SECTION 1. GENERAL

This report presents the results of our geotechnical engineering exploration performed for the Kekaulike Avenue, Emergency Repairs at Milepost 8.2, Federal Aid Project No. ER-25(001) project in the Kula area on the Island of Maui, Hawaii. The project location and general vicinity are shown on the Project Location Map, Plate 1.

This report summarizes the findings and geotechnical recommendations resulting from our field exploration, laboratory testing and engineering analyses for the project. These findings and geotechnical recommendations are intended for the design of segmental retaining walls, retaining structures, and site grading only. The findings and recommendations presented herein are subject to the limitations noted at the end of this report.

1.1 Project Considerations

Based on the information provided, the roadway embankment along Kekaulike Avenue, traversing an existing stream channel at approximate milepost (MP) 8.2, experienced moderate to severe damage during the heavy rainstorm on December 13, 2021. It is desired to repair and restore the roadway embankment providing a safe and stable roadway to the public.

The as-built drawings indicate a concrete box culvert about 12 feet high by 6 feet wide and 84 feet long is under the fill embankment, providing the drainage to the stream channel crossing the roadway embankment. The upstream side of the culvert was partially plugged by the runoff debris, although the upper side of the embankment was in relatively sound condition without visible failure and/or distress. The downstream side of the embankment was severely damaged from excessive runoff water overtopping.

Based on a review of the grading plan, we anticipate up to about 20 feet of fill was placed to construct the existing roadway embankment. We anticipate the embankment was constructed several decades ago when fill placements were monitored less and uncontrolled. Therefore, we anticipate hard materials (including but not limited to large cobbles and boulders) and soft/loose zones may be encountered within the existing embankment.

Geotechnical engineering exploration was focused on the characterization of the existing embankment fills in support of the roadway embankment design alternatives. It should be noted that a pavement justification report is not required, considering the new pavement section to match the existing pavement section.

1.2 Purpose and Scope

The purpose of our exploration was to obtain an overview of the surface and subsurface conditions to develop an idealized soil and/or rock data set to formulate geotechnical engineering recommendations for the project. The work was performed in general accordance with our fee proposal dated December 17, 2021. The scope of work for this exploration included the following tasks and work efforts:

1. A site reconnaissance of the project site by our project and principal engineers.
2. Research and review of available in-house soil and geologic information in the vicinity of the project site.
3. Procurement of a Permit to Perform Work Upon State Highways from the State of Hawaii Department of Transportation.
4. Coordination of a Weekly Lane Closure Form and provide public notifications to motorists prior to our field exploration.
5. Coordination of boring stakeout and utility clearance at the proposed boring locations by our geologist.
6. Mobilization and demobilization of a truck-mounted drill rig and two operators from Honolulu to the project site and back.
7. Provision of traffic control and safety devices during our field exploration program.
8. Drilling and sampling of two borings extending to a depth of about 50 feet below the existing ground surface.
9. Coordination of the field exploration and logging of the borings by our logger.
10. Geotechnical laboratory testing of selected samples obtained during the field exploration as an aid in classifying the materials and evaluating their engineering properties.

11. Analyses of the field and laboratory data to formulate geotechnical recommendations for the design of the roadway embankment repair.

12. Attendance of the design meetings in Honolulu via teleconference by our project and principal engineers.

13. Preparation of this report summarizing our work on the project and presenting our findings and recommendations.

14. Coordination of our overall work on the project by our engineer.

15. Quality assurance of our work and client/design team consultation by our principal engineer.

16. Miscellaneous work efforts, such as drafting, word processing, and clerical support.

Detailed descriptions of our field exploration methodology and the Logs of Borings are presented in Appendix A. Results of the laboratory tests performed on selected soil samples and rock cores are presented in Appendix B. Photographs of the core samples retrieved during our field exploration are presented in Appendix C.

END OF GENERAL