Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

September 11, 2017

Project No. 11672.001

Mount San Antonio College
Facilities Building 46
1110 North Grand Avenue
Walnut, California 91789

Attention: Mr. Gary Gidcumb, Architect, LEED AP

Subject: **Geotechnical Review**
Mount San Antonio College South Campus-West Parcel
West of Grand Avenue and Approximately 500 Feet Southeast of Temple Avenue/Amar Road
City of Walnut, California

INTRODUCTION

Leighton Consulting, Inc. (Leighton) presents this geotechnical review of the preliminary review by the United Walnut Taxpayers (UWT, 2017) of the Converse Consultant's (Converse) Geotechnical Study Report (Converse, 2014); and Converse's "West Parcel – Landslide Toe Test Pit Trench Study, Mt. San Antonio College West Parcel Solar Project, 1100 North Grand Avenue, Walnut, California 91789, Converse Project No. 13-31-339-30", dated July 27, 2017. The Converse reports (2014 and 2017) were prepared for the proposed rough grading in the West Parcel of the South Campus of Mount San Antonio College in the City of Walnut, California. The site of the proposed development is located west of Grand Avenue approximately 500 feet southeast of Temple Avenue/Amar Road.

Converse conducted a subsurface investigation of the site for their 2014 Geotechnical Study Report and presented their findings, conclusions, and geotechnical recommendations as they relate to the rough grading design depicted in the preliminary site plan titled "Grand Avenue Parcel Earthwork, Exhibit D-5," dated November 4, 2013,

and a revised drawing annotated by Newcomb/Anderson/McCormick, dated January 7, 2014. We have been provided undated "South Campus Site Improvements – West" plans produced by Psomas, which include the proposed rough grading design. It is our understanding that the grading plan by Psomas is similar to the plan referenced in Converse's report and the plan referenced during UWT's review of Converse's report.

The United Walnut Taxpayers (UWT) reviewed Converse's 2014 Geotechnical Study Report and presented their preliminary review comments in a letter dated May 8, 2017. A summary of their review comments are presented below.

We performed a limited independent geotechnical and geologic study of the site relative to the design presented in Psomas' plan. We excavated one hollow stem boring in the canyon located in the northern portion of the site. Our subsurface exploration was planned to also include several large-diameter borings and test pit onsite, however, our site exploration was terminated before the large-diameter borings and test pits were excavated.

Converse excavated four exploratory test pits at the toe of an existing landslide (Test Pit Nos. 1 through 4), adjacent to Grand Avenue, in the West Parcel of the proposed South Campus solar project. Converse's purpose for the four test pits was to determine the depth and the lower extents of the existing landslide, and to observe the structure of the underlying intact bedrock. Leighton observed the conditions exposed in three of Converse's four test pits (Test Pit Nos. 2, 3, and 4).

Our geotechnical review of UTW's comments and Converse's 2017 Test Pit Trench Study was based on our limited subsurface data and findings from Converse's 2014 and 2017 reports. Our findings and conclusions presented below address some of the issues presented in the preliminary review by UWT. Considering this, our responses to the UWT review presented below are preliminary, and may change based on future geotechnical exploration or plan reviews.

LIMITED INDEPENDENT GEOTECHNICAL EXPLORATION BY LEIGHTON

1) Scope and Purpose

We were initially retained by Mount San Antonio College to conduct an independent geotechnical study considering the rough grading plan depicted in the referenced undated improvements plan by Psomas. However, our subsurface exploration was terminated before we excavated our proposed large-diameter borings and test pits.

Based on the tasks we were able to perform, our limited geotechnical exploration included:

- We reviewed of pertinent reports, maps, and aerial photographs including the 1974 Geologic-Seismic Study for the General Plan, City of Walnut (County of Los Angeles, 1974) as well as a subsurface investigation.

- We drilled, sampled, and logged one hollow-stem auger boring (LB-1) in the northern canyon onsite in a location near Grand Avenue, where the thickest amount of surficial soils in the entirety of the project site was anticipated. This hollow-stem auger boring was sampled and logged by a staff geologist under the field supervision of a Professional Geologist.

The initial purpose of our study was to investigate the site geologic and geotechnical conditions with respect to the proposed rough grading plan and provide preliminary geotechnical recommendations for the proposed improvements. Because we weren't able to complete our subsurface exploration, our limited study could not completely address the analysis of landslide and mass movements, analysis of the stability of proposed slopes including the design slope adjacent to the existing residences on Regal Canyon Drive, clarifying remedial removals and measures to mitigate landslide mass movements, and other geotechnical issues. Our hollow-stem-auger boring (LB-1) allowed us to evaluate liquefaction. The log for boring LB-1 is attached.

The scope of our limited subsurface exploration addresses some, but not all of the issues presented in UTW's review of Converse's 2014 study. Future geotechnical investigations should include observations of the geologic conditions of the site by a Professional Geologist and/or Certified Engineering Geologist. Future geotechnical investigations should also address all significant geotechnical issues relating to the design and construction of the site in order to adequately support the County of Los Angeles Building Code Section 111 statement.

2) <u>Preliminary Findings</u>

Plate II of the Geologic-Seismic Study for the General Plan for the City of Walnut (County of Los Angeles, 1974) indicates that portions of the site range from having low to high landslide potential. We conducted an aerial photograph review of the site and observed geomorphic expressions of a landslide in the central hill in photographs ranging in date from 1980 through 2016. We also observed the conditions of that landslide during a field reconnaissance. Converse Consultants excavated four test pits

at the toe of this landslide on June 9 and 12, 2017. We observed three (of four) of their test pits, which exposed landslide debris overlaying intact claystone, siltstone, and sandstone bedrock. Based on the observations made during Converse's test pits, the landslide debris appears to terminate downslope at the geomorphological toe of the landslide, and does not cross Grand Avenue. Future geotechnical studies of the site should include exploration through the middle portion of the landslide extending into the underlying bedrock. The observations made in these borings would indicate an estimate of the depth and the nature of the failure and provide data regarding the geologic conditions beneath the landslide. Understanding these elements would also indicate removal recommendations for the landslide debris and slope stability analysis of the proposed grading design in the area of the landslide.

We have also reviewed three published geologic maps that cover the project site (County of Los Angeles, 1974, Dibblee, 2002, and Shelton, 1965). All three maps indicated that bedding within and around the site dips towards the northeast, east-northeast, and north-northeast at angles ranging from approximately 20 to 30 degrees. Additionally, the test pits conducted by Converse at the toe of the landslide in the central hill exposed intact bedrock with bedding planes dipping towards the north and east-northeast at angles ranging from 12 to 32 degrees. Future geotechnical studies of the site should include work to develop a better understanding of the geologic structure onsite.

We logged and sampled a hollow-stem auger boring, LB-1, located in the northern canyon near Grand Avenue. In LB-1, we found approximately 40 feet of alluvium consisting of clayey and and silty sand with gravel, gravel with sand, and sand with gravel overlaying siltsone interbedded with sandstone. Groundwater in LB-1 was encountered at a depth of approximately 37 feet below the existing ground surface.

3) Slope Stability Analysis

Our current understanding of the geologic structure onsite suggests that bedding potentially dips north and northeast. This is an out-of-slope condition for the approximately 35-foot-tall, 2:1 gradient (horizontal:vertical) design cut slope beneath the existing residences along Regal Canyon Drive in the northwestern portion of the project site. Considering this, we have prepared a preliminary cross section representing that slope, but with what we believe are conservative assumptions (the design slope is a 60-foot-tall, 2:1 gradient cut constructed in predominantly interbedded claystone, sandstone, and siltstone dipping directly out-of-slope at an angles of 10 to 16 degrees). We assumed what we believe are representative to conservative along-bedding

strength parameters for the bedrock - a cohesion of 250 psf and an angle of internal friction of 10 degrees. Our preliminary slope stability analysis yielded a factor of safety of less than 1.5 with these parameters. To provide adequate stability for the analyzed slope, our preliminarhy analysis indicates that an approximately 40-foot-wide stability buttress founded in a 5-foot deep key would need to be constructed for the slope. This preliminary analysis was conducted only to check whether stabilization of the slope is feasible.

The conditions of all design slopes and any natural slopes with potential instability should be further evaluated in future geotechnical studies of the site. Slope stability analysis should be conducted for cut, fill, and natural slopes in order to adequately support the County of Los Angeles Building Code Section 111 statement.

The spatial extents and depths of the existing landslide should be modelled in future geotechnical studies of the site to evaluate the temporary stability of the excavation once landslide debris removal have been completed.

4) Liquefaction Analysis

The State of California has mapped a portion of this site to be in an area of liquefaction potential. Converse has analyzed the potential for liquefaction based on their boring BH-15. This boring was located in the southern canyon onsite, and was observed to have drilled through approximately 12 feet of alluvium with perched groundwater in the bedrock 16 feet below the surface. The northern canyon onsite was observed by Converse to contain alluvium greater than 21.5 feet deep, with groundwater 15.5 to 21.25 feet below the surface. These borings did not extend to bedrock, and Converse did not use data from the deeper northern canyon while performing liquefaction analysis.

Alluvium extended to a depth of approximately 40 feet below the existing ground surface in our boring LB-1, located in the middle of the northern canyon near Grand Avenue. The alluvium encountered consisted of clayey sand, silty sand with gravel, and gravel with sand, and was very dense at a depth of approximately 20 feet below the surface. Groundwater in our boring was encountered at a depth of approximately 37 feet below the ground surface.

We conducted liquefaction analysis based on the subsurface data from our boring LB-1 and considered the observations made by Converse in their borings BH-1, BH-2, and BH-7, which were all located in the northern canyon. We assumed alluvium to be 40

feet thick based on conditions observed in LB-1, and we assumed a highest historical groundwater of 16 below the ground surface based on the highest groundwater encountered in the site (Converse boring BH-2). The seismic parameters used for our liquefaction analysis were based on the results of the U.S. Geological Survey's U.S. Seismic Design Maps and Unified Hazard Tool online applications. For our liquefaction analysis, we used an adjusted Peak Horizontal Acceleration (PGA_M) of 0.77g and an earthquake magnitude of M_w=6.7.

Based on the assumptions described above, the conditions at boring LB-1 are considered non-liquefiable due to the dense soil below the assumed highest groundwater level.

We also have performed preliminary analyses to estimate the potential for seismically induced settlement using the method of Tokimatsu and Seed (1987), and based on Martin and Lew (1999), considering the maximum considered earthquake (MCE) peak ground acceleration (PGA_M). The preliminary results of our analyses suggest that the onsite soils are susceptible to approximately 0.9 inch of seismic settlement based in the MCE. These conditions are preliminarily considered suitable for the development.

5) Remedial Removals

Based on the conditions encountered in our boring LB-1, remedial removals extending to depths approaching 20 feet below the existing ground surface in the northern canyon should be recommended. Recommended depths of removals of the existing landslide in the central hill will be provided once a subsurface exploration through the landslide and subsequent analysis has been completed. Remedial removal recommendations considering differential settlement as well as collapse potential and the stability of existing slopes should be addressed in future geotechnical studies of the site. A geologic/ geotechnical map that includes approximate depths of remedial removals onsite should be included in future geotechnical studies of the site.

GEOTECHNICAL ISSUES PRESENTED IN THE UWT REVIEW OF CONVERSE'S 2014 STUDY

The UWT preliminary review of Converse's Geotechnical Study Report addresses several geotechnical or geologic issues related to the proposed rough grading. In general, the review identified the following issues:

- Lack of geologic and geotechnical data presented in Converse's report.
- Geologic conditions onsite were not observed by a Professional Geologist and/or Engineering Geologist for Converse's investigation.
- A landslide in the central portion of the site was not addressed in Converse's report.
- No slope stability analysis was included in Converse's report.
- Liquefaction analysis in Converse's report did not represent the most critical area of the site.
- The impact of the load of design fills was not addressed in Converse's report.
- Specific remedial removal recommendations were not presented in Converse's report

This letter addresses some of the issues identified in the UWT review as well as other significant geotechnical issues relating to the development of the South Campus-West Parcel site. We have attached an annotated copy of the UWT review indicating in which sections of the summary of our limited geotechnical exploration each UWT comment is addressed.

REVIEW OF CONVERSE'S 2014 WEST PARCEL -LANDSLIDE TOE TEST PIT TRENCH STUDY

Findings

Converse observed the basal plane of the landslide along the toe at elevations roughly similar to the elevations of Grand Avenue. Leighton also observed the basal plane of the landslide roughly at a similar elevation as Grand Avenue in Test Pit Nos. 2, 3, and 4. Above the landslide basal plane, landslide debris was observed to be loose, disturbed, and broken earth materials. Intact bedrock beneath the landslide basal plane consisted of siltstone, claystone, and sandstone dipping 14 to 30 degrees towards the northwest, north, and northeast.

Preliminary Conclusions

Converse concluded that the toe of the existing landslide is situated onsite just west of Grand Avenue. Based on our review of their findings and our limited observations onsite, the location of the toe of the landslide as described in Converse's Landslide Toe Test Pit Trench Study is reasonable.

Converse recommended that the existing landslide debris and slip plane should be completely removed during remedial grading of the project. Additionally, Converse recommended to construct the slope designed in the area of the existing landslide for the proposed solar project with a 25 to 40-foot-wide buttress founded 5 feet below the ground surface. Neither Converse's 2014 Geotechnical Study nor their 2017 Landslide Toe Test Pit Trench Study included slope stability analysis.

Preliminary Recommendations

Without slope stability analysis, Converse's recommendation for the construction of the design slope in the area of the existing landslide with a 25 to 40-foot-wide buttress founded 5 feet below the ground surface cannot be evaluated. Slope stability analysis should be conducted for cut, fill, and natural slopes in order to adequately support the County of Los Angeles Building Code Section 111 statement.

The spatial extents and depths of the existing landslide should be modelled to evaluate the temporary stability of the excavation of landslide debris removal. According to Los Angeles County specifications, the minimum factor of safety for temporary excavations is 1.25.

CLOSING

Our geotechnical review is based on limited data from our boring, limited observation of the surface of the site, the 2014 and 2017 reports by Converse, and our limited observations made during a portion of the fieldwork conducted by Converse for their Landslide Toe Test Pit Trench Study. Our findings, conclusions, and recommendations are preliminary in nature, and may change based on future geotechnical exploration or plan reviews.

We appreciate the opportunity to be of services to you. Should you have any questions, please do not hesitate to contact either of the undersigned.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Jason D. Hertzberg, GE 2711
Priicipal Engineer

SGO/JDH/rsm

Attachments: References
Annotated UWT Preliminary Review
Leighton Boring LB-1 Log
Converse Borings BH-1, BH-2, and BH-7 Logs

Distribution: (1) Addressee

Leighton

REFERENCES

California Geological Survey (CGS), 1999, State of California Seismic Hazard Zones, San Dimas Quadrangle, Official Map, Released: March 25, 1999, scale 1:24,000.

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Shelton, J.S., 1965, Glendora Volcanic Rocks, Los Angeles Basin, California, Bulletin of the Geological Society of America, vol. 66, pp.46-90, January 1965.

United Walnut Taxpayers (UTW), 2017, Preliminary Review of Negative Geotechnical and Geological Aspects of Constructing Earthfill Pad for a Solar Farm on the West Parcel – Draft, May 8, 2017.

ANNOTATED UNITED WALNUT TAXPAYERS PRELIMINARY REVIEW OF NEGATIVE GEOTECHNICAL AND GEOLOGICAL ASPECTS OF CONSTRUCTING EARTHFILL PAD FOR A SOLAR FARM ON THE WEST PARCEL - DRAFT

1. Introduction

A licensed Engineering Geologist has been retained by United Walnut Taxpayers (UWT) to review of the report from Converse Consultants, dated December 19, 2014, from a geotechnical perspective, and grading plans prepared by Psomas and submitted to the City of Walnut on January 24, 2017. The purpose of this work was to assess the general geological setting of the site, assess the hazards and issues related to placement of earthfill at the site in accordance with grading plans received, and determine if it is possible to develop a project in a safe manner suitable to support the proposed earthfill development and maintain the integrity of the surrounding properties. Licensed Civil Engineers from United Walnut Taxpayers are overseeing this work and have prepared this draft summary document.

2. Initial Summary of Preliminary Expert Opinion of Converse and Psomas Reports

a. Significant Deficiencies in Converse Subsurface Investigations, Analysis and Baseline Geologic Data

i. Conclusions are not well supported and there is no discussion and/or analysis of significant issues.

See Sections 1 through 5 in Leighton's geotechnical review.

Issues relating to settlement should be evaluated in future geotechnical studies of the site.

ii. Poorly supported conclusions could impact the stability and safety of the project site and the safety of adjacent offsite properties and homes.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review.

iii. Subsurface investigations did not provide for direct observation of geologic field conditions by a Professional Geologist and/or Engineering Geologist.

See Section 1 (Scope and Purpose) in Leighton's geotechnical review.

iv. Complex observations were performed by an Engineer-in-Training who is not trained or qualified to analyze geologic conditions and log field investigation borings.

See Section 1 (Scope and Purpose) in Leighton's geotechnical review.

v. Observations were based on the limited field sampling that was conducted. Data is lacking to create a geologic map and geologic cross-sections that illustrate the site geologic conditions.

See Section 1 (Scope and Purpose) in Leighton's geotechnical review.

vi. Insufficient surface and subsurface information is available from the Converse report to determine the earth materials that are present, and the geologic structure of the site.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

vii. The Converse report did not recognize a significant landslide in the central hill of the project site present for more than thirty years (see Google Earth attachment), which is vulnerable to further sliding.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

viii. Orientations of bedding planes at northwest portion of site were based on limited borings and are opposite to all relevant published geologic mapping.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

ix. Inconsistencies in bedding plane orientation reported by Converse versus published geologic mapping is not explained or reconciled.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

x. Converse concludes bedding planes near Regal Canyon Drive homes are oriented into the slope and stable, while all relevant, published geologic mapping shows bedding is oriented out of the slope and unstable to these homes and properties.

See Sections 2 (Preliminary Findings) and 3 (Slope Stability Analysis) in Leighton's geotechnical review.

xi. The project results in potential significant negative impacts to Grand Avenue, including effects of potential liquefaction and induced settlement from adjacent earthfill over alluvial materials if left in place.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review.

Issues relating to settlement should be evaluated in future geotechnical studies of the site.

xii. Poorly defined and inadequate removal of unsuitable soils proposed can result in earthfill and foundation instability of the project, including placement of earthfill over an active landslide.

See Sections 2 (Preliminary Findings), and 5 (Remedial Removals) in Leighton's geotechnical review.

Issues relating to settlement should be evaluated in future geotechnical studies of the site.

3. Review of the Geologic and Geotechnical Information

Several documents were reviewed in order to understand the geologic conditions underlying the site. The Converse report was based on subsurface exploration consisting of drilling, logging, and sampling various diameter borings in May 2014. Their investigation also included laboratory testing.

a. Partial Listing of Geologic and Engineering Documents Reviewed

i. Regional Geologic Map Generated by T.W. Dibblee (1989).
See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

ii. Geologic and Landslide Potential Maps (Plates I and II), generated by the Los Angeles County Engineer for the City of Walnut as part of their General Plan (1974).
See Section 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

iii. Converse Consultants, Geotechnical Study Report, Proposed Fill Placement at the West Parcel, December 19, 2014.

iv. Psomas, Undated, South Campus Site Improvements - West, Mount San Antonio College, Undated.

v. UWT Engineering Geologist expert knowledge of geologic formations present at the site.

c. Preliminary Findings of Relevant Geological Mapping Review of West Parcel - T.W. Dibblee (1989), LA County Engineer (1974) and UWT Engineering Geologist (2017)

i. The Dibblee Regional Geologic map (1989) indicates the site is underlain by bedrock of the Tertiary Sycamore Canyon Formation and that bedding is generally striking northwest southeast and dipping to the northeast. The surrounding areas are indicated as being underlain by the Tertiary Yorba member of the Monterey (Puente Formation) with similar bedding orientations.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

ii. The LA County Engineer, 1974, geologic map indicates, the site is underlain by bedrock of the Puente Formation. The central knob and adjacent hilltops are indicated as being underlain by sandstone and conglomerate, however, the lower portions of the hills are indicated as being underlain by the shales and siltstones.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

iii. UWT Engineering Geologist observations confirm findings of the LA County Engineer (1974) and T.W. Dibblee (1989) geologic mapping.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

iv. UWT Engineering Geologist observes bedding dip is generally east and sandstone and conglomerates are present. Where the shale and siltstone was observed, bedding dips to the east-northeast (similar to as indicated by T.W. Dibblee [1989]).

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

d. Converse Geological Investigation Does not Reveal Low Strength Silts and Shales and Presents Other Significant Omissions

i. Converse report indicates, *"the site is underlain by hard, cemented sandstone pebble conglomerate bedrock"*. There is no mention of the presence of siltstone and/or shales, indicative of lower strength materials, which could result in unstable conditions in overlying earthfill.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

ii. The low strength of numerous observed laminations and bedded siltstones are not emphasized as they affect the stability of the overlying earthfill.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

iii. There are few notations of earth materials encountered.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

iv. Geologic contacts between the differing geologic materials are not indicated and no structural information (such as bedding orientations) is provided.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

v. Site-specific geologic structural information is only discussed in the text as it relates to a single large-diameter bucket auger boring , indicating bedding that was generally dipping northwest

See Section 1 (Scope and Purpose) in Leighton's geotechnical review.

vi. The above cited northwest bedding dip by Converse is nearly opposite of the regional bedding orientations indicated on the T.W. Dibblee Regional Geology map (1989) and LA County Engineer geologic mapping (1974).

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

ix. Converse's observations from infrequent samples in the small diameter borings indicated bedding which had near horizontal to near vertical dips. These inconsistences are not presented or explained in the report.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

The above statements and observations by Converse could potentially lead to conclusions that bedding orientations are generally into the slope and westerly, suggesting hillsides and hillside cuts are stable. In fact, there is evidence that actual bedding orientations dip out of the slope, as represented on all relevant geologic maps and field observation by our Engineering Geologist, resulting in unstable conditions.

4. Need for Qualified Personnel to Perform Geologic Field Observations

i. Inadequacies of Converse Field Observation Personnel

i. A Geologist or Engineering Geologist should perform a geological study, including direct observations of geologic field conditions such that field conditions are not overlooked or misinterpreted.

See Section 1 (Scope and Purpose) in Leighton's geotechnical review.

ii. An Engineer-in-Training who is not trained to analyze geologic conditions logged borings and performed field observations.

See Section 1 (Scope and Purpose) in Leighton's geotechnical review.

iii. Field observations were based on the limited field sampling that was conducted.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review.

iv. Converse field personnel overlooked an obvious and significant landside that occurred on the central hill area of the site that by expert review of historical photographs took place several decades ago.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

v. Improper field observations can lead to conclusions affecting the safe installation the project, but also the safety of adjacent properties and residences.

See Sections 1 (Scope and Purpose), 2 (Preliminary Findings), and 3 (Slope Stability Analysis) in Leighton's geotechnical review.

The practical consequence of inadequate field observations is that up to seventy (70) feet of earthfill would be placed over unmitigated landslide rupture surfaces, typically exhibiting low strength and subject to further movement, adjacent to a highly-travel public road. As noted below, limited sampling in other areas compromised liquefaction analyses and the consequences of bedding plane orientations on adjacent properties and residents.

5. Landslides/Mass Movements

a. Deficient Landslide Analysis Overlooked a Significant Existing Landslide at Grand Avenue and Other Adverse Geologic Features

i. Government codes and guidelines require a discussion of the potential for landsliding at any hillside site in California.

See Sections 1 (Scope and Purpose), 2 (Preliminary Findings), and 3 (Slope Stability Analysis) in Leighton's geotechnical review.

ii. No landslide analyses of mass movements/landsliding were conducted by Converse nor were landslides shown on any of their maps, cross-sections or indicated in the text of the report.

See Sections 1 (Scope and Purpose), 2 (Preliminary Findings), and 3 (Slope Stability Analysis) in Leighton's geotechnical review.

iii. No discussion is provided in the report other than relating to seismically induced landslides, which by site evidence does not account for existing landsliding that has occurred along Grand Avenue more than thirty years ago after the four-lane road was established.

See Sections 1 (Scope and Purpose), 2 (Preliminary Findings), and 3 (Slope Stability Analysis) in Leighton's geotechnical review.

iv. Aerial imagery from Google Earth clearly indicates landslide(s) exists on the eastern side of the central knob descending down to Grand Avenue (see attachment). The landslide area on the central hill is present in aerial imagery dating from after 1980 until the present.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

v. The above referenced landslide is further validated through field visits to the site by our Engineering Geologist and former City officials with first-hand knowledge of at least two landslides that occurred at the subject site after Grand Avenue was expanded to four lanes.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

vi. At least one of the above landslides at the central hill of the site closed the road (Grand Ave.) and covered all the lanes. In addition, siltstone and shale bedrock with eastward dipping bedding subject to landsliding was observed in this area.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

vii. In addition to the landslide(s) discussed above, review of aerial imagery indicates other areas of the site, which may be underlain by landslides, or have the potential for landsliding.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

viii. Geologic cross-sections were not prepared to show landslide extent and no stability analyses were conducted to determine if earthfill slopes or cuts in natural slopes were feasible.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review.

ix. The Converse report did not reference the LA County Engineer Landslide Potential Map (1974) that indicates significant portions of the site have a High Landslide Potential (Plate II). Such a report is typical of city planning initiatives and is an obvious document to be sought out and reviewed.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review.

x. Essentially any of the east facing slopes that are underlain by thinly bedded (laminated) bedding has a potential for landsliding. There are also several geomorphic features of the site that may be indicative of landsliding, but not investigated and analyzed by Converse.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review.

The consequence of not identifying the landslide was that significant earthfill would have been placed over landslide rupture surfaces without any remedial measures, making it subject to future landsliding. The public safety consequences of a potential landslide on the highly traveled Grand Avenue are apparent.

6. Liquefaction

a. Abbreviated and Poorly Scoped Liquefaction Analysis Overlooked Liquefaction Potential Below the Proposed Earthfill and Near Grand Avenue

i. The Converse report identified portions of the site as having a potential for liquefaction according to the state of California (CGS, 1999).

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review.

ii. Several borings were excavated in these areas, but Converse conducted liquefaction analysis for only one of the borings.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

iii. This boring was located in the southern canyon area where the alluvial deposits were the shallowest, and analyses concluded that the site was not susceptible to liquefaction and significant seismic settlement.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

iv. Converse did not conduct liquefaction analysis for the northern canyon area where alluvium was deepest and more indicative of conditions subject to liquefaction.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

v. Two borings that were excavated closer to the northern canyon were terminated without encountering bedrock.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

vi. Groundwater was encountered in both these borings along with some loose alluvium typical of liquefiable materials. However, these boring were not analyzed for liquefaction potential.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

vii. None of the above borings were excavated along the axis of the canyon or at the lower end of the canyon where the alluvium would be the deepest, groundwater would potentially be the shallowest, the potential for liquefaction would be the greatest.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

viii. The total depth of alluvium was not modeled or investigated near Grand Avenue within this canyon.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

ix. No analyses were conducted to determine the total depth of alluvium and obtain subsurface information the full length of the canyon for a proper liquefaction evaluation.

See Section 4 (Liquefaction Analysis) in Leighton's geotechnical review

The groundwater observations, loose alluvial deposits encountered and deeper alluvium suggest susceptibility to liquefaction and potential instability in the overlying proposed earthfill and nearby Grand Avenue.

7. Slope Stability

a. Vital Slope Stability Analyses Were Omitted Throughout the Converse Document

i. Geotechnical reports generally require slope stability analyses for cut and fill slopes, including the highest fill slopes.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

ii. Most agencies require proposed cut slopes over about 10 feet in height to be analyzed for geologic conditions and to determine orientation of bedding or other weak features.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

ii. Out-of-slope bedding, as is the case at the West Parcel, requires specific analyses of these features.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

iii. No geologic cross sections or geologic interpretations were prepared. Regional bedding attitudes and bedding observed by our Engineering Geologist elsewhere at the site indicated a significant potential for weak siltstone bedding dipping out of the slope.

See Sections 1 (Scope and Purpose) and 3 (Slope Stability Analysis) in Leighton's geotechnical review

b. No Stability Analysis Was Conducted for Cut Slopes, Including Critical Cut Slope Near Homes at Regal Canyon Drive

i. There are several proposed slopes that lack sufficient geologic information to prepare a geologic cross-section and/or conduct slope stability analysis.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

iv. No stability analyses were conducted near homes at the northwest portion of the site, despite published adverse out of slope bedding recorded at the highest cut slope on the project.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

v. The slope of most concern is the cut slope described above, proposed in the northwest portion of the site up to 40 feet in height, and located directly behind several existing homes.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

vi. The report stated that the proposed cut slope would have neutral to favorable bedding attitudes due to the bedding observed in only one large diameter boring and very limited field sampling.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

vii. However, published geologic mapping by T.W. Dibblee (1989) and the LA County Engineer (1974) show near opposite and adverse bedding orientation out of the slope similar to other bedding orientations on the project.

See Sections 2 (Preliminary Findings) and 3 (Slope Stability Analysis) in Leighton's geotechnical review

viii. Converse provides no explanation of the above inconsistency.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review

ix. Two smaller borings in this area found siltstone with no apparent bedding. However, an Engineer-in-Training who is not trained to analyze geologic conditions logged these borings, and the observations were based on the limited sampling that was conducted.

See Sections 1 (Scope and Purpose) and 2 (Preliminary Findings) in Leighton's geotechnical review

x. The proposed high cut slope would potentially remove natural resisting forces to landsliding along these beddings planes and could represent a significant hazard to offsite properties and existing homes at this location along Regal Canyon Drive.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

c. Vulnerable Orientation of Easterly Dipping Bedding Planes are Not Highlighted in Converse Report

i. The landslide at the central hill along Grand Avenue likely took place along easterly out of slope bedding orientations.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review

ii. Necessary removals of loose alluvium or removals in areas with High Landslide Potential could concurrently remove hillside materials that provide resisting forces to landsliding.

See Sections 2 (Preliminary Findings) and 3 (Slope Stability Analysis) in Leighton's geotechnical review

iii. The above condition would likely apply to homes and properties on Regal Canyon Drive (to the west) and on Stonybrook Drive (to the east) since slopes near these

properties have essentially the same bedding orientation observed at the central hill.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

d. Existing Landslide at Grand Avenue Posing Risk to Earthfill Project Was Overlooked

i. The slope along Grand Avenue consists of variable cut, fill, and in some locations, fill over the existing slope.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

ii. The central portion of the Grand Avenue site is underlain by the landslide.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review

iii. The proposed cut slope in this area will most likely not remove all the landslide debris, and the underlying cause(s) of the landslide.

See Sections 3 (Slope Stability Analysis) and 6 (Remedial Removals) in Leighton's geotechnical review

iv. Additional landslide movement can potentially occur with the placement of overlying earthfill and without removing all landslide rupture surfaces.

See Sections 2 (Preliminary Findings) and 3 (Slope Stability Analysis) in Leighton's geotechnical review

v. The geologic conditions have not been modeled by Converse for the differing conditions along the length of this slope nor has the existence of the landslide been identified.

See Sections 2 (Preliminary Findings) and 3 (Slope Stability Analysis) in Leighton's geotechnical review

8. Remedial Removals and Measures to Mitigate Landslide Mass Movements

a. Project Description of Remedial Soil Removals is Poorly Defined

i. Converse report states that "loose, disturbed or unsuitable alluvial soils" is to be removed from the surface of the West Parcel site before placing earth fill.

ii. The above statement is difficult to interpret and is not well defined as to the precise depths and/or criteria for remedial soil removals on the project site. A definition of "loose and unsuitable soils" is also not provided within the report.

See Section 5 (Remedial Removals) in Leighton's geotechnical review

iii. Based on the alluvial deposits encountered in Converse borings, remedial soil removal would likely be at least 20 feet in depth.

See Section 5 (Remedial Removals) in Leighton's geotechnical review

iv. Removal of landslide materials are likely greater than 20 feet in depth and could at least double earthwork quantities for the project.

See Sections 2 (Preliminary Findings) and 6 (Remedial Removals) in Leighton's geotechnical review

b. Remedial Soil Removals May Result in Destabilizing Adjacent Natural Slopes

i. At the south end of the project, hillsides would be undercut by remedial soil removals and preparations for earthfill placement, and would potentially be destabilized because of out of slope bedding, along with adjacent properties and homes along Stonybrook Drive.

See Sections 3 (Slope Stability Analysis) and 5 (Remedial Removals) in Leighton's geotechnical review.

ii. UWT Engineering Geologist recommends that the extent of soft, yielding soils cited by Converse should be explicitly defined in order to address remedial removals.

See Section 5 (Remedial Removals) in Leighton's geotechnical review.

iii. Similar to the above soft, yielding soil conditions, the LA County Engineer Geologic and Landslide Potential Maps (1974) depict unsuitable soil and geologic conditions over a substantial portion of the site.

See Sections 2 (Preliminary Findings) and 5 (Remedial Removals) in Leighton's geotechnical review.

iv. The occurrence of an existing landslide at the site suggests potential for landslides with similar east facing slopes, underlain by thinly bedded (laminated) east-facing bedding.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review.

v. The need to remove unsuitable alluvial soils is demonstrated in areas with High Landslide Potential on the 1974 maps, which left unmitigated could lead to instability in proposed earthfill and foundation materials.

See Sections 2 (Preliminary Findings), 3 (Slope Stability Analysis), and 5 (Remedial Removals) in Leighton's geotechnical review.

c. Placement of Earthfill over Alluvium Poses Potential Risk of Settlement of Earthfill and Induced Settlement of Grand Avenue

i. Removal of alluvium along Grand Avenue, where the alluvium will be the thickest, has not been discussed and/or modeled.

See Section 3 (Slope Stability) in Leighton's geotechnical review.

ii. If alluvium is remaining adjacent/beneath Grand Avenue and additional filling is proposed over the alluvium, then there is potential that this proposed condition will result in settlement under the earthfill, as well as induce settlement beneath Grand Avenue.

See Section 5 (Remedial Removals) in Leighton's geotechnical review.

Issues relating to settlement should be evaluated in future geotechnical studies of the site.

iii. Potential induced settlement of Grand Avenue and the underlying major utilities that likely exist within the road prism may be a significant issue.

See Section 5 (Remedial Removals) in Leighton's geotechnical review.

Issues relating to settlement should be evaluated in future geotechnical studies of the site.

iv. The above potential settlement conditions were not discussed or analyzed in the Converse report, leaving significant settlement issues and consequences unaddressed.

Issues relating to settlement should be evaluated in future geotechnical studies of the site.

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d. Plan for Remedial Soil Removals Omitted from Plans

i. Remedial soil removals were discussed by Converse however, estimated depths of removal and the criteria to determine if removals are sufficient were not provided.

See Section 5 (Remedial Removals) in Leighton's geotechnical review.

ii. Remedial soil removal can affect many other issues including total and differential settlement, potential for collapse, and the stability of existing slopes.

See Sections 3(Slope Stability) and 5 (Remedial Removals) in Leighton's geotechnical review.

iii. A remedial measure map was omitted that would indicate all the recommended remediation necessary for safely grading the site.

See Section 5 (Remedial Removals) in Leighton's geotechnical review.

iv. Lacking clear definition of remedial removals, the integrity of the underlying foundation materials and proposed overlying earthfill cannot be determined, and remedial removals when defined can become a significant cost issue.

See Section 5 (Remedial Removals) in Leighton's geotechnical review.

e. Potential for Similar Landsliding from Slope Undercutting and Adverse Bedding Orientations Exists at Central Hill and Near Regal Canyon Drive

i. The landslide at Grand Avenue occurred about 1980 shortly after Grand Avenue was widened to four lanes in the late 1970's, likely from the undercutting of the central hill near the roadway.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review

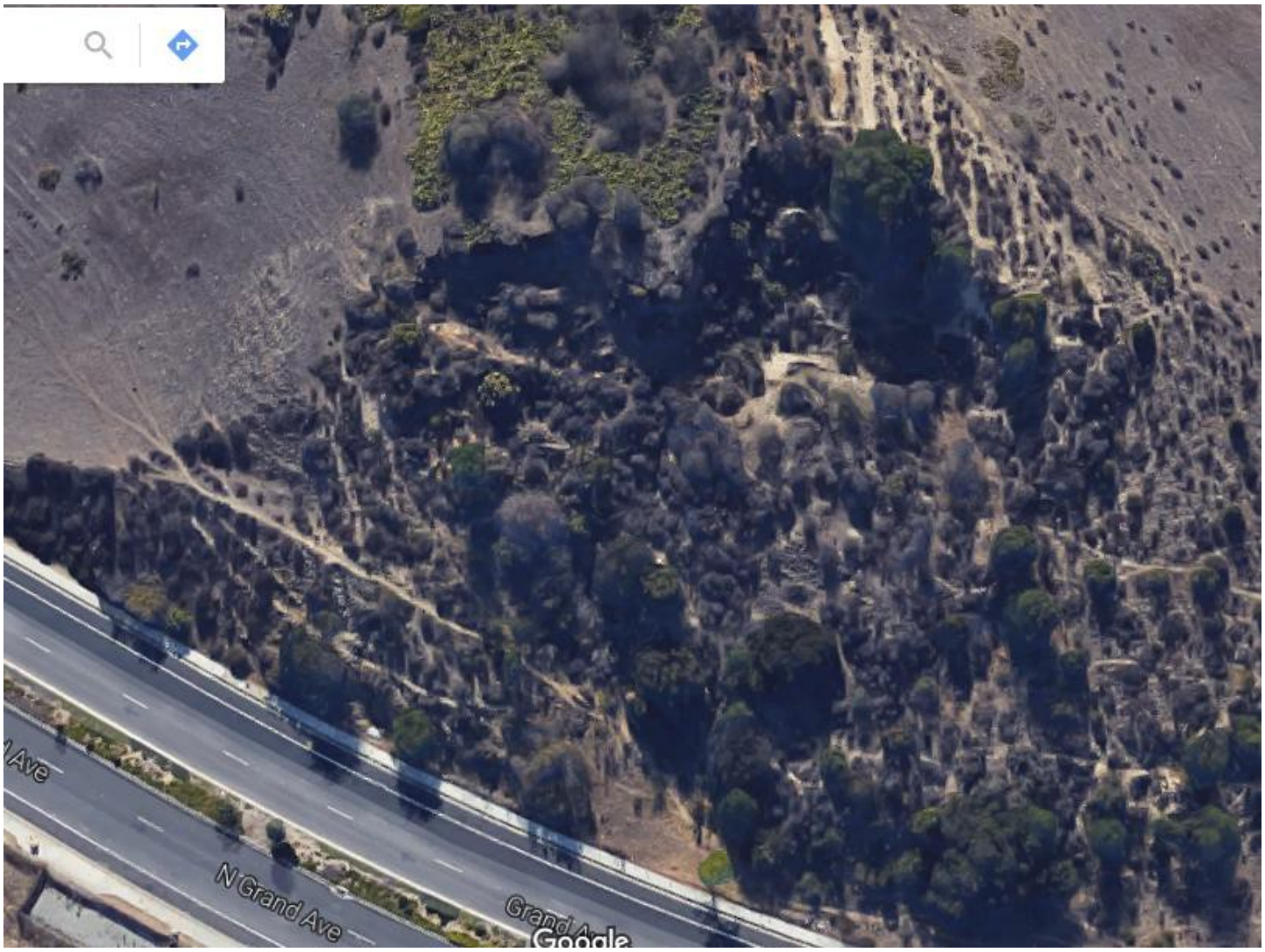
ii. Homes on Regal Canyon Drive were built between 1980 and 1995, separated by about 0.15 miles from the central hill by an intervening canyon.

See Section 2 (Preliminary Findings) in Leighton's geotechnical review

iii. The proposed project grading would undercut hillside slopes north of these homes by up to 40 feet, potentially causing similar landsliding along out of slope bedding planes.

See Section 3 (Slope Stability Analysis) in Leighton's geotechnical review

Attachment
Google Earth Image of Existing Landslide at West Parcel Site



GEOTECHNICAL BORING LOG LB-1

Project No.	11672.001	**Date Drilled**	6-12-17
Project	Mt. SAC South Campus Improvements - West Parcel	**Logged By**	BER
Drilling Co.	2R Drilling	**Hole Diameter**	8""
Drilling Method	Hollow Stem Auger - 140 lbs.lb - Autohammer - 12" Drop	**Ground Elevation**	729'
Location		**Sampled By**	BER

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1/B-2					**Alluvium (Qal)**	
725				R-1	5 7 7	113	8		CLAYEY SAND with gravel (SC), medium dense, dark reddish brown, wet, coarse sand, gravel approximately 0.5" to 1.0" in dimension.	M&D, PP
	5			R-2	5 6 7	123	12		CLAYEY SAND with gravel (SC), medium dense, dark reddish brown, very moist, coarse sand, gravel approximately 0.5" to 1.0" in dimension.	M&D, PP
720										
	10			R-3	7 9 14	121	9		CLAYEY SAND with gravel (SC), medium dense, reddish brown, moist, coarse sand, gravel approximately 0.5" in dimension.	M&D, PP
715										
	15			R-4	10 15 20	122	13		SILTY SAND / CLAYEY SAND with gravel (SM-SC), dense, brown, moist, medium sand, gravel approximately 1.5" in dimension.	M&D, PP
710										
	20			S-5	50/6"				GRAVEL with sand (GP), very dense, brown, slightly moist, medium to coarse sand, gravel approximately 0.75" in dimension.	
705										
	25			R-6	50/4"	106	13		SAND with gravel (SP), very dense, brown, slightly moist, medium to coarse sand, gravel approximately 0.75" to 1.0" in dimension.	M&D, PP
700										
	30									

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

SAMPLE TYPES:

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

TYPE OF TESTS:

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

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

GEOTECHNICAL BORING LOG LB-1

Project No.	11672.001	**Date Drilled**	6-12-17
Project	Mt. SAC South Campus Improvements - West Parcel	**Logged By**	BER
Drilling Co.	2R Drilling	**Hole Diameter**	8""
Drilling Method	Hollow Stem Auger - 140 lbs.lb - Autohammer - 12" Drop	**Ground Elevation**	729'
Location		**Sampled By**	BER

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	30			S-7	50/5"				SILTY SAND with gravel (SM), very dense, brown, moist, coarse sand, gravel approximately 0.75" in dimension.	
695										
	35			R-8	50/2"	113	18		SAND with gravel (SP), very dense, brown, wet, coarse sand, gravel approximately 0.5" in dimension.	M&D, PP
									Groundwater encountered at 36'11"	
690										
	40			S-9	50/3"	121	16		**Puente Formation, Sycamore Canyon Member (Tscs)** SILTSTONE, very dense, gray, moist, Interbedded with sandstone	M&D
685										
	45			R-10	50/3.5"					PP
									Total Depth = 45'3" Groundwater encountered at 36'11" Backfilled with soil cuttings	
680										
	50									
675										
	55									
670										
	60									

SAMPLE TYPES:

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

TYPE OF TESTS:

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

Log of Boring No. BH- 1

Dates Drilled: 5/6/2014 Logged by: MM Checked By: WHC

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

Ground Surface Elevation (ft): 734 Depth to Water (ft): 19.25

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)	TEST
		ALLUVIUM (Qa): **SILTY SAND (SM):** fine to medium-grained, some clay, with gravels up to 1.5" in maximum dimension, brown.						ei
5		-with cobbles			16/19/14	8	99	c
10		-with clay			5/5/6			
15		**GRAVELLY SAND (SP):** medium to coarse-grained, some silt, brown.			14/12/15	26	103	
20					12/9/12			
		End of boring at 21.5 feet. Groundwater encountered at 19.25 feet. Borehole backfilled with soil cuttings on 5-6-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
WEST PARCEL
WALNUT, CALIFORNIA

Project No. 13-31-339-01

Drawing No. A-2

Log of Boring No. BH- 2

Dates Drilled: 5/6/2014 Logged by: MM Checked By: WHC

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

Ground Surface Elevation (ft): 734 Depth to Water (ft): 15.5

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)	TEST
		ALLUVIUM (Qa): **SILTY SAND (SM):** fine to medium-grained, some clay, with gravels up to 1.5" in maximum dimension, dark brown.						
5		-brown	■		15/14/13	9	98	
10		**GRAVELLY SAND (SP):** medium to coarse-grained, gravels up to 2" in maximum dimension, trace silts, few cobbles, brown.	■		11/13/15	13	105	
15			☒		17/15/12			
20		-with cobbles	■		50(3")	16	107	
		End of boring at 21.5 feet. Groundwater encountered at 15.5 feet. Borehole backfilled with soil cuttings on 5-6-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
WEST PARCEL
WALNUT, CALIFORNIA

Project No. 13-31-339-01

Drawing No. A-3

Log of Boring No. BH- 7

Dates Drilled: 5/6/2014 Logged by: MM Checked By: WHC

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

Ground Surface Elevation (ft): 744.5 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)	TEST
		ALLUVIUM (Qa): **SILTY SAND (SM):** fine to medium-grained, some clay, few gravels up to 1.5" in maximum dimension, brown.						r
5			■		10/11/14	8	103	
10		**BEDROCK - PUENTE FORMATION (Tscs):** **SANDSTONE, SILTSTONE:** weathered, no apparent bedding, with gravels up to 2.5" in maximum dimension, few cobbles, orangish brown.	■		13/33/50(4")	6	115	
15			⊠		27/48/50(5")			
20			■		50(5")	8	112	
		End of boring at 21.5 feet. No groundwater encountered. Borehole backfilled with soil cuttings on 5-5-14.						

Converse Consultants

Project Name
MT. SAN ANTONIO COLLEGE
WEST PARCEL
WALNUT, CALIFORNIA

Project No. 13-31-339-01

Drawing No. A-8