

July 15, 2011
W.O. 10-4890

Mr. Norman Nagamine
Nagamine Okawa Engineers, Inc.
1003 Bishop Street
Pauahi Tower, Suite 2025
Honolulu, Hawaii 96813



Hirata & Associates

Geotechnical
Engineering

Hirata & Associates, Inc.

99-1433 Koaha Pl
Aiea, HI 96701
tel 808.486.0787
fax 808.486.0870

Dear Mr. Nagamine

**Re: Addendum No. 1 to Foundation Investigation Report
Rehabilitation of Umauma Stream Bridge
Route 19, M.P. 16.02
North Hilo, Hawaii**

L-PILE Ver. 6 was used for our lateral load analysis of the drilled shafts. A soil profile consisting of 28 feet of medium stiff to stiff clay over hard basalt was assumed for drilled shafts at Abutment No. 1 and 38 feet of medium stiff to stiff clay over hard basalt at Abutment No. 2. Soil shear strengths of 1,000 to 1,400 psf were assumed for the clay. In determining the lateral capacity of the drilled shafts in the direction pushed into the slope, soil resistance along the portion of drilled shaft above the existing abutment footings was reduced in computation by using a p-multiplier of 0.1 when considering the potential effects from the passive wedge of the adjacent abutment walls and footings. P-multipliers were used to modify the internal p-y curves generated by the program. Group reduction was included in the analyses using p-multipliers.

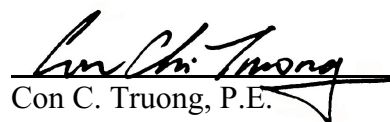
In determining the lateral capacity of the drilled shafts in the direction away from the slope, a sloping ground condition was assumed fronting the drilled shafts. In addition, the portion of drilled shaft above the existing abutment footing elevation was assumed to be unsupported. Group reduction was included in the analyses.

GROUP Ver. 8 was used for our lateral load analysis of the micropiles. A soil profile consisting of 6 feet of clay over hard basalt was assumed for the analysis. A shear strength of 1,400 psf was assumed for the clay. Group reduction was included in the analyses.

Should you have any questions concerning this addendum, please feel free to call on us.

Sincerely,

HIRATA & ASSOCIATES, INC.


Con C. Truong, P.E.