GEOTECHNICAL ENGINEERING EXPLORATION

KEKAULIKE AVENUE

EMERGENCY REPAIRS AT MILEPOST 8.2

FEDERAL AID PROJECT NO. ER-25(001)

KULA, MAUI, HAWAII

W.O. 8424-00 MARCH 31, 2022

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Based on the results of our field exploration along Kekaulike Avenue at approximately Milepost 8.2, we encountered the subsurface conditions generally consisting of embankment fills placed over weathered basalt rock. It should be noted that cobbles/boulders and soft/loose pockets were encountered within the embankment fills at Boring No. 1. We did not encounter groundwater in the drilled borings at the time of our field exploration. However, groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

Design alternatives, including soil nail shotcrete retaining walls, the lagging wall with soldier piles and tiebacks, concrete panel wall system, and drilled shaft wall system, were considered. Based on the large boulders exposed in the existing embankment fills, the self-stability concrete panel wall (also known as Tee Wall) system was selected to replace the damaged roadway embankment.

The new concrete panel walls may be considered as a segmental retaining wall system that is capable of installing on the existing embankment fills and tolerating total and differential settlement. In general, the segmental retaining wall system is a composite wall system that utilizes high-density polyethylene or other reinforcing elements to provide an internal stability gravity wall structure system. In addition, segmental retaining walls are also desirable due to the flexibility of the wall, ease of construction, high load carrying capacity, and economy.

We believe that an ultimate bearing capacity of up to 7,500 psf may be used to evaluate the foundation bearing on the existing embankment fills in the extreme limit state. To evaluate the strength limit state of the foundations, bearing pressures of up to 3,750 may be used based on a resistance factor of 0.5. To accommodate the high rainfall environment conditions in the Kula areas, we recommend using Controlled Low-Strength Material (CLSM) as the segmental retaining wall backfill.

Consideration should also be given to densify the subgrade of the segmental retaining wall, using proof rolling by the heavy construction bulldozer. Specific proof rolling construction procedures should be developed during the construction. Geolabs should be retained during construction to assist in developing the procedure and criteria.

The text of this report should be referred to for detailed discussions and specific geotechnical recommendations.

END OF SUMMARY OF FINDINGS AND RECOMMENDATIONS