design of substitute anchor(s) shall also be borne by the Contractor.

F1.2 Acceptance Criteria

1. Actual capacities of anchors shall be determined by testing designated Test Anchors and all Production Anchors. Testing of anchors will enable evaluation of the applicability of design values for the chosen method of tieback construction.

2. All anchors shall be check-tested to at least 150% of the designed working load in accordance with the following procedures:

    a. Test load anchors to 150% of the design-working load, incrementally noting loads, tendon extensions and soldier pile deflections. Hold load for 15 minutes. After pulling slack, the anchor movement shall not exceed 0.10 inch during the 15-minute load period. If the deflection is acceptable, reduce load to 100% of the design load and lock off.

    b. Where an anchor shows excessive movement for additional 15-minute intervals, the load should be reduced until the rate of movement is 0.10 inch per 15 minutes or less. The load at which acceptable movement is attained should be divided by 1.5 to establish the working load of the anchor and additional measures taken to carry the required load.

3. Geotechnical Consultant shall designate at least 5% of all proposed anchors as 200% Test Anchors. Additional anchor steel reinforcement will likely be required for the 200 percent load test anchors, and should be appropriately considered prior to anchor installation. Half of the 200% Test Anchors shall be tested for 30 minutes. The remaining Test Anchors shall be tested for a 24-hour period. Test anchors shall be tested in the following manner:

    a. For the 30-minute test anchors, incrementally load the anchors to 200% of the design-working load noting loads, tendon/bar extensions and soldier pile deflections. Hold load for 30 minutes. Anchor movement shall not exceed 0.3 inch during the 30-minute load period. If the deflection is acceptable, reduce load to design load and lock off; otherwise, reduce the test load by 50% and repeat this step.

    b. For 24-hour test anchors, incrementally load to 200% and hold for 24 hours; check load after 24 hours. If a pre-stress loss of 8% or less is recorded, restore load to 100% of working load and lock off. If loss of pre-stress exceeds 8%, restore load to 150% of working load and hold for an additional 24 hours. Check load after second 24-hour hold and, if loss of pre-stress is less than 8%; restore to 100% and lock off as before.

    c. Where an anchor shows a continuous loss of pre-stress during a subsequent 24-hour period, the test load shall continue to be reduced by

50% until loss of pre-stress is negligible. Then the test load shall be divided by 1.5 to establish the working load of that anchor and additional measures taken to carry the required shoring load.

4. Any anchor pulled more than 12 inches shall not be used.

5. Immediately after testing, the active wedge portion of tieback excavations should be filled with slurry.

APPENDIX G

GUIDE SPECIFICATIONS FOR DRILLED PILE INSTALLATION

APPENDIX G

GUIDE SPECIFICATIONS FOR DRILLED PILE INSTALLATION

It should be the responsibility of the contractor to select proper construction equipment and method to correctly install the piles based on his own interpretation of the information presented in this report. The following recommendations are provided as a guide for preparing plans and specifications and for quality control:

Drilled Piles

- Prior to starting any foundation work, staking should be checked by the project Civil/Structural Engineer. Variations in the alignment from the vertical greater than ¼-inch per foot of length should not be permitted. Any pile installed having a center more than three (3) inches off plan centerline will require structural analysis.

- Some variations in the final pile tip elevations should be expected. The actual tip elevation should be determined by the project geotechnical engineer during excavation based on observation of the actual field conditions.

- Sandy alluvial soils with gravel were encountered during our filed exploration. Layers with cobbles and boulders also exist within the alluvial soils and will be encountered during drilling of CIDH piles.

- Caving during excavations may occur within the sandy soils. Casing, or other methods approved by the project geotechnical consultant, should be used to support the sides of the pile excavation. Casing should be used at the discretion of the contractor. Casing should be advanced as drilling proceeds by drilling with a flight or bucket auger smaller in diameter than the inside of the casing. Occasional hammering may be required to advance the casing with the excavation. Casing should be pulled as the concrete is being poured, while always maintaining a head of concrete inside the casing. Drilling fluids should not be used to support the sides of the excavation without prior approval by the project geotechnical consultants. The contractor should have equipment on-site with sufficient pulling capacity to pull the casing at the proper time. The casing should have outside diameter not less than the specified diameter of the pile.

- In the event that the pile excavation becomes bell-shaped and cannot be advanced due to severe caving, the caved region may be filled with sand and Portland Cement slurry. Drilling may continue when the slurry has reached its initial set. In this case, it may be prudent to utilize casing or other special methods to facilitate continued drilling after the slurry has set. Sufficient space should be provided in the pier-

reinforcing cage during fabrication to allow insertion of a concrete pump pipe or tremie tube for concrete placement.

- The bottoms of the excavations should be cleaned of any loose cuttings before placing concrete. All applicable state and federal OSHA safety regulations must be satisfied during construction.

- The reinforcing bars in the piles should have a minimum concrete cover of 3 inches. Sufficient space should be provided in the reinforcing cage to allow insertion of a concrete tremie tube for concrete placement.

- The reinforcing cage must be carefully placed in uncased holes to prevent gouging of the sides. This will cause loose material to fall into the hole. The cage of reinforcing steel should be placed to the depth required by the plans, and adequately supported at the top.

- Pile shafts spaced closer than six (6) diameters center-to-center shall be drilled and filled with concrete alternatively, allowing at least 12 hours after concrete placement in one shaft before drilling of an adjacent shaft.

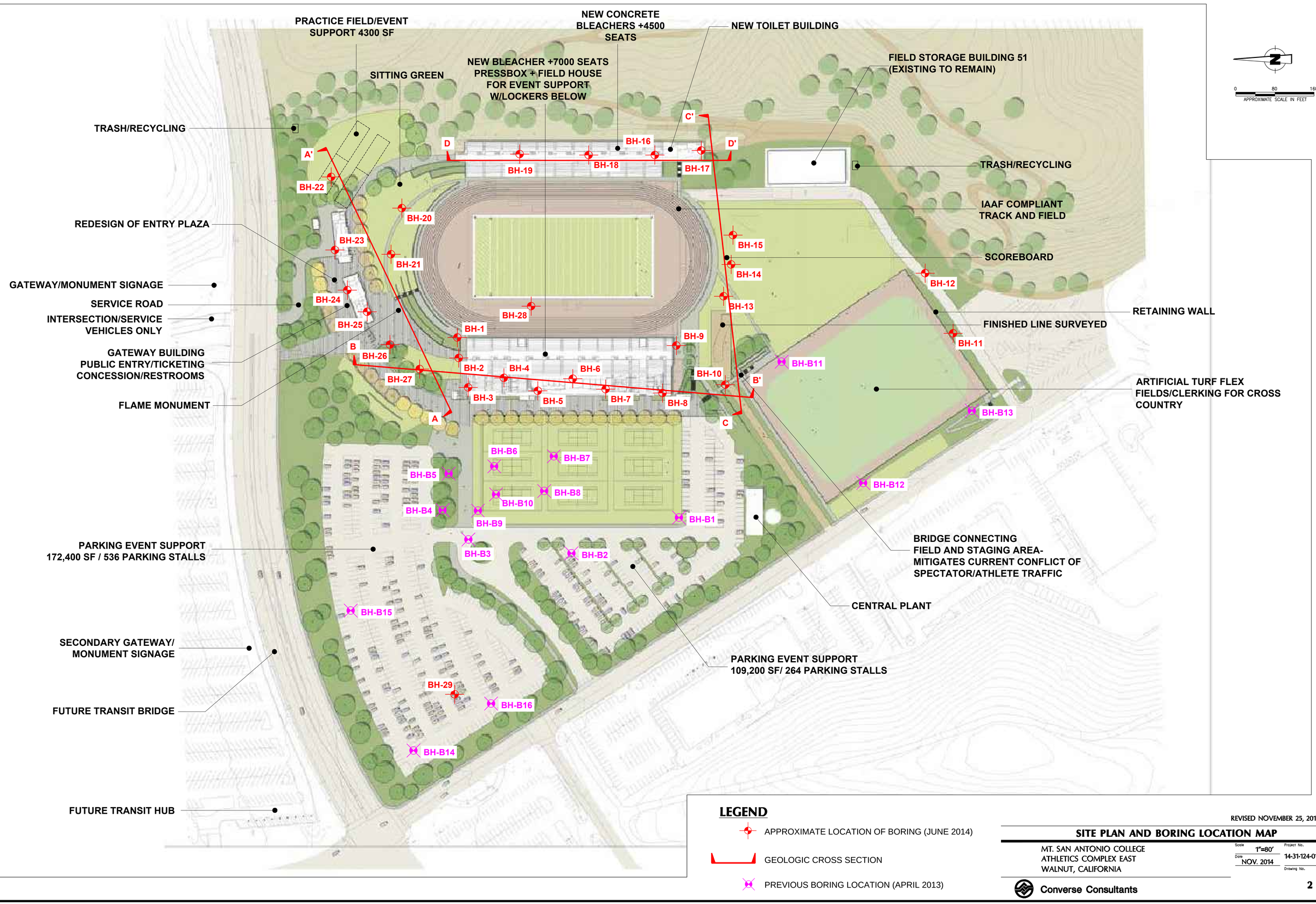
- All piles should be concreted immediately after drilling and clean out. Concrete should be placed through a tremie to prevent segregation and unnecessary splashing on the reinforcing steel. The concrete should be directed towards the center of the pile. Free fall of concrete should not exceed three (3) feet.

- The concrete should be flowable, non-segregating concrete with slump near the maximum allowable to obtain satisfactory consolidation without vibration, and to facilitate filling of all voids outside the casing. Concrete should not exhibit rapid slump loss. The slump for uncased drilled piles should be determined by the structural engineer. When casing is withdrawn, the minimum slump should be 6.0-in for specially designed concrete with retard to prevent arching of concrete during casing withdrawal, or setting of the concrete until after the casing is withdrawn, should be used. The slump can be 8±1 inches for concrete placed under groundwater determined by the structural engineer.

- Casing should be pulled as the concrete is being poured, while always maintaining a head of concrete inside the casing. The bottom of the casing should be maintained not more than five (5) feet nor less than one (1) foot below the top of the concrete during withdrawal and placing operations.

- Place concrete in pile in one continuous operation. Care should be taken to ensure that the concrete in the hole is dense and homogeneous. After the hole has been filled with concrete, the top 10 feet or the length of the reinforcing, whichever is greater should be vibrated.

- Drilled pile installation shall be performed under continuous observation by the project geotechnical consultant to confirm that the subsurface soils are similar to the soils encountered during our field study, which have formed the basis of our pier design recommendations. Further, the soils consultant should confirm that the dimensions of the installed piers are at least as large as those indicated on the foundation plan, and that pier installation has been performed as specified in this report. The contractor shall provide access and necessary facilities, including droplights, at his expense, to accommodate pier observations.
- Drilled pile installation shall be performed such that compliance with all safety rules and requirements is achieved. Drilling equipment, casing, reinforcement, and other items required for installation shall be kept at a safe distance from all overhead power lines and utilities.



LEGEND

- APPROXIMATE LOCATION OF BORING (JUNE 2014)
- GEOLOGIC CROSS SECTION
- PREVIOUS BORING LOCATION (APRIL 2013)

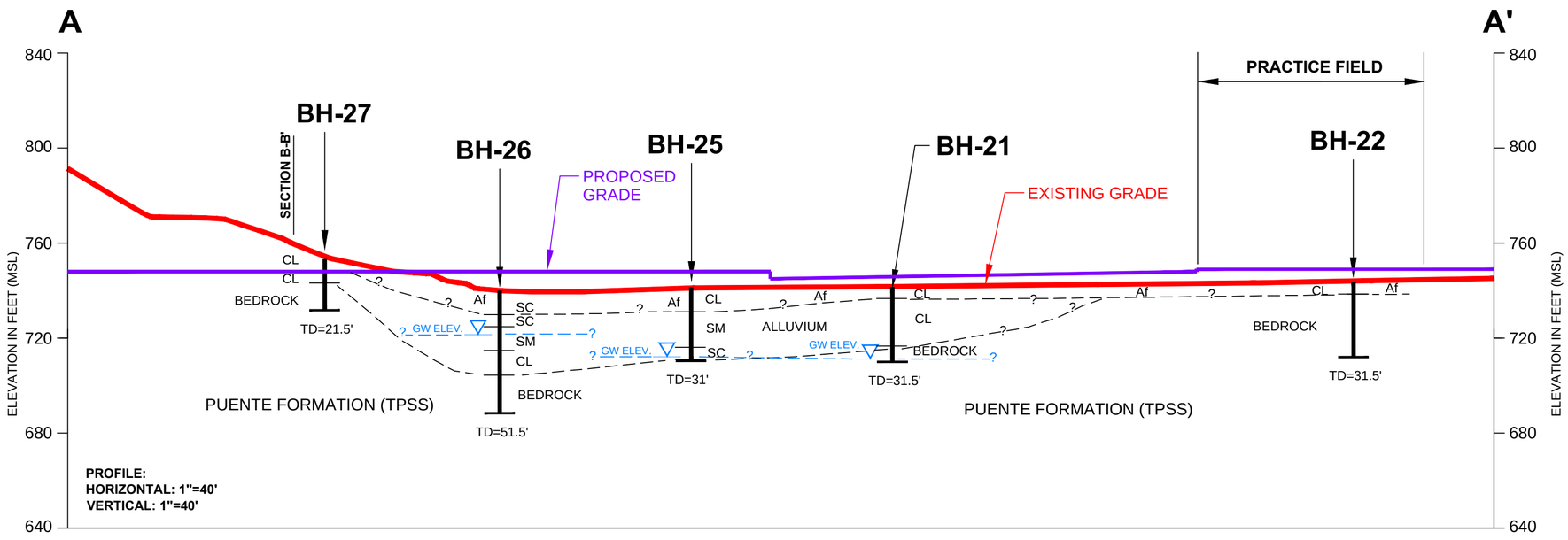
REVISED NOVEMBER 25, 2014

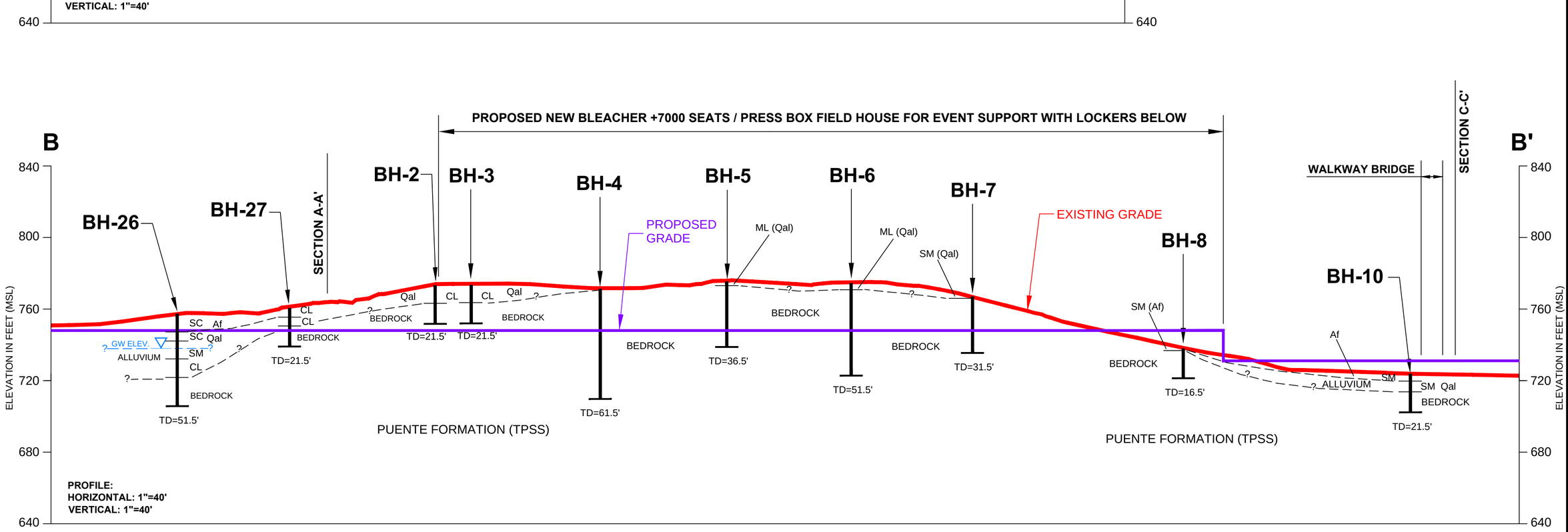
SITE PLAN AND BORING LOCATION MAP

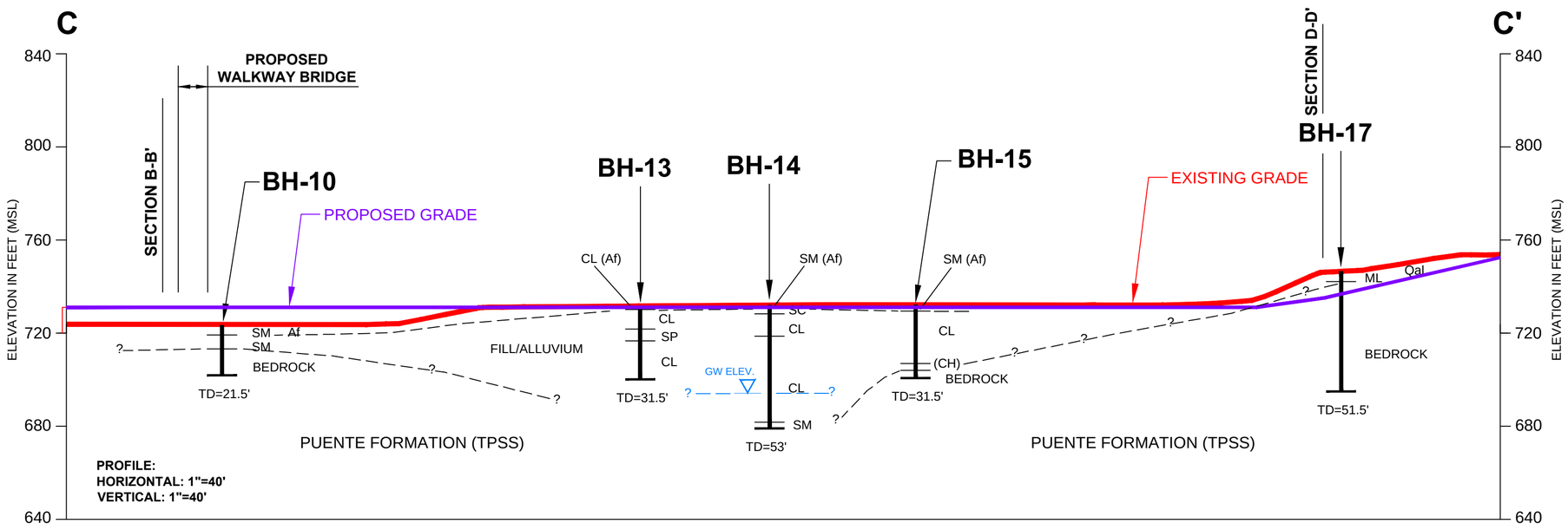
MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

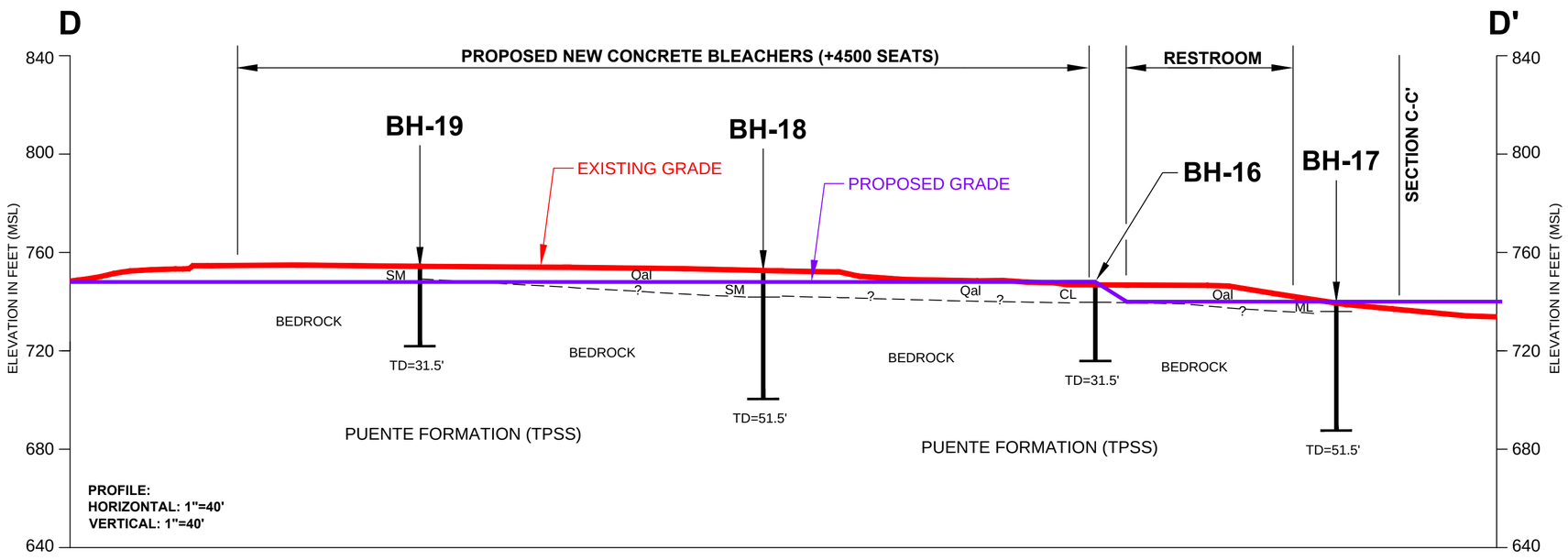
Scale: 1"=80'
Date: NOV. 2014
Project No.: 14-31-124-01
Drawing No.: 2

Converse Consultants









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CROSS SECTION A-A', B-B', C-C', D-D'

MT. SAN ANTONIO COLLEGE
ATHLETICS COMPLEX EAST
WALNUT, CALIFORNIA

Scale 1"=40'
Date AUG. 2014
Project No. 14-31-124-01
Drawing No. 4

Converse Consultants