



Converse Consultants

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

September 25, 2017

Ms. Rebecca Mitchell
Mt. San Antonio College
Facilities Planning & Management
1100 North Grand Avenue
Walnut, California 91789-5611

Subject: **RESPONSE TO TERRESTRIAL SOLUTIONS INC. (TSI) DRAFT ENVIRONMENTAL IMPACT REPORT REVIEW COMMENTS - GEOTECHNICAL REVIEW OF PROPOSED GRADING OF THE WEST PARCEL SITE DATED JUNE 29, 2017**
Mt. San Antonio College West Parcel Solar Project
1100 North Grand Avenue
Walnut, California 91789
Converse Project No. 13-31-339-30

References: Converse Consultants, Geotechnical Study Report, Proposed Fill Placement at the West Parcel, Mount San Antonio College, Walnut, California, dated December 19, 2014, Converse Project No. 13-31-339-01.

Converse Consultants, West Parcel-Landslide Toe Test Pit Trench Study, Mt. San Antonio College West Parcel Solar Project, 1100 North Grand Avenue, Walnut, California, dated July 27, 2017, Converse Project No. 13-31-339-01.

Terrestrial Solutions Inc., Geotechnical Review of Proposed Grading of the West Parcel Site for Mount San Antonio College, Walnut, California, dated June 29, 2017, TSI Project No. 17-088.

Dear Ms. Mitchell,

INTRODUCTION

Converse Consultants (Converse) presents this response to review comments received from the United Walnut Taxpayers (UWT) and their geologic consultant Terrestrial Solutions Inc. (TSI) Draft Environmental Impact Report (DEIR) review comments concerning geotechnical review of proposed grading of the West Parcel Solar Project site at Mt. San Antonio College in Walnut, California. This response report provides additional information for the Draft Environmental Impact Report (DEIR).

The field exploration work to further evaluate the road cut landslide and project site was stopped on June 12, 2017 due to reported concerns for the California Gnatcatcher habitat areas and breeding season. The West Parcel site field investigation work was stopped and was not completed pending further environmental evaluation of the Gnatcatcher habitat areas. Additional geotechnical studies, recommendations and reports are planned for the landslide repair and project site including slope stability analyses, temporary and permanent cut slope evaluations, keyway designs, subdrain system designs, geosynthetic reinforcements, buttress fills, slope stabilization fills, remedial removals and site grading.

The June 29, 2017 Terrestrial Solutions Inc. review report includes 12 pages of text, 7 figures and 2 pages of photographs. The Converse responses are directed to Section 3.0 of the TSI report entitled "Deficiencies and Consequences" presented on pages 9, 10 and 11 of the report.

RESPONSE TO REVIEW COMMENTS

TSI Comment: "Geologic Model – Insufficient surface and subsurface information is available to determine/model the earth materials that are present, and the geologic structure throughout the site."

Converse Response: The December 19, 2014 Geotechnical Study Report prepared by Converse Consultants presented the findings of 22 exploratory borings drilled, logged and sampled on the West Parcel site. The boring logs are presented in Appendix A of the report, titled Field Exploration. Nineteen (19) of the 22 exploratory borings encountered the various bedrock types on site including sandstone, conglomerate, siltstone and claystone bedrock materials. Two (2) of the borings (BH-1 and BH-2) were drilled to 21.5 feet below ground surface and did not encounter bedrock, only alluvium. Boring BH-13 did not encounter siltstone bedrock. The various soil and sedimentary bedrock types are identified on the boring logs based on material classifications and depths encountered. Geologic contacts between the differing geologic materials are shown on the borings logs. Sampling blow counts for each sample taken in the bedrock materials are presented on the boring logs.

The Geologic Map of the San Dimas and Ontario Quadrangles by Thomas Dibblee, Jr., DF-91, dated 2002, and other published maps do not show bedding attitudes on the West Parcel site. Bedding attitudes are shown on off-site areas some distance from the project site and do not represent the West Parcel site bedding attitudes and geologic structure. The bedding attitudes presented by Converse are based on direct field measurements performed on the West Parcel site. The bedding attitudes were measured on undisturbed bedrock materials located on the project site. Additional bedding attitudes have been measured around the perimeter of the Road Cut Landslide and in four (4) exploratory test pits excavated along the toe of the landslide

along Grand Avenue. These bedding attitudes are similar to the previously measured bedding attitudes and bedrock structure.

No evidence of faulting was found on the West Parcel site. Published maps by the California Geologic Survey (CGS) and Thomas Dibblee, Jr. do not show or mention faults on or near the West Parcel site. No evidence of faulting was found on the project site during the field investigation.

Sampling blow counts for each sample taken in the 22 exploratory borings in the soil and bedrock materials were presented on the boring logs. The strength of the soil and bedrock materials varied depending on several factors, including material type, rock type, degree of weathering and depth of burial. The deeper alluvium and bedrock materials provided high Ring sampler and Standard Penetration Test (SPT) blow counts and refusals to sampler penetration. The underlying alluvium and sedimentary bedrock materials will provide suitable support for the proposed fill soils and solar pad as it does throughout the local site area for residential hillside homes, highways, roads, businesses and colleges.

The proposed grading of the West Parcel Solar Project will improve overall site stability by placing engineered compacted fills in the low-lying canyon areas and lowering the hilltop slopes. The grading of the West Parcel Solar Project will remove the areas of "Low Landslide Potential", "Medium Landslide Potential" and "High Landslide Potential" as shown on the 1974 County Engineer Landslide Potential Map - Plate II, during grading and then become an "Urbanized Zone" classification with the landslide potential removed during proposed grading for the West Parcel project. As stated in the 1974 County Engineers Report, *"modifications to the topography by grading would greatly affect landslide potential. For example, subdivisions graded under present engineering geologic technology would become areas of low landslide potential and therefore could be zoned as "Urbanized: Landslide Potential Removed During Grading"*.

TSI Comment: "A discussion of existing, and potential landslides at the site including mitigation was not presented in the Converse report."

Converse Response: The unstable Road Cut Landslide was recognized on the central hillside above Grand Avenue on the project site. The Road Cut landslide occurred in the late 1970's as the result of previous grading activities by others to widen Grand Avenue. No slope drainage control devices (brow ditches, terrace drains, down drains, catch basins, etc.) were constructed on the hillside cut slope to control surface runoff. Multiple landslide failures were reported to have occurred on the road cut slope. The landslides were likely triggered by three (3) years of above normal rainfall between 1977 and 1980. The landslide was not repaired, but left to gradually increase in size during the past 38 years resulting in significant damage to the West Parcel property and posing a continued threat of slope instability and sudden ground movement to Grand Avenue.

The proposed grading for the West Parcel Solar Project will completely remove the unstable landslide deposits and replace them with engineered compacted fills that are keyed and benched into the underlying undisturbed bedrock materials. The proposed grading will remove and lower the hillside with the Road Cut Landslide down approximately 54 feet to an approximate elevation of 761 feet. The remaining landslide materials will then be completely removed down to undisturbed bedrock. The size, width and depth of the keyways and slope benches will be increased as needed during grading to remove all the disturbed landslide deposits and support the new engineered compacted fill soils on undisturbed bedrock materials. The new engineered compacted fills will be keyed and benched into the underlying undisturbed bedrock materials during grading of the West Parcel Solar Project.

Hillside slope areas in the environmentally sensitive habitat areas of the West Parcel site were not investigated. No grading is planned for these areas. The environmental habitat areas will be kept in their natural conditions.

Additional geotechnical studies, recommendations, and reports are planned for the Road Cut Landslide and West Parcel site including slope stability analyses, temporary and permanent cut slope evaluations, keyway designs, subdrain system designs, geosynthetic reinforcements, buttress fills, slope stabilization fills, remedial removals and site grading.

TSI Comment: “General slope stability modelling and discussion was not provided, especially regarding the slope along Grand Avenue, the proposed cut slope below the existing homes, and the natural slopes of the project.”

Converse Response: Field exploration work to further evaluate the Road Cut Landslide and West Parcel site was stopped on June 12, 2017 due to reported concerns for the California Gnatcatcher habitat areas and breeding season. The West Parcel site field investigation work was stopped and was not completed pending further environmental evaluation of the Gnatcatcher habitat areas. Additional geotechnical studies, recommendations, and reports are planned for the landslide repair and project site including slope stability analyses, temporary and permanent cut slope evaluations, keyway designs, subdrain system designs, geosynthetic reinforcements, buttress fills, slope stabilization fills, remedial removals and site grading.

TSI Comment: “Liquefaction was only discussed in relation to the southern canyon area and one boring within this canyon. The northern canyon is larger and has deeper alluvium than the southern canyon leaving significant deficiencies in the liquefaction analysis.”

Converse Response: An additional soil boring was drilled by Leighton Consulting on June 12, 2017 to further evaluate the potential liquefaction hazard in the northern alluvial filled canyon near Grand Avenue. Leighton performed a limited independent geotechnical and geologic study of the site relative to the proposed designs presented

in Psomas' current plan. Preliminary results of the soil boring were presented in Leighton's September 11, 2017 Draft Geotechnical Review. Subsurface exploration was planned to also include several large-diameter borings and test pits on site, however, the site exploration was stopped on June 12, 2017 due to reported concerns for the California Gnatcatcher habitat areas and breeding season.

Leighton logged and sampled an 8-inch diameter hollow stem auger boring, LB-1, located in the northern canyon near Grand Avenue. Boring LB-1 was drilled to a depth of approximately 45 feet below ground surface and reported to have encountered approximately 40 feet of alluvium consisting of clayey and silty sand with gravel, gravel with sand, and sand with gravel overlaying sedimentary bedrock consisting of siltstone interbedded with sandstone. The Standard Penetration Tests (SPT) met sampling refusal at all the sample depth intervals below 20 feet indicating very dense alluvial soil materials. Groundwater was encountered at a depth of approximately 37 feet below the existing ground surface.

Leighton conducted liquefaction analysis on Boring LB-1 based on the subsurface data encountered in the boring and considered the observations made by Converse in Borings BH-1, BH-2, and BH-7, which were all located in the northern canyon. Leighton assumed alluvium to be 40 feet thick based on conditions observed in Boring LB-1, and assumed the highest historical groundwater of 16 feet below ground surface as encountered in Converse Boring BH-2. The seismic parameters used for the Leighton 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. The Leighton liquefaction analysis used a Peak Horizontal Acceleration (PGAm) of 0.77g and an earthquake magnitude of Mw-6.7.

Leighton concluded, based on the assumptions described above, the soil conditions at Boring LB-1 are considered non-liquefiable due to the dense soil conditions below the assumed highest groundwater level. Leighton also performed 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 (PGAm). The results of the analyses suggest that the onsite soils are susceptible to approximately 0.9-inch of seismic settlement based on the MCE. These conditions are reported by Leighton to be suitable for site development.

TSI Comment: "Remedial removals were discussed however, estimated depths of removal and the criteria to determine when removals are sufficient were not provided."

Converse Response: Additional geotechnical studies, recommendations and reports are planned for the landslide repair and project site that will include depths of remedial removals for the canyon areas. Loose, disturbed or unsuitable alluvial soils encountered in the drainage canyons shall be removed to firm natural soils and/or

bedrock and then replaced as engineered compacted fill. Loose and unsuitable alluvial soils shall be cleaned out of the canyon bottoms prior to the placement of compacted fills and canyon bottom subdrains.

Four (4) exploratory test pit trenches were excavated along the toe of the Road Cut Landslide on June 9 and June 12, 2017. The purpose of the four (4) exploratory test pit trenches was to determine the depth and extent of landslide deposits along the toe of the landslide along Grand Avenue. The exploratory test pit trenches were excavated with a large Kobelco SK210-9 track-mounted excavator. The bedrock exposed in the bottom of Test Pit Nos. 1 through 3 encountered hard intact bedrock materials beneath the disturbed landslide materials. The excavator had to scrape and chip the bedrock exposed at the bottom of the trench during excavation. The trench sidewalls and bottoms were then cleaned off by hand to obtain bedding attitudes. The undisturbed bedrock exposures in the bottom of the trenches were hard and intact when struck by a geologic hammer. There was no evidence observed in the bottom of the trenches to indicate that additional slip planes existed below the bottom depths of the trench excavations. The bedrock exposed in the bottom of the trenches was undisturbed, hard and intact.

There has been no observed evidence of ground movement or displacement observed along the sidewalk and street surface on the west side of Grand Avenue below the road cut landslide.

The depths of the keyways along Grand Avenue for the landslide repair are anticipated to range from 5 to 15 feet below the Grand Avenue sidewalk grades. The excavations for the keyways will be safely set back from the sidewalk, street and buried utility lines for lateral support. The keyway bottoms will be leveled, stepped and back tilted for improved buttress stability. The deepest excavations for the keyways will be made along the back-cut slopes of the keyway and for the subdrain systems that will be safely set back from the sidewalk and street along the west side of Grand Avenue.

TSI Comment: “Remedial removal depths can affect many other issues including total and differential settlement, potential collapse, and the stability of existing slopes.

Converse Response: Additional geotechnical studies, recommendations and reports are planned for the landslide repair and project site that will include depths of remedial removals for the canyon areas, slopes and landslide area. Loose, disturbed or unsuitable alluvial soils and bedrock materials encountered in the canyons or on the slopes shall be removed to firm and unyielding natural soils and/or bedrock and then replaced as engineered compacted fill. Loose and unsuitable alluvial soil and bedrock materials shall be cleaned out of the canyon bottoms prior to placement of compacted fills and canyon bottom subdrains. Bedrock cut pad areas will be over-excavated and recompacted.

Grading will be performed in accordance with current grading codes. Grading observations and monitoring will be performed during project grading to verify that suitable bottom materials are reached and the compacted fills are placed in accordance with project plans and specifications and applicable grading codes. These mitigation measures will reduce the potential for differential settlement, potential collapse and instability to negligible and/or acceptable levels.

Sincerely,

CONVERSE CONSULTANTS



Mark B. Schluter, PG, CEG, CHG
Senior Engineering Geologist



Dist: 1/Addressee via Email