

## SECTION 1. GENERAL

This report presents the results of our geotechnical engineering analyses for the *Pali Highway Resurfacing* project from Vineyard Boulevard to Waokanaka Street in Honolulu on the Island of Oahu, Hawaii. The project location and general vicinity are shown on the Project Location Map, Plate 1.

This report summarizes the findings from our field exploration and laboratory testing, and presents our geotechnical recommendations derived from our analyses for the design of pavement rehabilitation and/or reconstruction, and traffic signal pole foundations. The findings and recommendations presented herein are subject to the limitations noted at the end of this report.

### **1.1 Project Considerations**

The highway pavement rehabilitation project is along Pali Highway (Hawaii Route 61) between Vineyard Boulevard [Sta. 12+44 or Mile Post (MP) 0.00] and Waokanaka Street (Sta. 26+88.3 or Mile Post 2.64) in Honolulu on the Island of Oahu, Hawaii. The project encompasses a distance of about 2.7 miles. The approximate limits of the highway pavement rehabilitation project are shown on the General Site Plan, Plate 2.

The existing highway within the project limits is generally a four to five-lane divided highway (two to three lanes of traffic in each direction separated by a concrete/grass median) with turn lanes and pockets that was originally constructed in the 1950s. The purpose of the project is to assess the existing pavement conditions to determine pavement rehabilitation and reconstruction recommendations in accordance with the State of Hawaii – Department of Transportation, Highways Division's (HDOT) requirements.

A pavement condition survey was conducted to evaluate specific areas requiring repair. Special attention was given to the potential presence of near-surface soft and/or loose soils, which may be a contributing factor to the pavement failures observed at some locations of the roadway under consideration. The findings obtained from our field exploration and laboratory testing programs will be used as a basis to formulate geotechnical engineering recommendations for the pavement rehabilitation and/or

reconstruction of the project roadway. Our pavement repair recommendations will be based on the severity of distress, existing pavement thickness, and construction limitations due to the limited working hours on the highway. In addition, we understand that as part of the rehabilitation/reconstruction project, the roadway areas consisting of concrete pavements with asphaltic concrete overlays will be completely removed and reconstructed.

## **1.2 Purpose and Scope**

The purpose of our geotechnical engineering exploration program was to obtain information on the surface and subsurface conditions along the roadway alignment through literature research, past project experience, site reconnaissance, and borehole drilling. The findings and information obtained were used to formulate geotechnical engineering recommendations for the design of pavement rehabilitation and/or reconstruction, and traffic signal pole foundations. The work was performed in general accordance with the scope of services outlined in our revised fee proposal dated January 30, 2018. The scope of our work for this project included the following tasks and work efforts:

1. Research and review of available in-house information along the highway alignment.
2. Reconnaissance and pavement condition survey by our geologist and engineer.
3. Coordination of boring/coring stakeout and utility clearance at the proposed boring/coring locations by our engineer and geologist.
4. Procurement of the necessary excavation permit as required by the State of Hawaii, Department of Transportation.
5. Provision of traffic control during the pavement condition survey and also at the proposed boring/coring locations during our field exploration program.
6. Boring stakeout and coordination with various utility companies for toning of the boring locations.
7. Mobilization and demobilization of a truck-mounted drill rig and operators to and from the project site.

8. Drilling and sampling of 11 borings extending to depths of about 4 to 21.5 feet below the existing ground surface for a total of about 127.8 lineal feet of drilling and sampling.
9. Performance of Dynamic Cone Penetration (DCP) testing at 12 selected locations to correlate the subgrade California Bearing Ratio (CBR) values.
10. Coring of the existing pavement section to depths of about 0.3 to 7.2 feet below the existing ground surface at 20 locations.
11. Restoration of the pavements at the boring/coring locations after completion of the drilling and sampling work.
12. Coordination of the field exploration and logging of the borings/corings by our geologist.
13. Laboratory testing of selected soil samples obtained during the field exploration as an aid in classifying the materials and evaluating their engineering properties.
14. Analyses of field and laboratory data to formulate geotechnical engineering recommendations for the design of pavement rehabilitation and/or reconstruction and traffic signal pole foundations.
15. Preparation of this report summarizing our work on the project and presenting our findings and design recommendations for pavements and traffic signal pole foundations.
16. Coordination of our overall work on the project by our senior engineer.
17. Quality assurance of our work on the project and client/design team consultation by our principal engineer.
18. Miscellaneous work efforts such as drafting, word processing, and clerical support.

Detailed descriptions of our field exploration and the Logs of Borings are presented in Appendix A. Field logs of the DCP tests are included in Appendix B for reference. Results of the laboratory tests performed on selected soil samples are presented in Appendix C. The pavement design and calculations are provided in Appendix D. Photographs of the Asphalt Concrete (AC) cores from the existing pavements are provided in Appendix E. Photographs depicting some of the pavement distresses along the roadway are presented in Appendix F.

---

END OF GENERAL