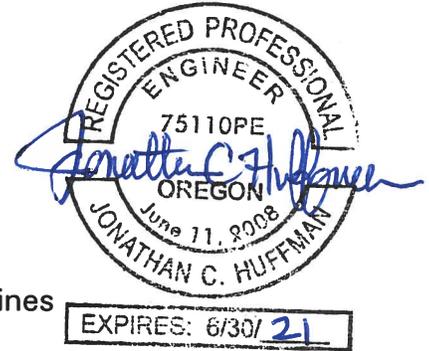




Foundation Engineering, Inc.

Professional Geotechnical Services

Date: August 5, 2019
To: Nicholas Amann, P.E.
Springfield Utility Board
From: Jon Huffman, P.E., G.E.
Subject: Response to Geoscience Report
Project: SUB Glenwood Substation and Transmission Lines
Project 2181086-102



This memorandum provides response to the Geoscience, Inc. report dated July 30, 2019 and titled *Re: Slope Stability Concerns, SUB Power Line, Vicinity of E 22ND Avenue.*

BACKGROUND

The Springfield Utility Board (SUB) is planning to construct a new substation on an undeveloped parcel near the east terminus of E. 22nd Avenue. SUB also plans to install new transmission lines that will connect the substation to existing lines located approximately one-half mile southeast of the substation on a parcel owned by the Eugene Water & Electric Board (EWEB). The transmission lines will cross multiple adjacent properties owned by SUB or EWEB. Poles used to support the transmission lines will be embedded at various locations. An improved gravel-surfaced road that primarily follows the alignment of an existing unpaved road will provide access to the transmission line poles.

SUB retained Foundation Engineering, Inc. as the geotechnical consultant. We completed three reports and/or technical memoranda to provide site evaluation and design support for the proposed facility. The reports are as follows:

- SUB Glenwood Substation – Geotechnical Investigation and Seismic Hazard Study (September 19, 2018)
- Slope Stability Review in Tree Felling Areas (December 27, 2018)
- Geotechnical Investigation for Transmission Line Pole Structures (July 24, 2019)

We understand each of these reports have been submitted as part of the design and approval process.

The planned facility has been appealed. The appellant submitted a report prepared by Geoscience, Inc. (Geoscience) that provides a review of available documents, summarizes observations from site visits, and discusses potential slope stability concerns. We reviewed the Geoscience report and provide the following commentary.

SUMMARY OF GEOSCIENCE REPORT

The Geoscience report includes a review of published geologic maps (e.g., Madin and Murray, 2005) and soil survey data, a 1936 aerial photograph, LiDAR imaging, and DOGAMI hazard publications. The report also summarizes observations made from site visits on July 15 and 28, 2019. No new subsurface explorations were completed as part of the Geoscience study.

Based on the data review and site visits, the report concludes there is a “probable landside feature”. It is described as a “amphitheater-shaped geomorphic feature in the southern part of the proposed project site”. The report indicates there would be “probable slope movement on the Interstate Highway” and recommends additional explorations near the presumed headscarp of this feature. It also recommends examination of the cut bank adjacent to the railroad that forms the approximate northeast boundary, and the valley floor east of the railroad (i.e., east of the project site). The Geoscience report also brings up concerns regarding the substation site because of the “placement of substantial fill”.

The timing of the Geoscience site visits, and subsequent report, were such that the author did not have access to Foundation Engineering’s latest report (dated July 24, 2019), which included new subsurface explorations across the SUB properties where the transmission lines will cross. We expect, several of the discrepancies noted herein between the Geoscience findings and those in our reports may be attributed to this.

DISCUSSION OF FINDINGS AND REVIEW

We reviewed most of the same publications identified in the Geoscience report, along with other relevant documents. We visited the project site several times to observe surface features. We also completed a series of subsurface explorations (i.e., borings and test pits) to identify soil and bedrock conditions. That work and the subsequent findings are summarized in the Foundation Engineering reports listed above. Discussion of the transmission lines and tree felling area and the substation site are addressed separately below.

Transmission Lines and Tree Felling Area

The Geoscience report indicates a “probable landslide feature” that could affect the interstate highway (I-5) to the south and west of the subject property, and the railroad to the east. However, it is important to reiterate that, while landslide features have been documented elsewhere in the hillside areas near the site, current hazard publications do not identify any landslide features within the property (e.g., scarps, landslide deposits, fan deposits, and/or colluvium).

Many landslide hazards cannot be identified prior to a slide occurring. However, Foundation Engineering recently completed explorations in the vicinity of the area that Geoscience identifies as a landslide feature. Those explorations did not encounter soil layers to indicate potential slide planes or similar landslide risks. Instead, our explorations typically encountered stiff to hard residual soil and weathered bedrock comprised of siltstone, sandstone, or mudstone. We encountered soft soil conditions

in only one exploration, which was located away from sloping ground and away from the area identified by Geoscience as the “probable slide feature”. The exploration logs and boring and test pit locations are provided in the Foundation Engineering report dated July 24, 2019.

In addition to the subsurface conditions identified in our recent explorations, it is also important to note the absence of any on-going movement in the developed areas adjacent to the project site. Along the southwest boundary, we expect deep-seated slope movement adjacent to I-5 would manifest itself in the form of damage to the freeway pavement (e.g., longitudinal cracks). Along the northeast boundary, excavations to construct the historic railroad have not caused instability beyond minor raveling along the cut face west of the rail lines. Such raveling is common in weak sandstone and siltstone and not indicative of deep-seated movement. Based on these observations and the noted soil and bedrock conditions in the explorations, we have not found evidence of active or impending landslide hazards.

The Geoscience report recommends evaluating the alluvial plane (i.e., valley floor) east of the “amphitheater-shaped landform” for geologic evidence of past debris flows. This area is outside the project boundaries. However, Foundation Engineering previously completed investigations for Wildish for an industrial park that was not developed. Details of the investigation are proprietary to the property owner and would not have been available for review by Geoscience. However, we can note the area adjacent to the railroad was previously used for mining river gravel between approximately the early 1950’s through 1970’s and was backfilled in the early 1980’s. The mining work is evident in aerial photos taken during those times. The area is presently underlain by several feet of fill followed by alluvial gravel or Eugene Formation bedrock. The presence of any debris flow prior to mining operations cannot be ascertained. However, we note the following two observations:

- 1) Because alluvial gravel was mined at this location, it suggests the gravel was encountered at shallow depths and less likely there were deposits of debris flow soils.
- 2) The deep excavation for mining gravel extended greater than 20 feet deep in some areas and did not trigger any slope movement on the adjacent property that SUB now owns. This suggests stable slopes within and adjacent to the SUB property.

Substation Site

The Geoscience report indicates “substantial fill” placed in the substation area could cause slope instability. We are unsure of the nature of this claim since the area is away from steep slopes and most of the site grading will be limited to cuts or fills on the order of a few feet. The area of deepest fill (± 6 to 7 feet) is located near the northeast corner of the substation site. However, this area is limited in extent and not adjacent to a steep slope. Therefore, slope stability is not a concern.

SUMMARY AND CONCLUSIONS

Our previous report to evaluate slope stability in the tree felling areas (dated December 27, 2018) acknowledges inherent risk associated with any development in hillside terrain. However, based on the published hazard data, site observations, and recent subsurface explorations, we do not believe there is an elevated risk at this site relative to other locations in the area.

Construction of the transmission line poles will be limited to isolated areas and not require mass grading that would alter the stability of the slopes. Furthermore, the poles will be installed in relatively flat or gently sloping terrain. We understand the tree felling operations similarly will not require any significant earthwork that would alter the slopes. With proper precaution, we believe the planned tree felling associated with the new transmission lines and access road will have minimal effect on the stability of the slopes within the project site.

We do not believe there is any slope stability concerns (or similar hazards) associated with development of the substation.

Our work was done in accordance with generally accepted soil and geotechnical engineering practices. No other warranty, expressed or implied, is made. The conclusions provided herein are only appropriate for the subject property, and are based on site observations and explorations documented in the reports noted herein.

It has been a pleasure assisting you with this phase of the project. Please do not hesitate to call if you have any questions or require further assistance.