



Hirata & Associates

Geotechnical
Engineering

Hirata & Associates, Inc.

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December 7, 2018
W.O. 18-6213

Mr. Austen Drake
SSFMI International, Inc.
99 Aupuni Street, Suite 202
Hilo, Hawaii 96720

Dear Mr. Drake:

Our report, "Geotechnical Investigation, Keaau-Pahoa Road Improvements – Route 130, Keaau to Pahoa, Hawaii," dated December 7, 2018, our Work Order 18-6213 is enclosed. This investigation was conducted in general conformance with the scope of services presented in our revised proposal dated March 15, 2018.

The predominant onsite soil underlying the project site was classified as gray, moderately to slightly weathered basalt in a hard and vesicular condition, extending to the maximum depths drilled. The basalt was covered by a relatively thin layer of gravel, ranging from poorly graded gravel with silt and sand to well-graded gravel with sand, in a dense condition. Neither groundwater nor seepage water was encountered in our exploratory borings.

Conventional wall footings founded directly on the medium hard to hard basalt may be used to support the proposed retaining walls. As an alternative, segmental concrete retaining walls founded on a base leveling pad consisting of a minimum 6 inches of imported granular structural fill may be considered. Due to the potential for voids in the basalt stratum, a subsurface probing and grouting program is recommended as part of the site preparation work for foundations.

Additional geotechnical recommendations for the design of retaining walls, flexible pavement, and site grading are presented in this report.

We appreciate this opportunity to be of service. Should you have any questions concerning this report, please feel free to call on us.

Very truly yours,

HIRATA & ASSOCIATES, INC.

Rick I.K. Yoshida

Vice President

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