

581

B 9906 011

Chgo

AIEA VILLA SUBDIVISION
SOIL EXPLORATION REPORT

AIEA, EWA, OAHU, HAWAII
TAX MAP KEY: 9-9-10: 4

FOR REFERENCE
not to be taken from this room

TA 710.3
H3
N64
No. 581

To:
PARK ENGINEERING, INC.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

OCTOBER 5, 1973

MUNICIPAL REFERENCE & RECORDS CENTER
City & County of Honolulu
City Hall Annex, 505 King Street
Honolulu, Hawaii 96813

WITHDRAWN

WALTER LUM ASSOCIATES, INC.

CIVIL, STRUCTURAL, SOILS ENGINEERS

3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO

October 5, 1973

PARK ENGINEERING, INC.
1149 Bethel Street, Room 710
Honolulu, Hawaii 96813

Gentlemen:

Subject: Aiea Villa Subdivision
Soil Exploration Report
(for site grading for residential
development)
Aiea, Ewa, Oahu, Hawaii
Tax Map Key: 9-9-10: 4

Transmitted herewith is our soil exploration report for site grading for residential development for the proposed Aiea Villa Subdivision at Aiea, Ewa, Oahu, Hawaii.

This report includes a Boring Location Sketch, boring logs, laboratory test results, recommendations and limitations.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Ezra Koike
Ezra Koike

CM/EK:rmf

C O N T E N T S

	<u>Page</u>
SCOPE OF EXPLORATION	1
FIELD EXPLORATION	1
LABORATORY TESTS	2
GEOLOGIC AND SOIL DESCRIPTION BY OTHERS	2
SOIL CLASSIFICATION SYSTEM	3
GENERAL SITE CONDITIONS	3
INTERPRETATION OF SOIL CONDITIONS	5
DISCUSSION AND RECOMMENDATIONS	6

PROPOSED SPECIFICATION FOR EARTHWORK

APPENDICES:

- A. LOGS OF BORINGS
- B. SUMMARY OF LABORATORY TEST RESULTS - Tables IA and IB
- C. PLASTICITY CHART
- D. CBR TEST
- E. BORING LOCATION SKETCH
- F. PROPOSED BOULDER FILL - Figure 1
- G. SKETCH OF RETAINING WALL BASE CONDITION - Figure 2
- H. LIMITATIONS

AIEA VILLA SUBDIVISION
SOIL EXPLORATION REPORT

AIEA, EWA, OAHU, HAWAII
TAX MAP KEY: 9-9-10: 4

SCOPE OF EXPLORATION

The purpose of this exploration was to evaluate general soil conditions for site grading for residential development for the proposed Aiea Villa Subdivision at Aiea, Ewa, Oahu, Hawaii.

This report includes field explorations, laboratory tests, general recommendations for site grading and residential foundation design considerations and limitations.

FIELD EXPLORATION

Twelve borings were made at the site. The approximate locations of these borings are shown on the Boring Location Sketch. Descriptions of the soils encountered are shown on the boring logs.

Borings were made with 4-in. diameter augers using finger type bits. Soil samples were recovered with a 2-in. standard split spoon sampler driven with a 140-lb hammer falling 30 inches. Rock samples were recovered using a "BX" core barrel with a diamond bit.

LABORATORY TESTS

Laboratory tests included: natural water content, Atterberg limit, expansion and CBR.

GEOLOGIC AND SOIL DESCRIPTION BY OTHERS

Stearns, H. T. and U. S. Geologic Survey, "Geologic and Topographic Map of the Island of Oahu," 1938:

Lower Slopes and Valley Floor

Consolidated, deeply weathered alluvium (Qa)

Upper Slopes

Koolau shield building basalts (Ktb)

U. S. Soil Conservation Service, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii," August 1972:

Lower Slopes

Kawaihapai very stony clay (K1bC: 0 to 15% slope) generally in the central and westerly portions of the lower slopes.

Moderate shrink-swell potential; moderate permeability.

Unified Soil Classification System, "CL-SM".

Upper Slopes

Rockland (r RK).

Top of Slope

Manana silty clay (MpD2: 12 to 25% slope) generally at the entrance to the site along Aiea Heights Drive. Moderate shrink-swell potential. Moderate permeability. Unified Soil Classification System, "MH" soils.

SOIL CLASSIFICATION SYSTEM

Soil samples were visually observed and subjected to appropriate tests in the laboratory. Based on visual observations and laboratory tests, the soil descriptions on the boring logs are generally made in accordance with the "Unified Soil Classification System."

GENERAL SITE CONDITIONS

Site Location

The proposed site is located in a valley (Aiea Heights Gulch) between Aiea Heights and Halawa Heights, approximately one-half mile mauka (northeast) of the Aiea Sugar Mill in Aiea, Ewa, Oahu, Hawaii.

Size

The area of the proposed site is about 35.6 acres.

Access to the Site

At the present time, the site is accessible from Aiea Heights Drive from the northwest side of the site and down along Aiea Gulch Access Road to the valley floor or project site.

Annual Rainfall

The average rainfall at the proposed site may vary from about 40 to 50 inches.

Topography

Aiea Stream runs down the middle of the valley and thru the project site in a westerly direction at an average slope of about 4%. The stream bank is about 8 to 15 ft high lined with a natural deposit of boulders.

The project site slopes upward from the stream bed. The lower slopes next to the stream bed vary from about 10 to 25%. The upper slopes are steep and vary from 40 to 75%.

Lower slopes

The lower slopes in the central and westerly portions of the site are somewhat flatter (10 to 25%) than the easterly end up the valley.

The lower slopes are overgrown mostly with grass and interspersed with a few trees.

Boulders were scattered on the surface of the site.

Upper slopes

The upper slopes on both sides of the valley are generally steep, 40 to 75% slopes and steeper in localized areas.

Exposed rock outcrops may be noted along the slopes.

The slopes are partly covered with trees and shrubs.

Aiea Gulch Access Road is on a bench cut into the side slopes on the Aiea Heights side of the valley.

Access trails appear to have been cut into the slopes on the Halawa Heights side of the valley for Hawaiian Electric power lines.

A stockpile of soil was placed on the low area near the central portion of the site at the time of the field exploration.

INTERPRETATION OF SOIL CONDITIONS

From the field exploration and laboratory test results, the soils encountered in the borings may be generally approximated as follows:

Lower Slopes (Along Aiea Stream)

Stiff "CH" clays and "MH" silty clays with cobbles and boulders to 8 to 16 ft, the depths drilled.

Upper Slopes (Valley Slopes)

A surface layer, one to 14 ft, of stiff "MH" silty clay and clayey silts and "CH" clays underlain by decomposed rock and lava rock to 6 to 24 ft, the depths drilled.

Rock outcrops were noted in various areas of the site.

Water was not noted in the borings at the time of the field explorations.

Variations to the above soil conditions are to be expected in localized areas. For more detailed descriptions of soils encountered in the drill holes, refer to the boring logs.

DISCUSSION AND RECOMMENDATIONS

In general, the plan is to improve the entryway into the subdivision at Aiea Heights Drive and widen Aiea Gulch Access Road; realign and channelize Aiea Stream thru the lower portion of the site; and clear and grade the lower portion of the site for residential lots.

For the improvement of Aiea Gulch Access Road, fills of about 22 ft in height, side slopes at about 1-1/2 horizontal to 1 vertical, and retaining walls along the lower portion of the fill are contemplated.

Cuts up to about 20 ft in height are contemplated. Some of the cut may be through decomposed rock or lava rock.

Adobe (CH) clays were noted in several of the borings, mostly in the lower areas along the stream.

Before the construction of fills over drainageways, the natural channels should be drained and subdrains installed. Some settlement of the fills over the drainageways may be anticipated. Settlement gages should be installed to monitor the performance of fills. After allowing the ground to settle for as long as practicable or when settlement gages show tolerable rates of settlements, building construction may proceed over the compacted fill.

Site Grading

Grading of the site, particularly the construction of fills, should be done prior to building construction to allow the underlying soils as much time as practicable to adjust to the new load experience.

Grading work should be done in accordance with the requirements of the Revised Ordinances of Honolulu, 1969 As Amended; and as recommended below:

1. The area should be cleared and grubbed.

Surface vegetation and miscellaneous debris

should be cleared and removed prior to site filling.

2. Loose surface soils should be stripped to stiff natural ground before the placement of fills. Loose surface soils at finish grade should be scarified and recompactd.

Loose surface and fine-grained soils should be stripped down to residual material. The stripping, when practicable should extend down to rocklike material below the wall. Stripping should extend about 10 ft behind the wall on the uphill side under the access roadway.

3. Where fills are proposed on sidehill areas, gullies and natural drainageways, loose material at the bottom and sides should be stripped down to stiff natural ground before the placement of fills.

Subdrains should be placed along the bottom of natural drainageways with laterals in a herringbone pattern along the sides of the drainageways.

4. Localized soft pockets encountered during the site preparation should be excavated and replaced with compacted select material.
5. In fill areas, clay "CH" (adobe) soils should be kept 2 ft below finish grade and away from retaining walls and slopes.
6. Select granular material should be used to construct the Aiea Gulch Access Roadway fill. The select material should be fairly well-graded, less than 3-in. size, less than 15% passing No. 200 sieve, and plasticity index less than 10.
7. Thin sidehill fills (sliver fills) on sloping areas should be avoided, if practicable.
8. Fills should be constructed in approximately level layers starting at the lower end and working upward. Where fills are made on sloping areas steeper than about 5 horizontal to 1 vertical, the ground at the toe of the fill should be benched to a generally level